

Cardiff University

Nurses' emotions and oral care for hospitalised adults

This thesis is being submitted in partial fulfilment of the  
requirements for the degree of Doctor of Philosophy

September 2013



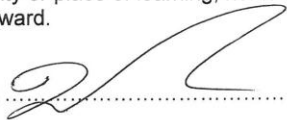
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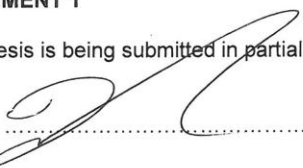
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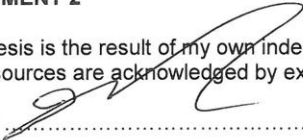
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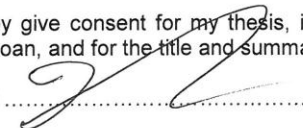
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# Acknowledgements

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There are many people who have given me their time and support during this extraordinary journey. I will be eternally grateful to each of them.

Firstly, I would like to express my sincere and wholehearted thanks to Professor Elizabeth Treasure who has been an inspiring, patient and supportive supervisor. Thank you for helping me to pick myself up and keep going.

I must also thank Professor Andrew Smith for his steady guidance and extraordinary wisdom, which has helped me to develop my research within a new discipline.

I would like to acknowledge the people who have provided their time, advice and help with this research. In particular, the staff and students at the University of Glamorgan, Cardiff University's Schools of Nursing, Dentistry and Psychology and the staff at Cardiff and Vale Hospitals Trust. I must also thank Professor Andrew Lawrence who kindly gave me his time to provide advice for psychological tests.

I acknowledge and express my gratitude to the Royal College of Physicians and Surgeons of Glasgow for the T.C. White award. This funding allowed me to conduct the mixed methods pilots and studies.

In addition, I must express my sincere appreciation to the people who have helped and supported me during this journey. I am grateful to Professor Ivor Chestnutt, for his constant support and expert guidance throughout my academic training. I am also indebted to my colleagues at Cardiff University,

Public Health Wales and the Welsh Government who have been there for the good times and the bad.

Finally, I would like to express my most sincere thanks to my family. I am truly grateful for my fabulous husband, who has lived this experience with me. I am also thankful for my wonderful children, who have patiently shared their time with this thesis. I would like to also thank my mother and my late father for inspiring me to always reach further than I ever thought would be possible.

*Dedication*

*This is dedicated to*

*Chad, Hugh, Gabriella, Lynn, Neil and Scott.*

# Abstract

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**Background:** It is reported that hospitalised adults require daily oral care to prevent respiratory infections and maintain oral health but patient oral health declines in hospital. Enhancing knowledge and attitudes has not proven effective for changing behaviours or improving oral health. Reports suggest that some nurses find providing oral care unpleasant, therefore, emotions may influence care provision. **Aim:** To understand how nurses' and student nurses' emotional experiences and reactions influence the provision of oral care for hospitalised adult patients. **Methods:** The initial study explored emotional experiences, reactions and oral care practices. Eight focus groups and ten one-to-one semi-structured interviews with 48 subjects were used to collect data. These were analysed with Grounded Theory. A second study developed and tested methods to measure student nurses' emotions towards oral care. This used a self-report questionnaire, interviews and Stroop tests. In the final study, 248 student nurses completed a revised self-report questionnaire, a disgust sensitivity questionnaire and two oral care attitude measures; 41 participants additionally completed emotional Stroop tests, implicit association tests and interviews. Qualitative data were analysed with thematic analysis. X<sup>2</sup> tests, correlations, and Principal Component Analysis were used to analyse quantitative data. **Results:** Nurses and student nurses experience emotions towards the social, moral and physical aspects of providing oral care; emotions vary with different situations. Unclean mouths are associated with unpleasantness. Failure to provide oral care evokes moral disgust and anxiety. Providing oral care can evoke anxiety and disgust in unpleasant situations, this leads to student nurses reporting altering oral care procedures. **Conclusions:** Nurses' and student nurses' emotions of disgust and anxiety influence oral care. Although these emotions can motivate nurses to provide care, anxiety and disgust can lead to the selection of procedures that avoid aspects of oral care thus reducing the quality of care provided. Nurses' oral care training programmes need to address these emotions to improve the quality of oral care for patients in hospitals.

# Chapter 1

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## 1. Literature Review

### 1.1. Introduction

This literature review is divided into four sections. The first explores oral health and oral care, it then examines how oral care can contribute to oral and general health; it concludes with an overview of oral health care needs in hospitals. The second section outlines methods used to improve oral care for patients. It also considers training and interventions for nurses and care staff, and explains limitations of current approaches to improving oral health. The third section examines how nurses' emotions are relevant to oral care. This commences with theories of the nature and purpose of emotions. Emotions and attitudes towards interactions with the mouth and oral care are outlined leading to an examination of relationships between emotional anxiety, disgust, contamination and social violation. Evidence suggesting that oral care is an unpleasant and difficult experience for nurses is then presented. This section concludes with a summary setting out the potential role of emotion in oral care. The final section examines the capture and measurement of emotions.

#### **Search strategy**

Search strategies were developed in Ovid Medline (Wolters Kluwer Health, 2013) to the present using subject MESH subject headings and keywords (Appendix 1.1). Searches were then constructed in PsycINFO, EMBASE and the British Nursing Index and Archive databases. Articles retrieved were used to identify further search terms and authors. They were also used for citation tracking for additional literature.

Literature searches were kept up to date using electronic email notifications in Ovid Medline (Wolters Kluwer Health, 2013) and Zetoc (Zetoc Minmas, 2013).

### **1.1.1. Oral care and oral health**

The term oral care is used to describe oral hygiene procedures that remove dental plaque and debris from the mouth. It is considered that “effective removal of dental plaque is essential to dental and periodontal health throughout life” (Lang et al., 1999, cited in Bimstein et al., 1999) preventing gingivitis, periodontal conditions and dental caries (Axelsson and Lindhe, 1978).

Records of oral hygiene care procedures date as far back as 3500 B.C (Campbell, 1952) and procedures reportedly vary across cultures (Butani et al., 2008). Oral care can form part of ritual and religious activities (Bos, 1993, Al Sadhan and Almas, 1999), however the main purpose of oral care is oral health.

### **1.1.2. Oral health**

Oral care is reported to improve oral health but the meaning and measurement of ‘oral health’ remains subject to considerable debate (Leao and Sheiham, 1996, Slade et al., 1998, Sischo and Broder, 2011). Oral health is generally considered to be more than the absence of disease and therefore measuring oral health involves measuring a wide range of indicators beyond disease. The Oral Health Strategy Group for England (1994) has defined ‘oral health’ as:

“A standard of health of the oral and related tissues which enables an individual to eat, speak, socialise without active disease, discomfort or embarrassment which contributes to general well-being”.

This definition presents a broad view of oral health taking account of social impacts. These impacts include pain, comfort, chewing, eating, talking, smiling, laughing, difficulty relaxing, embarrassment, (Cohen and Jago, 1976, Nikias et al., 1979, Leao and Sheiham, 1996, Locker and Allen, 2007), self esteem and body image (Price, 1979). The relationship between oral care and oral health is not fully understood, and there is little evidence to show which oral care procedures and frequencies achieve this wider view of

oral health. In view of this, recommended frequencies for oral care are based upon disease prevention.

### **Oral care**

Oral care can be self-performed by patients or provided for patients as assisted personal care. In addition, professional oral care can be delivered to patients in hospitals. Oral care is considered to contribute to the prevention of oral disease in two main ways, firstly by mechanically removing plaque and debris and secondly by delivering topical prevention, for example, fluoride toothpaste.

### **Mechanical plaque removal**

Frequent mechanical removal of plaque is important for gingival health and the prevention of periodontal disease (Axelsson and Lindhe, 1978, Axelsson and Lindhe, 1981). Lang et al. (1973) showed that effective self-performed tooth brushing at 48 hour intervals prevented gingival inflammation while Bellini et al. (1981) demonstrated that to be effective at preventing inflammation, oral debris should be removed on a daily basis. Although the evidence from these studies was based on compliant, self-caring adults, many of whom were dental students, these studies suggest that the minimum frequency of care to maintain gingival health is between 24 and 48 hours. These frequencies are based upon one episode of effective oral care in healthy adults.

Toothbrushing is widely considered to be the best method for cleaning teeth and Cochrane reviews have shown that both powered and manual toothbrushing remove dental plaque but the relative merits of different types of toothbrushes for this over time remain inconclusive (Robinson et al., 2005, Deacon et al., 2010). A number of factors are reported to affect oral hygiene care which include: compliance with care procedures, dexterity, social circumstances, oral health and general health (Addy et al., 1990, Robinson et al., 2005). Van Der Weijden and Hioe (2005) concluded, in a systematic review, that adults with gingivitis do not self-perform oral care effectively. Brushing techniques can be ineffective and it is also possible that adults

choose to use alternative methods of cleansing instead of brushing, for example mouthwashes that are less efficient for care. This means that adult self-performed oral care can be ineffective.

As many adults do not perform effective oral care in a single episode of self-care. It is generally recommended that healthy adults brush their teeth twice a day in order to ensure that plaque is removed from all areas at least once per day. It is probable that more frequent cleaning may be required for older patients in hospitals who are at greater risk of general health conditions such as dementia which affect the ability to carry out oral care (Arai et al., 2003).

Mechanical plaque removal is also recommended for partially dentate and edentulous individuals to improve the condition of the soft tissues in the mouth. In an epidemiological study, Nevalainen et al. (1997), found that adults who reported cleansing their oral tissues had fewer oral lesions of Candida associated conditions such as angular cheilitis and less tissue inflammation below dentures. Baran and Nalcaci (2008), agreed with this finding in a clinical study which showed that self-reported oral hygiene habits were associated with the condition of oral tissues. Although these studies illustrate positive benefits to the oral tissues from oral care, these studies were based on self-report. Adult Dental Health Survey examination findings showed 64% of adults who reported cleaning their teeth twice per day and 94% of those reporting cleaning once per day had visible plaque on their teeth (Chadwick et al., 2011). This suggests that self-report may not provide the best measure for oral care efficacy and, studies associating self-reported oral care with improvements in oral soft tissue condition tissue may be affected by sub-optimal oral care efficacy. It is therefore possible there may be greater benefits to oral soft tissue health than presently reported if care is carried out effectively.

### **Topical Fluoride**

Toothbrushing can be used to deliver fluoride to the teeth and epidemiological evidence from Adult Dental Health surveys in the UK indicates that people who report brushing twice per day have a lower prevalence of dental decay (White et al., 2011). There is also evidence to



suggest that fluoride toothpastes prevent dental caries in adult populations, for example, Chadwick et al. (2011) demonstrated that the application of fluoride to carious lesions in the adult mouth could stop or reverse the progression of disease. The literature relating to prevention for middle aged and older adults is less developed but evidence suggests that toothbrushing can provide additional benefits for specific adult populations. For example, the majority of people aged 75 and over take medication (Chen et al., 2001); these medications (Narhi et al., 1992) and conditions such as rheumatoid arthritis (Von Bültzingslöwen et al., 2007), are linked to a dry mouth condition called xerostomia. This is uncomfortable (Guggenheimer and Moore, 2003) and the lack of protection from saliva can also increase the risk of dental caries (Pedersen et al., 2005). Regular fluoride toothpaste use is therefore considered beneficial for people with xerostomia to help reverse and protect against dental caries.

This evidence therefore suggests that toothbrushing and oral care on a regular basis may provide both cleanliness and help prevent dental caries in adults and may be of particular benefit to the elderly and infirm.

### **Self-performed oral care**

Procedures for self-care have been described in the literature (Bakdash, 1995, Choo et al., 2001); techniques include toothbrushing, interdental cleaning and the use of mouthrinses. Although there is limited evidence for best practice in different population groups, each of these reviews reach similar conclusions, advocating the use of tooth brushing for self-performed oral care.

### **Assisted oral care**

Nursing guidelines clearly state that nurses have a role in supporting oral care for patients in hospitals (Department of Health, 2003, Welsh Assembly Government, 2003), this includes a range of activities. Nurses can provide support for patients who are able to undertake self-performed oral care, for example, by giving patients oral hygiene equipment or reminding patients to

clean their teeth. Nurses and carers can also provide some or all oral hygiene procedures for adults who cannot self-care.

Oral hygiene practices and procedures for the provision of assisted oral care have been considered in a number of reviews (Bowsher et al., 1990, O'Reilly, 2003, Berry and Davidson, 2006) which focussed on nurse provided oral care. As with self-performed oral care, these reviews have recommended the use of toothbrushes for patient care. However, patients in hospital can be unwell, predisposing them to oral health problems (Terezakis et al., 2011). Evidence to support the frequency of oral care is less established and oral care frequencies in hospital can vary (Grap et al., 2003). Available guidelines (Cutler and Davis, 2005, Berry et al., 2011) recommend that oral care is carried out twice per day and more frequently when clinically indicated.

### **Professional oral care**

Oral care is also used to describe dental cleaning treatments, such as scaling and polishing, administered exclusively by dental professionals. Professional dental care is provided less frequently in care establishments than daily self-performed or assisted cleaning but Abe et al. (2001, 2006) and Adachi et al. (2002) demonstrated that professional oral care can reduce oral disease and decrease oral bacteria and yeasts. Although potentially beneficial to patients in care establishments, Peltola et al. (2007) and Ueda et al. (2003) showed that where professional oral care is provided for patients, frequent daily oral care, for example toothbrushing, is still needed to prevent oral disease.

Hence although professional oral care can be an adjunct to care, patients in hospitals need regular self-performed oral care or assisted oral care at regular intervals for their oral health (Power, 1990).

### **1.1.3. Oral care and general health**

Oral care contributes to general health by preventing painful oral conditions, which may affect oral function. Oral health problems have been associated

with a reduction in the variety of foods that are eaten (Sheiham et al., 1999), poor nutrition (Ritchie et al., 2002) and low body weight in adult populations (Mojon et al., 1999). As most of these associations are based upon observational and epidemiological evidence, these associations may also be due to an increased likelihood of oral health problems in patients with poor nutritional intake. Although it is possible that oral care may not improve dietary intake, all of the evidence does point to a relationship between oral health and diet, furthermore, oral care does help to prevent conditions, for example candida (Grimoud et al., 2005) that can affect healthy dietary intake (Paillaud et al., 2004). This evidence therefore suggests that oral care may contribute to improved nutrition and health.

#### **1.1.4. Oral care for health in hospitalised patients**

Observational studies (Munro et al., 2006) and randomised controlled trials (Fourrier et al., 2000) have associated oral care with respiratory disease prevention. In agreement with this, there is also evidence in literature (Fourrier et al., 2000, Scannapieco et al., 2003, Munro et al., 2006) and systematic reviews (Azarpazhooh and Leake, 2006, Sjogren et al., 2008), suggesting that the risk of respiratory diseases in older adult populations is reduced by oral care. These studies estimate that between two and 16 elderly people would need to receive oral care in intensive care for one respiratory infection to be prevented (Azarpazhooh and Leake, 2006, Sjogren et al., 2008). These systematic reviews however combined the larger body of evidence from a number of randomised controlled trials in intensive care wards with sparse evidence from care homes and no evidence from other hospital wards, so additional evidence would help expand on this association.

The majority of studies relating to the role of oral care in hospitals focus on Ventilator Associated Pneumonia (VAP), which is a common hospital respiratory infection affecting between 10% and 65% of patients in Intensive Care Units (ICU) (Elatrous et al., 1996, Cook et al., 1998, Fagon et al., 2000, Rello et al., 2002). This infection has been shown to cause health

complications and death (Kollef, 1993) in up to 28% of the patients in ICU (Fagon et al., 1993). Treatment of VAP requires considerable resources and following a review of the evidence (Jones et al., 2007), the National Institute for Health and Clinical Excellence (NICE) in 2008 identified oral care within a “care bundle” as a high impact intervention for the prevention of VAP (National Institute of Health and Clinical Excellence, 2008).

Adding oral care to a care bundle for patients reduced the incidence of VAP in an American ICU before and after study (Abbott et al., 2006). Fields (2008), in a single randomised controlled trial also found improved VAP rates in an American Neurological ICU. In this study, the intervention involved 8 hourly oral care as part of a care bundle whilst the control group received no oral care. Patients allocated to the intervention group maintained VAP rates of 0% per 1000 ventilator days and the trial was stopped at six months when it became evident that the control group had higher VAP rates. This evidence supports the preventative role of oral care.

Field’s study highlighted the issue of nurses’ compliance implementation in these studies. Of the 4000 days of care, nurses documented less than half in the care notes. On investigation nurses reported being too busy or not remembering to write in the notes. Compliance has not been addressed in the majority of oral care studies and the true frequency of oral care on wards is not well reported in the literature. It is therefore possible that health benefits from oral care are underestimated in studies with poor compliance.

Henderson (1960) stated, "In fact the condition of the mouth is one of the best indices of the quality of nursing care". As good general nursing care may reduce other potential sources of infection (Cason et al., 2007) it is difficult to separate the benefits of oral care in hospitals from overall nursing care.

This evidence shows that oral care should be carried out on a frequent basis in hospitals for oral and general health. There is no clear evidence to outline the optimal frequencies of oral care required to maintain oral and general health for patients in hospitals but there is evidence that oral care, ideally using toothbrushes, should be carried out twice a day or more to prevent oral

disease. This thesis will be based upon existing literature and guidelines which recommend that nurses and care staff in hospitals ensure that adults receive self-provided or assisted oral care using toothbrushes two or more times per day.

#### **1.1.5. Population demographics and oral care needs in hospitals**

The UK population is ageing (ONS, 2007) and these changing demographics have implications for oral health and care in hospitals and care establishments. In 2011/12, 90% of admissions were for people over the age of 15, and 41% of admissions to hospital in Wales were for adults over the age of 65 (Ritchie et al., 2002).

##### **Increases in oral health problems with age**

The population is ageing and studies have shown that older adults have an increased risk of oral (Russell and Ship, 2008) and medical health problems (ONS, 2006). Longitudinal studies have shown a decline in oral health with age in care home populations, with a high proportion of the population at risk of problems (Samson et al., 2008). Although little evidence is available for the impact of an aging population on oral health needs in hospitals, studies suggest hospitalised older adults have greater oral health needs than their free living peers (Pajukoski et al., 1999). This evidence indicates that many people in hospitals are at risk of oral health problems and these numbers will increase with an ageing population.

##### **Capacity to maintain oral health**

With age, older adults can become less effective at self-provided oral care (Arpin et al., 2008) and American surveys have shown an increasing need for help with self-performed care amongst care home residents (Sahyoun et al., 2001). These trends may be explained by debility and a reduced capacity to self-perform oral care with age (Nordenram and Ljunggren, 2002, Arai et al., 2003, Ruiz-Medina et al., 2005). The reduced capacity to self-perform care may also relate to the prevalence of specific disabling

conditions that are common in older adults. For example, Hunter et al. (2006) found patients with functional disability in the hand following a stroke reported difficulty in cleaning their teeth. These self-reports were corroborated clinically in a care home study which found that residents with less function in their hands had poorer oral hygiene (Padilha et al., 2007). It has also been suggested that conditions such as stroke may also affect oral hygiene because of residual sensory deficits (Leung et al., 2002). These may affect a person's ability to evaluate their own oral cavity (Chávez and Ship, 2000).

A decline in cognitive function is also associated with age and this is considered to affect oral health (Nordenram and Ljunggren, 2002). Following a review of 306 articles Chalmers and Pearson (2005), concluded that care home residents with concurrent physical and cognitive decline were at greater risk of poor oral health. A range of health conditions therefore affect the capacity to self-care.

These studies indicate a high prevalence of conditions that can predispose individuals to oral health conditions and preclude self-performed care in care home residents. The lack of capacity to self-care may be underestimated as people with severe physical and cognitive decline are often excluded from studies. Few studies have considered patient capacity to self-perform oral care or the need for assisted oral care in hospital settings. As care home residents are more likely to be admitted to hospital than free living older adults (Bardsley et al., 2012) this suggests that on admission, a high proportion of patients in stroke care, elderly care and medical wards in hospitals will have long term conditions, oral health problems and a need for assistance with oral care.

#### **1.1.6. Demand and need for assistance with oral care in adults**

A clinical need for assistance with oral care does not relate to demand from patients. Evidence indicates that care home residents who need care do not use dental services (Fiske et al., 1990a, Hawkins, 1999, Hunter et al., 2006);

those most affected by disability and illness are least likely to seek help. This lack of demand agrees with another care home study which found that oral problems were only identified when residents complained of problems (Ekelund, 1989). Wardh et al. (2002b) reported in a study of care homes, that residents showed little concern about their oral care. Recent evidence from the care home surveys in Wales has indicated that a lack of demand for care persists in this population (Morgan et al., 2012).

Despite a lack of demand, there is still a perceived need for dental treatment amongst older people and one study of homebound older adults with disabilities found that when asked, people with the greatest disability felt that they needed dental treatment (Lester et al., 1998). Lack of demand for treatment and care may be because of low expectations and one study of denture patients demonstrated that older adults were resigned to and expected discomfort from their mouths (Mojon and MacEntee, 1992). It is also possible that those with a need for professional dental care may have had negative experiences in the past (Fiske et al., 1990b) or a diminished desire for personal care through tiredness or dependence on others to provide care (Avlund et al., 2001).

Oral care failings may also relate to how staff respond to patient demands. A small study in Hertfordshire found that only a small proportion of care home residents (51/164) reported being able to clean their mouth on a daily basis (Simons et al., 2001). Of those who were unable to clean their teeth, 57 reported requesting help but only six received it. In view of this, a lack of demand for dental treatment in combination with a lack of response to care demands from this population attributable to both residents and carers may explain why care is not provided.

Oral care can therefore contribute to oral and general health and the need for oral care is rising in care establishments and hospitals. There is evidence to suggest that these increasing oral care needs are not being met. Nursing and care staff need to be able to deliver frequent and effective oral care that meets the needs of their patients. This includes addressing the gap between demand and care. Nurses have a defined role in the delivery of oral care for

hospitalised patients and so methods and training for nurses to improve the quality of oral care for patients will now be considered.



## **1.2. Methods used to improve oral care**

### **1.2.1. Introduction**

This section of the literature review considers methods used to improve oral care, and focuses on nurses and carers. Training interventions to improve oral care and their effects on staff and patients are explored. Interventions to improve oral health in hospitals and care institutions and the residual gaps in the delivery of care are then examined. This leads into the final section of the literature review.

### **1.2.2. Knowledge and education for oral care**

Nurses have a role in ensuring oral care for their patients however poor and ineffective oral care practices exist. These have been identified through semi-structured questionnaires of staff in rehabilitation wards (Preston et al., 2006) and poor practices are acknowledged as a barrier to good oral care for patients (Daniel et al., 2004). A lack of training was considered by Frenkel (1999) to be a contributory factor to clinically inappropriate oral hygiene practices found in an observational study of oral care in care homes. Training and knowledge are therefore relevant to the delivery of patient oral care.

Power (1990), in a nursing review of oral care, suggested that that care staff do not have sufficient knowledge to perceive the need for oral care. This may be because oral health knowledge varies amongst nurses and studies have shown inconsistencies in nurse training (Longhurst, 1998). It is reported that some nurses do not learn oral care during their training (Jones et al., 2004). The literature also suggests that there is a lack of comprehensive oral care information in nursing textbooks (Longhurst, 1998) and inadequate specialist knowledge and training in areas such as oral care for patients with cancer (Southern, 2007).

Without formal training, nurses can rely on inadequate self-care practices as a basis for care and Kaz and Schuchman (1988) in a small study of nursing assistants working in care facilities found that poor self-care practices were associated with inferior oral care for patients. In addition, there is evidence from a small study to suggest that oral care habits may affect oral care practices in health care workers (Zadik et al., 2008). This evidence is corroborated by Ashkenazi et al. (2012) who found that care staff with better oral hygiene habits provided better oral care for their dependent patients. Furthermore, it is also suggested that without adequate knowledge, nurses' care is focussed on alleviating patients' symptoms rather than identifying and preventing oral health problems (Walid et al., 2004). Training is therefore important for patient oral care.

A number of studies and reviews (Rak and Warren, 1990, Fitzpatrick, 2000, Isaksson et al., 2000, Preston et al., 2000, Charteris and Kinsella, 2001, Wilkin, 2002, Costello and Coyne, 2008) have concluded that non-dental health care professionals require training or feel the need for training in oral care, to improve their oral health knowledge, and change poor practices (Kite, 1995, Curzio and McCowan, 2000). This need for "knowledge about oral health" was also identified amongst nursing managers in a qualitative investigation (Paulsson et al., 1999). In agreement with this, Paulsson et al. (2001), in a grounded theory based study, also identified themes of knowledge and education as important for patient care in long term facilities. Further small scale questionnaire based studies have also highlighted poor knowledge of oral disease and oral health amongst care staff as being an issue for care (Rak and Warren, 1990, Thean et al., 2007).

Rudolph and Ogunbodede (1999) found nurses' knowledge and oral health behaviours for their patients were correlated. In a further study of 225 care providers in Belgium, Vanobbergen and De Visschere (2005), extended this understanding and found that the strongest predictor for oral care was oral health knowledge. In this study, 70% of oral health care practices could not be predicted and Rudolph and Ogunbodede's study also showed similar

limitations. These findings suggest that knowledge may be important but may have a complex relationship with oral care.

### **1.2.3. Oral health knowledge**

Blank et al. (1996) and Kaiser et al. (2000) surveyed dental knowledge in care homes and found that health care worker (HCW) knowledge was greater following training. Kaiser also demonstrated that oral care knowledge could be retained for at least 6 months, although the study was small, with only 31 participants. Paulsson et al. (2001), in a larger study, involving 950 participants also demonstrated improvements in knowledge and attitudes amongst care home HCWs, three years after an educational programme which involved four one hour training sessions. Although the findings were positive, the study had a response rate of 67% and may have been at risk of responder bias.

Simons et al. (2000) found similar increases in knowledge after training amongst 37 care staff working in care homes but this study also showed no improvements in residents' oral hygiene. This lack of improvement was attributed to high staff turnover in the care homes that received training. This indicates that even when acceptable, training may not deliver improvements for patient oral health and this may relate to the care environment.

### **1.2.4. Care environments**

A failure to provide oral care is often attributed to nurses and carers, but the structure and organisation of the care environment cannot be separated from the delivery of oral care for patients. Care environments can be an additional barrier to care, as a result of organizational culture (Thorne et al., 2001, Vanobbergen and De Visschere, 2005), lack of equipment and time constraints (Johnson and Lange, 1999, Pyle et al., 1999, Coleman, 2002, Furr et al., 2004). Training can help nurses and carers address these barriers.

### **1.2.5. Training programmes in oral care**

Training for nurses and carers is reported to deliver knowledge and skills and is frequently recommended in oral care studies (Blank et al., 1996, Chalmers et al., 1996, Binkley et al., 2004, Wardh et al., 2012). There is evidence from a study of ICU to indicate that nurses report needing further training in oral care (Binkley et al., 2004). When oral care training is provided, studies show that it is often reported as being well received (Pyle et al., 1998, Simons et al., 2000, Frenkel et al., 2002).

Although studies have advocated training for oral care, few have explained how to deliver this, and Holmes (1998) acknowledged that it is difficult to identify effective methods, techniques and training for oral care.

A number of training programmes have aimed at improving nurses and HCWs' oral care knowledge and behaviours. These used lectures and presentations to teach the consequences of dental care neglect and techniques for cleaning teeth and dentures and many have combined these with another form of teaching, for example demonstrations or practical hands-on training (Glassman et al., 1994, Mojon et al., 1998, Paulsson et al., 1998, Pyle et al., 1998, Vigild et al., 1998, Budtz-Jorgensen et al., 2000, Isaksson et al., 2000, Kaiser et al., 2000, Simons et al., 2000, Sweeney et al., 2000, Frenkel et al., 2001, Meurman et al., 2001, Chalmers et al., 2005, Glassman and Miller, 2006, Reed et al., 2006, Wyatt et al., 2006, MacEntee et al., 2007, Peltola et al., 2007, Shimoyama et al., 2007, Kullberg et al., 2009, Munoz et al., 2009, Samson et al., 2009).

### **1.2.6. Oral care training and oral assessments**

Blank et al. (1996) in a study also reported by Kayser-Jones et al. (1995) found that a 30 minute training lecture improved the quality of nurses' oral health assessments in a cohort of 18 participants. Arvidson-Bufano et al. (1996), also demonstrated that training could improve the accuracy of oral assessments using a newly developed tool. These short term studies agree with Wyatt (2009) which followed the progress of 139 elderly residents over

five years. This study found that oral care assessments, which also ensured that residents accessed dental treatment, improved the residents' oral health over a five-year period. Improvement however declined over the duration of the study, which suggests that these interventions may only work for a limited duration.

Although this evidence suggests that training may help nurses to use assessment tools, Ettinger et al. (2000) found that of 428 nursing home directors of whom 66% had received oral care training, only 9% felt that oral health assessments were useful in the identification of patients' needs. This suggests that not all training for oral care assessments is accepted.

Oral care assessments and training have also been studied in hospital intensive care units. Fitch et al. (1999), in a longitudinal study, monitored the effects of training nurses to use oral health assessments and protocols. Patient oral health was improved using this regime, but not all patients benefited. It is unclear how many nurses participating were compliant in providing oral care but this study suggests that not all nurses responded to training. Further studies in intensive care (Treloar and Stechmiller, 1995, Wyatt, 2009) also demonstrated similar improvements in patients' oral health but also found that despite using oral assessments, nurses can still experience difficulties with patients' unwillingness and inability to co-operate with oral care.

Guidelines were introduced in one small study (Ross and Crumpler, 2007) in ICU to improve nurses' compliance with oral care; improvements in the patients' oral health and VAP rates were seen. Another study in ICU Abbott et al. (2006) tested the use of guidelines, oral assessments and training to support the use of these guidelines and again the oral health of patients was seen to improve, although not all patients appeared to benefit. Although the studies are small there appear to be positive benefits to this comprehensive approach to oral care.

### **1.2.7. Guidelines for oral care**

Charteris and Kinsella (2001), in their study of an oral health programme in a hospital neuro-disability unit reported that the implementation of guidelines, training and clinical support had a positive impact on oral health, patient care and how staff experienced oral care. Although improvements to oral health were not demonstrated with validated or objective measures, the study was interesting because the methodological approach involved dealing with issues as they arose. It is therefore difficult to generalise these findings but the findings suggest that guidelines may contribute to oral care.

### **1.2.8. Learning support and priority**

Paulsson et al. (1998) looked at a training intervention but not guidelines in a much larger study involving over 2000 nurses working in long term care. This study used a structured questionnaire based approach and found that, nurses felt a greater sense of priority and greater ability to deal with oral care, following training. Reports did not however detail what priority and ability meant to the nurses. Wardh et al. (2002a) in a qualitative investigation also reported that training and support improved the priority and time given to oral care, suggesting that training may influence how oral care is perceived.

Mojon et al. (1998) found training nurses and carers to provide oral care reduced the amount of specific bacteria in patient mouths. Budtz-Jorgensen et al. (2000) also found a reduction of *Candida* in patients' mouths, following a programme involving carer training and professional oral care. These studies were corroborated by a UK study set in five care homes which found that after training, residents in the homes received more assistance with oral care, had cleaner dentures and a reduction in *Candida* related soft tissue conditions.

Other small scale studies have also found a small amount of improvement in patient oral health and a reduction in patients' oral health needs of patients following training (Pyle et al., 1998, Sumi et al., 2002, Peltola et al., 2007) indicating that nurse training may provide clinical oral health improvement.

Although some studies have shown oral health improvements, some have found no oral health benefits (MacEntee et al., 2007) and some showed no reductions in plaque on the teeth when staff were trained in oral health care (Mojon et al., 1998). This may be because staff adopt some procedures more easily than others. Gammack and Pulisetty (2009) in a before and after study of two nursing homes found that an oral care training programme for staff improved the amount of time spent on oral care. This study did not achieve clinical oral care improvements for patients. Frenkel et al. (2002) also found a lack of improvements after an educational intervention for carers. Although she identified some clinical improvements in denture hygiene following training, she also found that patients' intra-oral dental hygiene remained poor. Nicol et al. (2005) also found similar improvements to Frenkel et al. (2002) following a training programme at five long term care sites, which resulted in clinical improvements of better denture hygiene and improved intra-oral soft tissues amongst patients, but again the improvements predominantly related to extra-oral cleaning of dentures. This indicates that extra-oral cleaning procedures are more readily adopted than intra-oral ones.

The evidence from care homes suggests that training may improve the willingness to provide oral care and denture hygiene for patients however, staff attrition may counteract any benefit. Intra-oral tooth care does not appear to be improved by staff training, which indicates that training may not improve care of the dentate mouth.

### **1.2.9. Comprehensive interventions for oral care**

Matear (1999), in a literature review of oral health advocated that training should be part of an oral health programme indicating that the organisation of training is important for oral care. Furr et al. (2004) extended this suggestion following a questionnaire study of nurses' attitudes towards oral care in ICU and recommended that, as a complex problem, strategies and programmes to improve oral health should use multiple layers of interventions to deal with these issues.

One study of a clinical programme, involving dental treatment, hygienist care and training of nursing home staff in oral care was conducted in a study of 264 nursing home residents in Denmark (Vigild et al., 1998). Improvements in the oral health of residents were seen after one year but over half of the participants were lost during the study. It is therefore possible that as a consequence of the frailty and ill health of the participants, the positive oral health findings were compromised and the loss of the most unwell may have biased the results.

A further programme in a study undertaken over a period of 6 years, tested the impact of a very comprehensive oral health programme on the oral health of residents in a single long term care establishment (Samson et al., 2009). The programme involved a four-hour teaching course for care staff, cards outlining care procedures and a number of other interventions including meetings and reviews of care. Before the implementation of the programme, 36% of the residents had clinically acceptable levels of dental plaque on their teeth but the programme was successful in achieving improvements in oral health and at the end of the study, 70% of residents had acceptable oral health. However, it was not possible to identify which of the interventions included in the programme were most effective. Furthermore, 30% of residents in the study failed to achieve a reasonable state of oral health. The reasons given for this were that patients were too ill, unco-operative, unwilling or were refusing assistance. The HCWs in the study felt that providing oral care for an alert patient was “degrading and humiliating” and not providing care was a matter of respect and human integrity. These barriers are important and difficult to overcome and ways to overcome these issues need to be investigated further. Although a few studies have examined training programme failures, none explored why nurses and HCWs responded to programmes or how training achieved a positive impact on care.



### **1.2.10. Addressing the failure to improve oral care**

As discussed, patients who need oral care do not always receive it. Health care workers can often feel unsupported when providing oral (Coleman, 2002) and other nursing care (Wilkin and Slevin, 2004). This lack of support may affect the way that training and information is received. Eadie et al. (1992) in a study using eight focus groups revealed that HCWs in care homes felt insulted and upset by an oral care information leaflet because it made them feel unsupported by their organisations. The leaflet reportedly implied that they were personally responsible for failing their patients and did not acknowledge organisational responsibility. This indicates that training information can be deemed unacceptable and staff attitudes to training may be important for care.

Non-responses to oral care training were examined in further detail by Reed et al. (2006), who found that the HCWs who did not respond well to training were concerned about being bitten, time constraints and struggled with the physical limitations of providing care. This conclusion was in agreement with Weeks and Fiske (1994), who in a small qualitative study of carers concluded that in order to overcome barriers to care, the attitudes and values of care staff also need to be addressed in addition to knowledge deficits. This also agreed with Pyle et al. (1999), who reached similar conclusions from a questionnaire based survey of nursing assistants.

Ongoing negative attitudes and neglect were identified as common features in the more recent ICU oral care studies (Yeung and Chui, 2010) suggesting that barriers to oral care in hospitals remain. Therefore, there are barriers that preclude individual HCWs from being able to deliver patient oral care, which do not appear to be addressed by training and complex interventions. These barriers involve nurses and HCWs' attitudes, experiences and emotions, which will be explored in the final part of this literature review.

### **1.3. Emotion in the context of nursing and other health care workers' social, cultural and attitudinal experiences of the mouth and its care**

#### **1.3.1. Introduction**

This section of the literature review examines nurses and HCWs' emotions in the context of nursing, the mouth and its care. This commences by considering the definition of emotion and what an emotional experience is. Theories relating to the purpose of emotions are then examined. A brief overview of emotions towards nursing care is provided in advance of a review of the literature relating to social, cultural and attitudinal experiences of the mouth and its care.

For this section, a search was conducted for literature relating to nurses and carers' emotional experiences of providing oral care, search terms used are outlined in Appendix 1.1. No articles were identified from hospital or care home environments but a small number of studies reportedly examining nurses and carers' attitudes were found for hospital ITU and care home settings. These studies are considered in this section along with wider literature for emotions and health interactions.

#### **1.3.2. Defining emotion**

Emotions are complicated and there is no clear answer to the question 'what is an emotion?'. Lazarus (1999) stated that an "emotion is always a response to a meaning" and further explained that when considering individual emotional experiences, the meaning and not the origin of the experience was important. This view suggests a relationship between emotional information and meaning. Manstead et al. (2004) also described emotions as involving physiological bio-regulatory reactions. Both descriptions are similar in terms of a reactive and responsive state and encompass a wide range of experiences but neither gives a precise

reproducible state. Despite considerable debate, terms and definitive descriptions for emotion remain elusive.

Ekman (1999), stated that no “hallmark distinguishes emotions” but literary writers use experiential reports and physiological descriptions to convey emotions (Ackerman and Puglisi, 2012). Emotions are also communicated in theatre, art and advertising. Thus, although emotions may not be completely understood, and are not easily defined, common understandings of emotional experiences exist and are recognised across society.

It has long been acknowledged that emotions involve physiological responses and emotional feelings but the role and relationship between these elements of the experience has been debated. For example, while James (1884) said physiological reactions to emotional experiences evoked emotions, Cannon (1927, 1931) proposed that both emotional feelings and physiological reactions were triggered by centralised processes in the brain. Theories relating to emotions continue to be discussed and later perspectives have viewed emotions on both conscious and subconscious levels but again, perspectives vary. Zajonc (1980), amongst others suggest that emotional experiences are below the level of human consciousness, stating that cognition and a conscious awareness of emotion may not be necessary for an emotional response. Lazarus and Folkman (1984) however argue that consciousness is involved at some level and cognition is always linked to emotion. Bechara et al. (2000), when measuring emotions and decisions from a neurological perspective concluded that emotional experience operated on multiple levels involving both cognitive and subconscious experiences. A full overview of the role of cognition and conscious awareness in emotion is beyond this thesis, however, this evidence indicates that nurses may experience a complex range of conscious and subconscious emotions, which may be relevant to patient care.

### **1.3.3. Purpose**

Emotions are linked to thoughts and actions and Solomon (1976) described emotions as judgements, inferring that emotions were involved in decisional processes. This concept of emotions as a mode of assessment was developed by Frijda et al. (1986, 1989) who suggested that emotions evolved as a “signalling function” to inform the body of environmental occurrences turning attention from routine tasks to focus on threatening situations in readiness to take action.

Empirical evidence agrees with a relationship between emotion and physical protection. For example, emotions are evoked towards potentially harmful stimuli this suggests that emotions can help individuals to differentiate harmful stimuli from non-harmful stimuli. Evidence also links emotion to behaviour (Deacon and Olatunji, 2007), which may imply that emotion has a role in the behavioural avoidance of harmful stimuli. The evidence does not cover all emotions and it is possible that some emotions do not serve this purpose. Emotions do however appear to communicate information to individuals about the physical and social environment and this information is associated with behaviour. The way that individuals regulate and deal with their emotions is also considered to be relevant to the way that they behave, evaluate and respond to situations (Gross, 1998, Gross and John, 2003).

Emotions have been connected to social judgements (Forgas, 1991, Parrott, 2001) and appraisals which can also serve to protect the body from harmful situations and stimuli in society. There is evidence to show that some emotional signals are communicated through the face and body and these signals are detected and read by others (Ekman, 2007). These emotional signals may help individuals to function within social groups. Forgas and Zanna (1992) also proposed that emotions are externally expressed within social communication to influence the behaviour of others, for example signals of fear may be a signal which asks others around to stop threatening behaviour. This may help survival by helping individuals to develop emotional relationships enabling individuals to be looked after and protected within social groups. Moral emotions may also prevent individuals destroying

each other, strengthening social groups. This suggests that emotions may enable individuals to survive through membership of a cohesive society.

#### **1.3.4. Social interactions, patient care and emotion**

Emotions have long been considered part of nursing and the term “care” is used in language to describe affection and nurture. Bolton (2001) described how nurses acted out caring emotions for their patients in order to meet patients’ needs. Tarlier (2004), when examining the discourse and philosophy of care also found that moral displays of empathetic and sympathetic emotions were significant for nurses and patients. This suggests that the care delivered to patients is both physical and emotional in terms of acts and expressions.

Despite the positive terminology for nursing care and the delivery of positive emotional expressions, it seems that for nurses, the delivery of care is associated with a variety of conflicting emotions. Menzies-Lyth (1960), in an early social report of nursing described how nursing care involves unpleasant, disgusting, distressing and frightening tasks. This reflective account was not supported by empirical evidence but these findings are widely quoted with a sense of legitimacy within the nursing profession. Ely (1999) in a study of nurses’ attitudes to body elimination products reported that that many nurses found body products unpleasant. She argued that this feeling could help nurses to identify hygiene problems on the wards and assisted them with keeping the wards clean. Holmes et al. (2006), in a later article agreed that nursing care could be physically unpleasant and then expanded on this by suggesting that nursing could also be morally unpleasant. Despite the small studies, and limited evidence, these studies do indicate that nursing involves both positive and negative experiences of interpersonal and physical care for patients. As emotions are associated with behaviour, these experiences may therefore influence care provision.

### **1.3.5. Emotion and nursing action**

Nursing care is an interpersonal experience and those providing care witness emotional signals; displays of suffering. Monin and Schulz (2009) described these signals as signs of physical, psychological and existential distress. Nursing responses to this distress are often presented as altruistic. Ekman et al. (1981) has however argued that despite appearances, the motivation to act for another may involve an element of personal gain and it is plausible that nurses find caring for others emotionally rewarding.

Patient suffering may also motivate nurses to act because of empathy with patient distress. Batson et al. (1995a) demonstrated in a series of experiments that students were motivated to act to alleviate distress in another person indicating that students detected emotional distress and acted in response to this. It is possible that they also feel distress in response to patient suffering and care may alleviate both patient discomfort and their own. In agreement with this, Fields et al. (2004) in a small study of HCWs showed that nurses expressed more empathy than doctors and suggested that moral emotions and empathy may be important for nursing roles and the provision of care.

### **1.3.6. Moral emotion and nursing**

The motivational drive for nurses and carers to provide care for patients is considered to be a moral experience and nursing has been described as moral work (Storch and Kenny, 2007). Moral emotions are reported to include shame, guilt, embarrassment, moral elevation, gratitude and pride (Tangney et al., 2007). Suggestions that moral emotions are experienced in relation to care agree with evidence from the nursing and care literature. Kim et al. (2007) in a small longitudinal study of moral judgements, using a validated scale for nursing judgements, also found that care situations can evoke moral conflicts in nurses. Hartrick Doane (2002) used qualitative methods to explore nurses' experiences of care and found experiences of emotional guilt, anger and frustration in relation to moral dilemmas. Many of

these situations involved patient personal integrity, which suggests that social and interpersonal interactions in nursing can evoke moral emotions. This evidence suggests that moral emotions may be associated with physical care acts that cross physical, social and personal boundaries.

### **1.3.7. Social interactions with the mouth and its care**

Nurses and other HCWs interact physically and socially with patients' mouths to provide oral care and these interactions evoke emotions. The mouth, is described as a boundary between "self" and the public (Douglas 1996). It is considered to have symbolic and social meanings (Douglas 1996, Nettleton, 2002) and is often associated with social taboo (Douglas, 1996). In most cultures touching the mouth is usually only carried out between people with close relationships (Journard, 1966, Argyle, 1988). Studies of touch agree with this theoretical view as the mouth has been shown to be an intimate area of the body that is rarely touched by other people (Journard, 1966, Argyle, 1988, Hall, 1988).

There are social and cultural rules about who may touch the mouth and what can be put into the mouth (Thorogood, 2000) which may influence oral care. Exley (2009) stated that the negotiation and legitimisation of oral boundary transgressions in health care is not yet understood but it is clear that professional touch in health has a different meaning and purpose compared to social touch (Routasalo, 1999). This perspective agrees with professional nurses, who report that in nursing care, "touch must be used correctly" (Wilkin and Slevin, 2004).

### **1.3.8. Emotion, attitudes and social interactions with the mouth and its care**

Nurses' emotions towards the mouth can reflect social rules that influence oral care. A small qualitative study using focus groups in Scotland found that oral care was deemed to be a threat to privacy and dignity (Eadie and Schou, 1992). Wardh et al. (2000), in a larger Scandinavian study similarly

found HCWs in long term care felt that oral care was a violation of personal integrity. These feelings are have also been identified in hospitals and an interview based qualitative study of cancer care nurses, demonstrated that 45% of nurses in the study objected to examining their patient's mouths (Ohrn et al., 2000). The main reason for objecting was given as the patients' personal integrity. Although emotions were not explicitly explored, this study does indicate that social emotions may arise and be relevant for care. Each of these studies alluded to a sense of personal violation that influenced care provision but despite this, none directly related emotion to the clinical care. Furthermore, studies did not explain whether these emotional threats were overcome and if so, how this was achieved.

Social barriers also appear to exist towards oral care discussions with patients. Chung et al. (2000), in an attitudinal questionnaire study found that some health professionals perceived the mouth as a taboo subject. This sense of taboo is supported by evidence from the Ohrn et al. (2000) study in a cancer care ward which found that some nurses felt uncomfortable and embarrassed about asking a patient if they wanted oral care. Wardh et al. (2003) in a further study also found HCWs felt embarrassed towards offering assistance with oral care. In this study he expanded the understanding of these interpersonal barriers and illustrated that HCWs used measures that helped them cope with providing oral care. Furthermore, a focus group based study also found that oral care could be a distressing task for individuals who cared for relatives. Carers attributed this distress to the burden of observing their relatives losing their ability to self-care (Eadie and Schou, 1992). These findings suggest that oral care is socially meaningful. They also infer that attitudes towards oral care are associated with emotional feelings and these relate to interpersonal barriers that prevent oral care from being initiated and carried out.

Oral care is widely considered to be an important component of health (MacEntee et al., 1999) and "total patient care" for dependent adults (Cohn et al., 2006). Views of what determines good care can vary and Wardh et al.



(1997), found that qualified nurses in long term care are more likely to view oral care as “good nursing” than less qualified care aides.

Positive views towards oral care do not appear to ensure optimal care. For example, Wardh et al. (1997) found that carers who considered oral care to be good practice could still hold negative attitudes towards oral care. Chiba et al. (2009) in a later study also found that although 90% of 102 caregiver managers felt that oral care was important, these positive oral care beliefs did not translate into clinical oral care practices. Dharamsi et al. (2009) also had similar findings in care homes. These findings suggest that an understanding of good practice may be insufficient for ensuring good oral care.

A number of studies have identified negative attitudes towards oral care (Eadie and Schou, 1992, Chalmers et al., 1996, Wardh et al., 2000). These studies all found that nurses and other HCWs in long-term care considered oral care to be less important and a lower priority than other nursing tasks. The idea of oral care being a low priority has also been identified beyond the nursing profession and Folke et al. (2009) found that non-dental healthcare professionals were often indifferent to oral conditions such as Xerostomia. It is possible that concepts of priority towards oral care may relate to professional roles and Andersson et al. (2007a), in a study of district nurses, that found oral care was considered to be the remit of dental professions. This evidence supports the idea of attitudinal barriers to oral care that may relate to professional roles. As emotions are associated with attitudes, this also means that negative emotions may also exist towards delivering oral care to patients.

### **1.3.9. Anxieties towards oral care**

Oral care is reported to be a difficult task in nursing because of physical barriers to providing oral care (Reed et al., 2006). These physical challenges may vary for different hospital settings and in intensive care, safely negotiating endotracheal breathing tubes to provide oral care for

unconscious intubated patients has been portrayed as very challenging for nurses in intensive care (Berry and Davidson, 2006). Furthermore, a number of studies have reported that providing oral care for conscious patients in residential care and hospitals can be difficult due to lack of co-operation (Frenkel, 1999, Johnson and Lange, 1999, Pyle et al., 1999, Chung et al., 2000) and physical resistance from patients (Coleman and Watson, 2006, Dharamsi et al., 2009).

Resistance to oral care is commonly reported as a barrier to care in hospitals and long term care settings (Vigild, 1989, Chalmers et al., 1996, Coleman and Watson, 2006, Dharamsi et al., 2009, Jablonski et al., 2009, Jablonski et al., 2011a, Jablonski et al., 2011b). In one small study, 63% of residents in care were reported to resist oral care (Coleman and Watson, 2006) this shows similarities to another study of care aides in 25 nursing care facilities in Australia which found that 80% of carers surveyed experienced refusals and resistance from patients towards oral care (Chalmers et al., 1996). As no standards were set for measuring resistance, it is difficult to determine how precise estimates of resistant patients are or how they affect care. These studies do concur that oral care can be a physically challenging experience for nurses.

Physical resistance to care can include outwardly violent and potentially harmful behaviours from patients. In residential facilities in Australia, over one third of the 488 care aides surveyed had been bitten by patients and 58.6% had been subjected to kicking or hitting by residents when providing oral care (Chalmers et al., 1996). The physical risk from providing oral care has resulted in some HCWs in residential care being instructed to avoid putting fingers in patients' mouths (Dharamsi et al., 2009). To provide care in nursing, it is considered important to acknowledge "patients vulnerability" (Wilkin and Slevin, 2004), but it is evident that when providing oral care both the HCW and patient can be vulnerable to harm and this may affect the delivery of patient care. These studies of resistant behaviour also describe nurses and HCWs' anxieties towards providing oral care for resistant patients (Vigild, 1989, Chalmers et al., 1996, Coleman and Watson, 2006, Dharamsi

et al., 2009, Jablonski et al., 2009, Jablonski et al., 2011a, Jablonski et al., 2011b). Although the emotions associated with these experiences and the relationship with care behaviours were not examined in detail, these study findings suggest that oral care can be physically challenging and difficult and that emotions relating to this may be important for the delivery of oral care.

#### **1.3.10. Emotions and interactions with the contaminated mouth**

The mouth is symbolically associated with concepts of risk and danger (Douglas 1996). The mouth is “inside” the body and is associated with physical danger and contamination. Objects that have been inside the body can become “contaminated” (Thorogood, 2000) but contamination fears can also exist without physical contact (Rachman, 2004). Objects contaminated by the body can be perceived as contaminated even after they have been sterilised because “dirt” itself is both physical and conceptual (Douglas 1996). There are specific behaviours and conventions associated with dirt (Deacon and Olatunji, 2007) which include actions to hide the appearances of dirt (James, 1960) and to avoid contact with contaminated objects or bodies (Deacon and Olatunji, 2007).

There are social rules about how objects such as toothbrushes that have entered the mouth and become contaminated, are managed (Thorogood, 2000). These behaviours have been associated with contamination fears (Olatunji and Deacon, 2008) and it has been suggested that the fear of contamination, emotional disgust and behaviours associated with these emotions have evolved during development as behavioural protection from infections and harm (Curtis and Biran, 2001, Curtis, 2007, Deacon and Olatunji, 2007, Olatunji and Deacon, 2008). The emotion of disgust may therefore have a protective purpose in relation to contamination. Although this concept is plausible, protective behaviours may also be learned and Douglas (1996) has argued that some of the behaviours associated with “dirt” are to conform socially rather than avoid disease. It has been proposed (Curtis and Biran, 2001, Curtis, 2007) that avoidant behaviours towards disgusting stimuli are an inherent or learned response to protect the body

from contaminants. Most of this evidence was collected within psychology student populations under test conditions and so this may be an oversimplified view of lived experience. Social conformity is however protective and therefore it is possible that emotional reactions are adapted and developed to respond to both social and physical threats.

#### **1.3.11. Disgust, violation and contamination**

Haidt et al. (1994) reported that emotional disgust is evoked in response to seven elicitors which include 'body envelope violations' and contamination. Beyond this, Dalgleish and Power (1999) describe emotional disgust as characterised by the expulsion of an unwanted or offensive substance often food from the mouth. These descriptions agree with the suggestion that disgust is an emotion that protects the integrity of the body.

The emotion of disgust is not always an isolated experience and a number of studies (Thorpe and Salkovskis, 1998, Van Overveld et al., 2006, Van Overveld et al., 2008) have also associated disgust with phobic anxieties and behaviours, indicating a link between emotion and behaviour. Psychological experiments in test conditions support this concept and experiments by Deacon and Olatunji (2007) and Olatunji and Deacon (2008) showed that avoidant behaviour is associated with disgust and contamination fear. These experiments also suggested that an individual's propensity for disgust may influence responding.

#### **1.3.12. Unpleasantness and oral care**

Oral care has been described as unpleasant and even bothersome in a number of studies of HCWs in long term care (Eadie and Schou, 1992, Weeks and Fiske, 1994, Furr et al., 2004, Reed et al., 2006) and nurses working in hospitals (Furr et al., 2004). Studies have also found that HCWs can experience a "distaste for teeth and dentures" (Frenkel, 1999) and these feelings are most commonly experienced amongst lower grades of staff (Wardh et al., 2000, Cohn et al., 2006) who are most likely to perform this

care in care homes (Wardh et al., 2000). Finding oral care unpleasant has been associated with inferior quality oral care (Furr et al., 2004). However, these studies have been based upon self-reported frequencies of oral care procedures and not clinical care. It is therefore not possible to determine how these attitudes are linked to the time spent providing care or if these attitudes actually prevent care. A number of studies have however stated that unpleasantness is a barrier to care for patient care (Eadie and Schou, 1992, Weeks and Fiske, 1994, Reed et al., 2006).

### **1.3.13. Disgust in nursing**

Few studies include nurses' emotional disgust towards care. Templer et al. (1984) used a questionnaire based study in a sample of psychology students to examine the relationship between body elimination attitudes, personality and disgust. His study found that some people were more prone to finding body products unpleasant than others. He also found a relationship between negative body elimination attitudes and disgust. His questionnaire was also used to compare vocational choices (Corgiat et al., 1986) and to examine nurses' reactions to body products (Ely, 1999). The findings of these studies indicated that nurses experienced disgust and that nurses were more disgusted by body elimination products than those who followed other professions. It was argued that nurses used emotional disgust to help them provide care. Evidence from laboratory studies agree with disgust as a motivating factor for hygiene behaviours, for example, induced disgust has been shown to influence hand washing behaviour (Porzig-Drummond et al., 2009). There is however little evidence to show whether this emotion directly influences nurses hand hygiene behaviours, but this evidence suggests that these emotions may be relevant to hygiene behaviours including oral care.

### **1.3.14. Coping with emotions of oral nursing care**

Emotional reactions are addressed using coping actions and so evidence of coping may indicate emotional responses. Nurses report using a number of

strategies to deal with difficult nursing care tasks, these include breaking down tasks, depersonalising and ritualising activities (Menzies-Lyth, 1960) and there is evidence to suggest that nurses and carers use coping skills for dealing with moral and ethical care issues (Healy and McKay, 2000, Raines, 2000), Badger and O'Connor (2006). With this understanding, it is interesting that oral care is also commonly considered to be a ritual activity (Kite and Pearson, 1995, Gibson et al., 1997), which implies that for some, oral care is an emotionally difficult task.

Coping is also associated with emotion, furthermore, coping and stress have both been linked to emotional intelligence (Augusto Landa et al., 2008) which is the awareness of emotions in the self and others. It is considered that some nurses are more emotionally intelligent than others (McQueen, 2004, Codier et al., 2008, Rego et al., 2010) and some nurses may be more aware of their emotions than others.

This evidence suggests nurses and HCWs may experience emotions towards oral care. These emotional reactions may be influenced by individual sensitivity to emotions and can relate to protective responses; these may affect oral care. Although nurses and HCWs may be aware of some of their emotional reactions to oral care, it is possible that implicit emotions may also be relevant to care.

#### **1.4. Capturing and measuring emotions**

This, the final section of the literature review provides an overview of emotion measurement relevant to three academic disciplines: dentistry, nursing and psychology. This will include characterisation of emotions, methodological approaches for emotion measurement, and theoretical frameworks for exploring emotional data. Quantitative methods to capture and measure explicit and implicit emotions will be considered. This review commences with general emotions and then focuses on emotional disgust because, as discussed, this emotion is relevant to the mouth, morality, emotions of anxiety and behaviour.

### 1.4.1. Emotion measurement

Within psychology, there are a plethora of techniques for measuring emotional responding and experience. Mauss and Robinson (2009) in a review of these explained the advantages and disadvantages of each. A summary from a review outlining the emotion response systems, measures to capture emotion and what each measure was sensitive to is shown in Table 1.1. From this work, they concluded that there is no 'gold standard' for measuring emotion.

**Table 1.1 Overview of emotion response systems, measures of emotion and emotion sensitivity states for these emotion response systems and measures, adapted from Mauss and Robinson (2009)**

Emotion System	Response	Emotion Measure	Emotion measure sensitive to:
Subjective experience		Self-report	Valence and arousal
Peripheral Autonomic Nervous System (ANS)	physiology	Autonomic nervous system (ANS) measures e.g. heart rate, blood pressure, cardiac output, heart rate variability, electrodermal	Valence and arousal
Affect-modulated startle		Startle response and magnitude motor actions of the eye, neck and blink	Valence at particularly high levels of arousal
Central Central Nervous System (CNS)	physiology	Electroencephalography (EEG) Functional magnetic Neuroimaging (fMRI), positron emission tomography (PET)	Approach and avoidance
Behaviour		Vocal characteristics e.g. amplitude and pitch	Arousal
		Facial behaviours, observer ratings, Electromyography (EMG) Body behaviour: observer ratings	Valence with some emotion specificity

### **1.4.2. Specific emotions and measurement**

Different emotions have distinct and characteristic patterns of emotional expression. Ekman (1972, 2007) demonstrated patterns of facial expression for different emotions, and showed that many were recognisable across cultures. In addition, there is evidence of emotional patterns of expression through vocal tone, heart rate (Lane et al., 2009) and changes in skin conductance. Patterns of emotional responses are better understood for discrete single emotions, for example, love, hate and fear. These are considered easier to detect and interpret and understand (Ekman, 1999) than complex, mixed emotional experiences.

### **1.4.3. Measurement of explicit emotion**

Explicit measures, for example self-report are well used in emotion research (Mauss and Robinson, 2009). There are a range of explicit emotion signals which can be captured to allow a range of emotional experiences to be explored. The most commonly used of these is self-report.

### **1.4.4. Self-report and qualitative methods to capture emotions**

Self-reported expressions of emotion are commonly conveyed in both writing and speech (Ackerman and Puglisi, 2012). These emotional data are often collected through natural speech but emotional expression within natural speech can vary (Douglas-Cowie et al., 2003). The validity and specificity (Robinson and Clore, 2002) of self-reported methods have been questioned because of the variability of responses and measurements. Self-report measures of emotion include words and speech in both written and verbal formats. Feldman-Barrett (2004) described these expressions as representing the “properties of the feelings” experienced.

Psychologists have used emotion words for different categories of emotional experiences. For example Plutchik (1980), developed a wheel of emotions which outlined eight primary emotions of acceptance, anger, anticipation,



disgust, joy, fear, sadness and surprise; emotion words were then used for the subcategories of emotions within this framework. Similarly, other theorists have also used words to categorise emotions (Parrott, 2001).

Plutchik (2000) expanded these and further classified emotions with experience and behaviours. Classification theories of emotion however vary and the categorisation of some emotions appear to diverge from the literature, for example the domains of disgust have received little attention. Furthermore he also suggested that caregiving emotions were different which means that these complex classification systems may not apply fully to caregiving emotions. These classifications may however be useful for emotional terminology.

Emotional word lists have been developed for emotion research. These include ANEW lists which contain words, that have been rated for emotional valence and affect (Bradley and Lang, 1999). Wordnet databases also contain terminology grouped into cognitive subsets “interlinked by means of conceptual-semantic and lexical relations”. These are however predominantly based on American words and it is difficult to confirm that these words have the same meaning in the United Kingdom. These studies therefore agree that expressed terminology can have emotional meaning and suggest that qualitative descriptive terms may be used to understand emotions towards oral care.

Advocates for qualitative methods for example, Krueger and Casey (2000) and Silverman (2000, 2005) argue that qualitative approaches are suited to capturing the experiential nature of real life events. Some consider that current emotional experiences provide the most reliable self-report data (Robinson and Clore, 2002). Curci and Bellelli (2004), however used qualitative research to illuminate emotional experiences in past events. In his studies, he demonstrated that the emotional qualities of an experience could be shared in verbal expressions relating to these past events. His studies used emotional language, which is considered to provide rich and meaningful expressions of experience. This evidence agrees with the suggestion that qualitative methods can be used to capture and explore

experiences (Rimé et al., 2002). These methods can be used to capture interactive group response data and individual level data.

#### **1.4.5. Social interactions and capturing emotions in focus groups**

Emotion is associated with social experience and Lutz and White (1986) described emotions “as being important for defining and negotiating social relations of the self”. A similar concept was also described by the Belgian psychologist, Bernard Rimé who suggested that emotions and social interactions were dynamically interconnected, with interpersonal reactions regulating emotions (Rimé et al., 2002, Rimé, 2009).

Qualitative studies have shown a relationship between interpersonal interactions and emotions, for example, Shortt and Pennebaker (1992) demonstrated that listening to personal accounts of emotional events could elicit emotional reactions. Interpersonal emotional reactions to personal emotional experiences are believed to have a social function (Keltner and Haidt, 1999) and as discussed in (Peters and Kashima, 2007), are readily observed in group situations.

Emotion sharing and communication within groups has been used for advertising research for many years (Krueger and Casey, 2000). A major technique for collecting these emotions is through focus groups which are used to tap into participant emotions (Krueger and Casey, 2000, Fern, 2001) and reports of the ‘focussed interview’ appeared in journals as far back as 1946 (Merton and Kendall, 1946). These techniques have been used increasingly to “generate thoughts, feelings and behaviours” (Fern, 2001) within scientific research.

Focus groups are considered to generate a greater “naturalness” of responses (Morgan, 1997), and are considered useful for the scientific exploration of emotional experiences (Kitzinger, 1994). For example, focus groups have been used to illuminate emotional experiences for example in relation to health (Zangi et al., 2011), healthy settings (Bauer et al., 2004), communication (Sheldon et al., 2006) and risk (Green and Hart, 1998).

Focus groups have also been used to understand taboo subjects (Kitzinger, 1994) because the group environment can facilitate discussion.

#### **1.4.6. Focus groups in nursing research**

Focus groups are considered to enhance the understanding of nursing (Sim, 1998) and have been used to create theoretical frameworks of health and care (Wuest, 2000). These techniques have been particularly helpful for developing an understanding of the experience of providing care (Badger and O'Connor, 2006, Sheldon et al., 2006, Garon et al., 2009). Although few nursing studies meet quality criteria for qualitative research (Sim, 1998, Webb, 2001), these techniques are still considered to generate important information.

Focus groups have been used in a small number of nursing-dentistry studies exploring barriers to oral care (Wardh et al., 2002a, Paley et al., 2009) generating experiential data relating to oral care experiences. These studies are not specific to the present study but do demonstrate that experiential data relating to oral care can be collected using focus groups.

#### **1.4.7. Interview for capturing experiences**

Interviews are used for the purpose of collecting individual level data for analysis in research. They have been used in a range of nursing studies, but as previously described, many studies using these methods are considered to lack in quality; few studies have examined emotions in nursing. Interviews are considered useful for understanding respondent understanding, thinking and question navigation (Forsyth and Lessler, 1991, Blair and Presser, 1993, Presser et al., 2004). Interviews are commonly undertaken on a one-to-one basis and provide the opportunities to use verbal questions and prompts to find out further information and better understand experiences. Interviews can involve structured and unstructured approaches to questioning, and each approach has strengths and weaknesses. Structured approaches to interviews can involve following a prescribed questionnaire and response

data from this can often be compared (Kvale, 1996, Kvale, 2007). Data from structured approaches can however miss out details of experiences not covered by the questionnaire. Semi-structured and unstructured approaches can use open questions, which generate more breadth and can also provide more depth of data. As participants can effectively answer different questions for less structured approaches, data from these can be less comparable and more challenging to analyse (Krueger and Casey, 2000). This provides more comparable answers, but can afford less opportunity to explore participant reasoning. As emotions are reactive states, it is possible that less structured approaches may allow participants more opportunities to demonstrate reactions.

Interviews can be used to verify and clarify focus group data (Kvale, 1996, Kvale, 2007). During each focus group each participant only contributes a limited amount of time and data. Interviews can provide the time for individuals to expand upon their answers. They can also be used to examine differences between responses on an individual level and group situations. This evidence indicates that interviews are well established as an additional method of data collection to compliment focus group data and overcome limitations of social interaction data.

Interviews can also be applied to the development and verification of question and scale content (Kvale, 1996, Kvale, 2007). This is often carried out using questions and scales as a guide for interviews. Interview methods can also be used to understand how items within questionnaires are compared. Techniques for this include sorting and rating of items, objects or images. There are a variety of techniques and approaches for sorting objects and concepts in interviews across different disciplines. These include Q methodology for developing and sorting qualitative statements and multidimensional scaling analysis for ranking questionnaire items (Baker et al., 2006, Martins and Pliner, 2006). Although there is no single recommended technique for rating objects during interviews, each involves the development of an understanding of how an object or item is perceived

through the rating process. As a result, interview techniques for rating stimuli may be useful for capturing emotional valance in studies.

#### **1.4.8. Self-report questionnaires**

As discussed, self-report is commonly used for capturing emotional reactions. An alternative to interviews and focus groups is self-report in questionnaires which are often used in emotion studies (Plutchik, 1989). Questionnaires can be developed to include a variety of vignettes, scenarios, image stimuli; and can be delivered with a range of other established psychological tests allowing a mechanism for comparisons between different measures of emotion. Questionnaires can be delivered without attendance to a wide national and international population. They can be useful for collecting data from wider populations with different working hours and can be adapted for both electronic and paper delivery to suit the needs of different populations.

Questionnaires may also provide a greater sense of anonymity, which can help address issues of response and social desirability bias (Bradburn et al., 1978, Baumeister, 1982, Paulhus, 1984), which were discussed as a possible bias in the initial study in this thesis.

Although questionnaire based tools have been developed and used to quantify and compare emotional reactivity to dental stimuli (Humphris et al., 1995a, Humphris et al., 1995b, Humphris et al., 2000, Dailey et al., 2001, Armfield, 2008) this work has mainly focussed on dental fear. A small number of studies were identified for emotional reactions to dental stimuli. For example, (Robin et al., 1998) found that dental odours evoked self-reported fear in dentally anxious individuals. Although no studies were found for nurses, this evidence indicates that nurses' reactions to dental stimuli may be relevant to their emotions.

No validated tools were identified from the existing literature for the collection of emotional data towards specific oral care scenarios in hospitals or care institutions. Additionally, tools for emotions measurement towards

experiences for example other areas of nursing care were examined, but none were suitable for adaption because most were based upon descriptive items. For example, statements in the emotional intelligence questionnaire “I am aware of my emotions as I experience them” (Schutte et al., 1998) is used to examine emotional awareness. Therefore, to quantify emotions and measure towards oral care stimuli, qualitative enquiry to identify the range of potential questionnaire items were indicated in advance of questionnaire development.

Questionnaire design is important for the quality of information generated in a study using these methods. Questions and scales can limit the range and reliability and validity of information. The development of a validated questionnaire for measuring emotional and attitudinal information can involve exploratory work to identify the full range of items, question and scale development, piloting and work to ensure the validity, reliability and psychometric properties of the instrument (Oppenheim, 1992, DeVon et al., 2007).

#### **1.4.9. Individual differences in emotional reactions**

Individual emotional responding is associated with personality traits and individual differences in sensitivity to emotional stimuli. Furthermore disgust sensitivity is associated with the big five personality traits (Druschel and Sherman, 1999), which are: openness to experience, conscientiousness, extraversion, agreeableness and neuroticism (Costa and McCrae, 2008). These personality traits are considered fundamental to personality and behaviours and it is possible that emotional reactions to oral stimuli are associated with personality traits. Emotions include emotional states and traits (Egloff and Hock, 2001), which can be different and therefore may need to be measured separately. Differences in student nurses reactions to oral care scenarios may therefore reflect personality traits or general emotional tendencies.

#### **1.4.10. Disgust sensitivity**

As discussed, evidence suggests that oral care can be unpleasant for nurses (Furr et al., 2004) and disgust has been associated with the mouth, morality, dental fear and odours (Robin et al., 1999, Armfield, 2008, Chapman et al., 2009, Eskine et al., 2011, Russell and Giner-Sorolla, 2011, Russell and Giner-Sorolla, 2013). It is therefore plausible that emotional disgust is associated with oral care. For example, it is possible that disgust is evoked as a direct response to oral care stimuli or disgust could however be evoked indirectly along with other responses to oral stimuli. Disgust sensitivity varies between individuals (Haidt et al., 1994, Van Overveld et al., 2010b) and disgust sensitivity has been shown to be predictive of emotional responses to emotional image stimuli (Mataix-Cols et al., 2008); it is therefore also possible that disgust towards oral care stimuli may also reflect individual response tendencies towards generally unpleasant stimuli.

The disgust sensitivity scale (DSS) is a psychological questionnaire inventory based upon the seven domains of disgust (Haidt et al., 1994). Stimuli from each of the seven domains can elicit disgust. These domains include: food, animals, body products, sex, envelope violations, death, and hygiene. There is also one further domain included within the inventory, which is sympathetic magic. This reflects the idea that an object can still feel contaminated after it has been cleaned. Four of these seven domains of disgust are potentially associated with oral care. Firstly, food is incorporated within the mouth and can be present during cleaning. Secondly, the mouth contains body products such as saliva and, at times blood. Thirdly, body envelope violations may arise when a toothbrush enters the mouth. Finally, oral care is essentially associated with the domain of hygiene. The disgust sensitivity questionnaire is an inventory to measure sensitivity to these disgust domains but it is not specific to dental stimuli. The disgust sensitivity questionnaire has been validated in many countries (Bjorklund and Hursti, 2004). Disgust sensitivity has been associated with personality traits (Haidt et al., 1994, Van Overveld et al., 2011).

Disgust is considered to be a moral emotion (Rozin et al., 2009) and elicitation of emotional disgust has been shown to influence moral judgements. Disgust sensitivity responses have been associated with moral hypervigilance and moral experiences (Jones and Fitness, 2008). It has also been used for moral intuitions relating to political voting (Inbar et al., 2012). It is therefore useful for studies examining the moral dimension of disgust. However the moral domains within the questionnaire are generic moral traits and are not specific to nursing care or the drive to care for others.

DSS reactions are associated with avoidant behaviours (Woody and Tolin, 2002, Dorfan and Woody, 2011). It is also associated with obsessive-compulsive disorders (Olatunji et al., 2004, Olatunji et al., 2009b, Olatunji et al., 2010b). This has also been used to examine emotional disgust reactivity in phobias (Koch et al., 2002, Armfield, 2008, Armstrong et al., 2010, Bianchi and Carter, 2012).

It has also been used to explore the willingness to undertake unpleasant tasks (Koch et al., 2002, Woody and Tolin, 2002, Deacon and Olatunji, 2007) and is therefore useful for examining individual differences in disgust sensitivity in relation to oral care behaviours.

A three-domain version of the disgust sensitivity questionnaire has been developed and validated. This includes domains of pathogen, sex and moral disgust. It is possible that this scale is less relevant to oral care than the seven-domain scale because it excludes domains of disgust that are potentially relevant to the mouth and oral care.

The seven domain DSS provides quantitative measure of individual reactivity to disgust stimuli which has been revised to improve sensitivity to individual domains of disgust and the validity of the instrument (Van Overveld et al., 2011).

#### **1.4.11. Theoretical models for emotion**

Although emotion has been associated with behaviour, there are few theoretical models for undertaking research to explore relationships and



behaviour. Most models for behaviour were developed for attitudes for example, the theory of planned behaviour (Ajzen, 1991). This model proposes that behavioural beliefs, control beliefs and normative beliefs underpin attitudes and behaviours. A criticism of this model is that it does not account for immediate emotional reaction. As emotions are associated with cognition, it is possible that the model may relate to emotions but this has not been proven.

Another model for behaviour is cognitive dissonance theory, which outlines the discomfort arising from two conflicting cognitions (Festinger, 1962). This model explains that people behave to reduce the dissonance between their expectation and reality. Although this is not an emotion model, emotions are experienced during dissonant states.

These models were developed to explain behaviour in relation to personal actions and were not developed for explaining actions towards the care of other people. No established models have been identified to explain behaviours for the care of others and on clinical level behavioural models have not shown to be very successful at predicting behaviour (Renz et al., 2007). In view of the need for qualitative research and the absence of an established behavioural model for emotions towards oral care, qualitative frameworks were considered for the initial study.

#### **1.4.12. Conceptual frameworks for experiential data**

A conceptual framework for a focus group has been described as including elements of: “group cohesion, the discussion processes, the outcome, group composition, research setting, the moderator and group process factors” (Fern, 2001), each influences the focus group. Focus group design can be used to control factors in this conceptual framework. For example, purposively incorporating homogeneity within group can increase the cohesiveness and the ease of discussions (Krueger and Casey, 2000, Fern, 2001). This is because individuals participating can develop an appreciation that other group members share their concerns because of this, they may

feel more able to discuss personal issues, emotions and experiences (Derlega et al., 1973) which would not otherwise be shared (Kitzinger, 1994). The number of participants can also influence group dynamics; for example, focus groups can include between two and twelve individuals (Krueger and Casey, 2000). Smaller groups provide the opportunity for a homogeneous composition and greater sharing of information amongst participants (Fern, 2001). Conceptual frameworks are therefore potentially relevant to emotional data collection, analysis and findings. Focus groups are difficult to analyse for many reasons (Krueger and Casey, 2000) and a key issue is that focus group data are messy and unstructured. Theoretical frameworks are therefore particularly useful for studies using focus group techniques because they provide structure for data collection and analysis. This enhances study rigour.

Although focus groups can generate a range of interaction based data and although this is advantageous for understanding social experiences, it may also limit the range of experiences captured. Many studies use both focus groups and interviews together in order to collect individual experiences alongside grouped data.

#### **1.4.13. Grounded Theory frameworks**

Grounded Theory is a theoretical framework appropriate for focus group and interview data. It is particularly useful for unstructured data generated through focus groups because analysis involves data being fundamentally broken down during analysis.

Strauss and Corbin (1990) stated that:

“A Grounded Theory is one that is inductively derived from the study of the phenomenon that it represents. That is, it is discovered, developed and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon. Therefore, data collection, analysis, and standard theory stand in reciprocal relationship with each other. One does not begin with a

theory, then prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge”.

The process of Grounded Theory involves systematic processes of reasoning, comparing and testing data within the methods of inquiry, it is considered to be an inductive-deductive process (McGhee et al., 2007) however, some also consider the process to be abductive (Rennie, 2000). This involves dynamic interplay between the researcher and the data (Strauss and Corbin, 1990) for the purpose of developing understanding from the bottom up (Glasser and Strauss, 1967).

As with most qualitative methods, the appropriateness of using Grounded Theory for inquiry has been questioned and criticised (Haig, 1995). Thomas and James (2006) for example, argued that the use of Grounded Theory distorts data. Theorists themselves have fiercely debated the relative merits of traditional and evolved versions of Grounded Theory (Glasser, 2002) for the development of knowledge. Charmaz et al. (2002) and Charmaz (2006) for example claimed that Grounded Theory is constructed and not evolved (Smith, 2003, Charmaz, 2006) and Smith (2003) disputed the objective neutrality of the researcher in the process of Grounded Theory. Despite this criticism, there is much consensus regarding the strengths of this approach, specifically the capacity to develop into new and unexpected areas of understanding (Smith, 2003).

Grounded Theory has been successfully applied to nursing (Kelly, 1998, Adams et al., 2005, Andersson et al., 2007a) and oral care research (Paulsson et al., 2002, Wardh et al., 2003, Andersson et al., 2007b, De Mello and Erdmann, 2007, Hallberg and Klingberg, 2007). McMillan (2009) and Wasserman (2009) in separate articles both outlined that when conducted well, this approach can provide valuable findings which inform practice.

#### **1.4.14. Strauss and Corbin Grounded Theory**

As discussed, there are a number of variants of Grounded Theory. The Strauss and Corbin version was published in 1990; this approach is guided

towards verification of findings (Smith, 2003). When presenting this approach, Strauss argued that the “central criteria” (Strauss and Corbin, 1990) of fit, understanding, generality and control for Grounded Theory, described in the original version (Glasser and Strauss, 1967) had been adopted. The Strauss and Corbin (1990) version of Grounded Theory is well established and involves multiple stages of data coding, constant interaction with data, theoretical sampling, collecting data in response to data and using data to constantly test the emerging theory. It is more structured than the “laissez faire” approach to the original version (Walker and Myrick, 2006) and the analysis frameworks are suitable for exploring actions and experiences.

Grounded Theory is applied across a study and not just to analysis. Within their theoretical framework, Strauss and Corbin advocate an awareness of and use of the literature in order to sensitise the researcher to alternate possibilities (Strauss and Corbin, 1990). Although this has been criticised (Glasser and Strauss, 1967, Glasser, 2002), in arguments far beyond the scope of this thesis, there is no evidence to contradict the use of this approach (McGhee et al., 2007). In view of this, Grounded Theory is a suitable methodological approach for developing an understanding of emotions, behaviour and experience.

#### **1.4.15. Measurement of implicit emotion**

As discussed, it is considered that individuals do not detect all emotions and so implicit emotions can be different to explicit emotions. Implicit emotions have been associated with behaviour for example. Asendorpf et al. (2002), showed that whilst explicit measures of “self” could predict controlled behaviour, implicit measures were more effective for predicting spontaneous behaviour. These differences may reflect limitations of self-report, for example the difference between a true response and responding in a way that improves self-presentation (Baumeister, 1982). It may also reflect differences in emotional intelligence (Salovey and Mayer, 1989, Goleman, 1996, Meyer et al., 2004) and variations in the awareness of emotions. As a

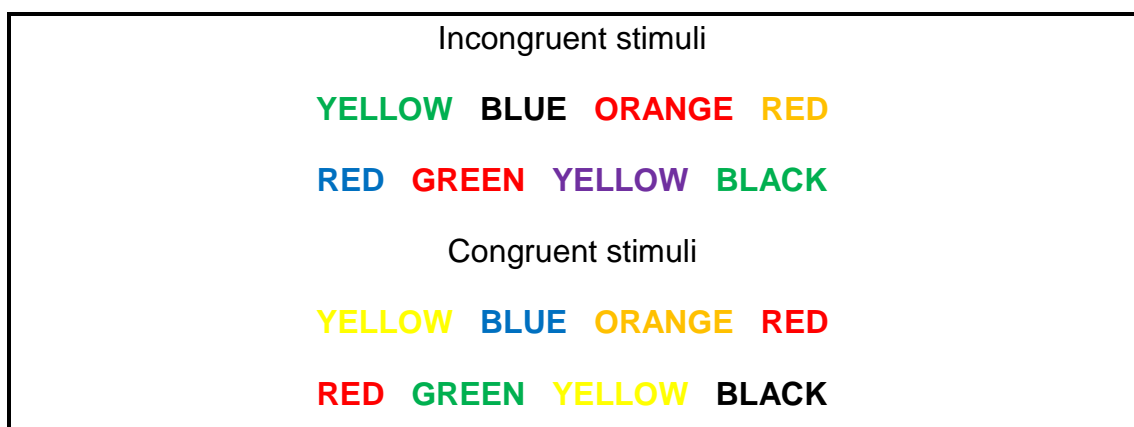
result of these limitations, self-report may not capture all emotional experiences.

As previously discussed, emotional events can also be measured and quantified using non-verbally expressed reactions and physiological responses (Mauss and Robinson, 2009). Physiological and behavioural responses can be used to detect emotional responses even when a participant is not consciously aware of their emotional reactions. These responses can be used for emotional reactions below conscious awareness, which may predict behaviour.

#### 1.4.16. Stroop test

The Stroop test is a term used for a range of tests that originated in 1935 (Stroop, 1935). The original tests, involved the use of words for colours, printed in different colours of ink. Tests involved exercises where the words were the same colour as the ink and exercises where words were a different colour from the ink (Figure 1.1). In these tests, participants were asked to read the words ignoring the ink and they were given exercises that involved saying colour of the ink. Response times were longer for naming the ink colour when the word and ink colour were different (incongruent) and this was named the Stroop effect. This effect is well established but the mechanisms have been debated since the original publication (MacLeod, 1991), yet no conclusion has been reached.

**Figure 1.1 Illustration of a Stroop test example**



Emotional variants of the Stroop test have been developed using emotion words and images. In a review of the Emotional Stroop effect (Williams et al., 1996), a range of studies using subjects with specific anxieties, demonstrated response latencies to words and images associated with these anxieties, for example, spider phobics and words associated with spiders. As with most Stroop Test studies, there is considerable debate about the reasons and mechanisms for this effect, for example, Mogg et al. (1989) suggested that this effect occurs because more attention is given to emotional information. Dawkins and Furnham (1989) however argued that resources are finite and the effect arises because more resources are needed to deal with emotional information, although interesting, these debates are beyond the scope of this thesis.

Emotional Stroop effects are predominantly associated with negative emotional stimuli (Van Hooff et al., 2008) and Cohen et al. (1990) argued this is because there is a selective attentional bias towards threatening stimuli however, the effect is also seen with strong positive emotions towards a stimulus (Williams et al., 1996) demonstrating a relationship between emotion and the Stroop effect.

Although it is possible that the Emotional Stroop test does not provide a direct measure of emotion, emotional brain activity is seen by functional magnetic resonance imaging of the brain during Emotional Stroop tests in conjunction with the effect (Compton et al., 2003). Irrespective of the mechanisms, it is considered that emotional Stroop reactions are sensitive and specific to individual concerns (Mathews and Klug, 1993, Riemann and McNally, 1995) and so are useful for measuring the presence of negative emotions towards oral care stimuli.

#### **1.4.17. Heart rate and emotion**

Emotional reactions are associated with changes in heart rate (Damasio, 1999, Lane et al., 2009). Although changes in heart rate are not exclusive to emotional activity, increases in heart rate have been associated with both

self-reported emotions and emotional brain activity (Damasio, 1999, Moll and de Oliveira-Souza, 2007). Changes in heart rate can therefore provide a useful adjunct to studies to supplement other measures of emotion.

#### **1.4.18. Implicit Association Test (IAT) responses**

Individuals can hold positive and negative attitudes towards concepts, experiences and stimuli, which, as discussed, can be expressed both explicitly and implicitly. The Implicit Association Test (Greenwald et al., 1998) is used to assess the 'relative strengths of association' between two concepts (Nosek et al., 2005) and can detect sub-conscious associations. Implicit attitudes have been associated with how emotional information is processed and this relationship is seen in IAT tests (Williams and Themanson, 2011).

The IAT involves the delivery of a series of tests using images and words. This test is predominantly delivered by computer but pen and paper versions have been used in studies. Images used in the tests normally fall into one of two categories under test, for example in race versions of the test images can be European American or African American faces. Participants categorise test images using computer keys in a series of tests and the time to respond for each is recorded. During tests, image stimuli are categorised into target categories, which are words to denote the stimuli, for example European American or African American. Images are also categorised by attributes for example good or bad (Duncan and Schaller, 2009). These tests are interactive and undertaking them makes them easier to understand. Practice tests are available from Project Implicit (Project Implicit, 2011). Greater response times are considered to show greater implicit associations.

The IAT is an established test which has been used successfully for looking at emotional disgust in relation to illness (Duncan and Schaller, 2009) and to dermatological skin conditions (Grandfield et al., 2005). Both studies showed people's preferences for disease free appearances. This test is

adaptable to clean and unclean oral care states and is therefore a useful test for examining implicit reactions towards oral care stimuli.

This evidence demonstrates a range of methodological approaches for the capture and measurement of both explicit and implicit emotions. Each approach has strengths and limitations and a combination of approaches may best capture the nature of emotions towards experiences and events.

#### **1.4.19. Summary**

In summary, patients in hospital can be very unwell and oral care for these patients is important for both patient health and oral health. The UK population is ageing and along with this, people are keeping their teeth into old age. This has implications for nurses in hospitals as more patients in hospitals will need help with oral care. These patients do not necessarily receive the basic good oral care that is required for all. As a consequence, oral health in hospitals is poor, putting patients at risk of serious respiratory infections. Nurses and care staff are responsible for ensuring that patients have good oral health; it is clear that there are barriers to the provision of oral care in hospitals which include negative attitudes amongst care staff towards care of the mouth and difficulties in dealing with resistant behaviours from patients. Negative attitudes include unpleasantness and anxieties towards oral care; although improving attitudes may improve denture and subsequently soft tissue care it does not improve intra-oral brushing.

Emotions underpin experiences of anxiety and disgust; furthermore emotions are associated with behaviour. It is therefore possible that these emotions are involved in oral care but emotions towards oral care have not been explored. Explicit and implicit emotions can be measured and examined in relation to behaviours using psychological study methods but these are designed for specific emotions. As no existing measures for emotions towards oral care are known to exist, studies to examine the relationship between oral care and emotion may first need to examine the range of



emotions involved and then measure these emotions using established methods and theories.

#### **1.4.20. Conclusion**

The evidence suggests that negative emotions may exist towards the mouth and its care. As unpleasant emotions are associated with avoidant behaviours it is possible that emotions affect the quality of care provided for patients. Nurses' emotions may therefore help us to understand why improving attitudes towards oral care do not improve the oral care given to patients. Therefore nurses' emotions may be important for the provision of oral care and should be explored using a range of methodological approaches for emotional data.

## **1.5. Overall aims and objectives of the thesis**

### **Aim**

To understand how nurses' and student nurses' emotional experiences and reactions influence the provision of oral care for hospitalised adult patients.

### **Objectives**

Describe the range of nurses' and student nurses' emotional experiences towards nursing care for the adult mouth in hospital.

Identify nurses' and student nurses' perceptions of their roles and responsibilities towards patient oral care.

Examine nurses' and student nurses' explicit emotional experiences of oral care.

Explore student nurses' implicit emotional experiences of oral care.

Develop an understanding of the relationship between nurses' and student nurses' implicit and explicit emotions and oral care behaviours for adult patients in hospitals.

### **1.5.1. Aims and objectives for study 1 part 1**

#### **Aim**

Explore nurses' and student nurses' emotional constructs and experiences towards daily oral care in hospitalised adults.

#### **Objectives**

Understand the emotional meaning of the oral cavity and its care for nurses, student nurses and HCWs.

Investigate nurses', student nurses' and HCWs' emotional constructs and experiences of providing oral care for hospitalised adults.

Illuminate the relationship between nurses', student nurses' and HCWs' emotions and their roles in daily oral care for hospitalised adults.

Identify which emotional constructs and experiences of oral care are relevant to nurses and student nurses.

### **1.5.2. Aims and objectives for study 1 part 2**

#### **Aims**

Understand student and qualified nurses' individual emotional constructs and experiences of oral care and how these influence oral care for their patients in hospital.

#### **Objectives**

Explore individual student and qualified nurses' roles, emotional constructs and experiences of providing oral care for their hospitalised adult patients.

Understand individual student and qualified nurses' perceived roles and responsibilities towards oral care for their adult patients.

Develop an understanding of the relationship between student and qualified nurses' emotions and nursing oral care behaviours for adult patients in hospitals.

Test the theory developed from the first stage of qualitative research with data from individual student and qualified nurses working different areas of hospital practice.

### **1.5.3. Aims and objectives for the pilot studies**

#### **Aim**

Develop and test methods to measure student nurses' emotions towards mouth care for hospitalised adult patients.

#### **Objectives**

Develop and test images, a scenario, questions and measurement scales for a questionnaire to measure student nurses' explicit emotions towards mouth care for hospitalised adult patients.

Pilot a questionnaire tool to capture and measure emotions and mouth care behaviour for hospitalised adult patients.

Develop and pilot Stroop and heart rate tests for the capture of student nurses' implicit emotional responses to oral care stimuli.

### **1.5.4. Aims and objectives for the mixed methods studies**

#### **Aim**

Examine and compare student nurses' explicit and implicit emotional responses towards oral care for hospitalised adult patients.

#### **Objectives**

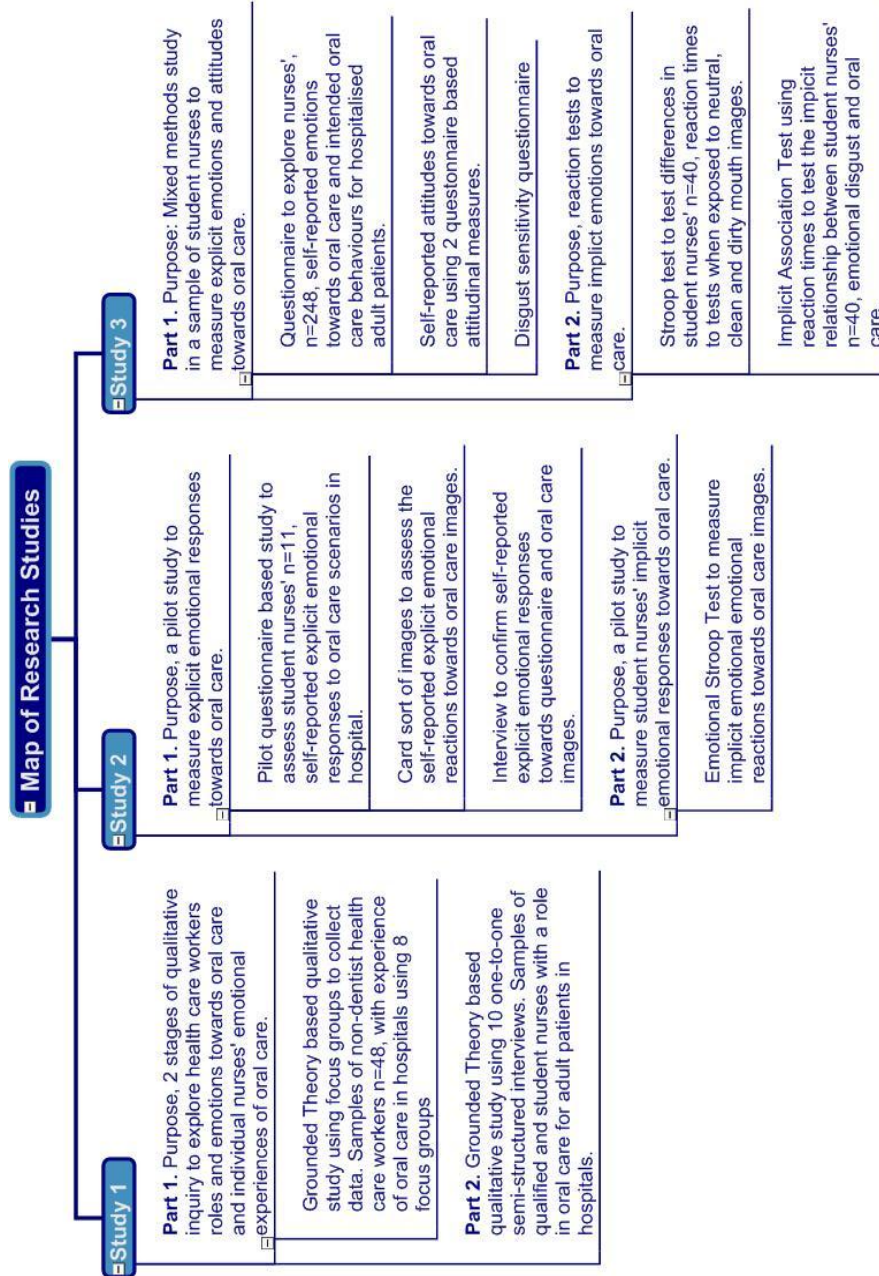
Collect and examine student nurses' explicit emotional responses to oral care using a questionnaire-based tool

Explore the relationship between emotional predisposition to emotional disgust and emotional responses to oral care.

Measure student nurses' implicit reactions to oral care stimuli with Stroop and implicit association tests.

Compare student nurses' explicit and implicit emotional reactions to oral care.

Figure 1.2 Illustrated thesis map



# Chapter 2

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## **2. Qualitative exploration of healthcare workers' emotions towards oral care for adult patients**

### **2.1. Introduction**

This chapter describes the first study in this thesis. It outlines preparations and methods for the first stage of data collection using focus groups and the second stage of data collection using one-to-one semi-structured interviews. This is followed by a description of study findings and a discussion of the methods and results. This chapter concludes with a summary of the findings, an outline of study limitations and suggestions for further studies leading to the third chapter of this thesis.

### **2.2. Preparation for the studies**

#### **Personal development**

For this research, a process of personal development was undertaken in order to ensure the studies were carried out with methodological rigour. This included developing an understanding of methodologies and techniques for qualitative and quantitative research. Personal development also involved self-directed learning, attendance at training courses and the acquisition of specific knowledge and skills.

#### **Self-directed Learning**

Qualitative research books were used to develop an understanding of qualitative methodologies (Strauss and Corbin, 1990, Smith, 2003, Silverman, 2005, Charmaz, 2006) focus groups (Krueger and Casey, 2000, Fern, 2001) and interviews (Kvale, 1996, Kvale, 2007). Literature describing studies which used focus groups and interviews for nursing and oral care were also examined (Redford and Gift, 1997, Wardh et al., 2002a, De Visschere and Vanobbergen, 2006, Paley et al., 2009).

Psychological text books and literature articles relating to the techniques for emotion measurement (Matsumoto et al., 1991, Kazarian, 1992, Moore et al., 1999, Granato et al., 2002, Hozjan and Kacic, 2006, Mauss and Robinson, 2009) were used to develop an understanding of psychology, emotion and research in psychology.

### **Training Courses**

Training opportunities for qualitative and quantitative research methods were identified from course guides and advice from researchers. Training included research governance and Good Clinical Practice courses. Two qualitative techniques courses; one for generalized qualitative techniques and the other for methods and techniques for focus groups and interviews were undertaken. These included opportunities to observe focus group and interview interactions.

Training in software for qualitative analysis and NVivo software was completed along with self-directed learning using an NVivo course guide, online NVivo instructions and the recommended textbooks (Lewins and Silver, 2007). Further self-directed learning using articles (MacLean et al., 2004, Bailey, 2008) describing techniques for data transcription was carried out in order to develop the skills.

Training in statistics and the use of SPSS version 18 software (IBM Inc, New York, United States of America) for data analysis was undertaken during a quantitative methods course. Courses were attended for the use of R (R Development Core Team, 2011), Ggobi (Swayne et al., 2008), and Mondrian (Martin, 2011) software packages.

### **Further personal development**

Courses were underpinned by self-directed learning. A greater understanding of qualitative methodologies was also developed through attendance at a qualitative research in health methods group, which involved presentations and discussions about methodology on a monthly basis.

Quantitative and qualitative computer analysis techniques were further developed through a multidisciplinary R statistical software user group.



Further development in psychological research was developed through visits to the School of Psychology. This involved attending and giving research presentations within the School of Psychology. It also included visits to researchers undertaking emotion research and participating in reaction time tests.

## **2.3. Methods for Study 1**

### **Introduction**

This section describes the focus group methods used in the first part of the initial study in this thesis and the one-to-one interview methods used in the second part. It outlines the preparation, planning, sampling, recruitment, data collection and analysis procedures and leads into the results of the study.

### **Development and production of a question guide**

A question guide was produced for the focus groups in the first stage of study. The outline for a focus group guide in Krueger and Casey (2000) was used as the model for the guide (Appendix 2.1). Difficulties that had been previously encountered in focus group research were considered. For example, experienced researchers had encountered problems starting discussions between participants at the beginning of some focus groups. Techniques to overcome potential problems were identified and integrated into the design. The question guide had two parts, firstly an introductory component involving photographs to encourage discussions between participants and secondly, questions to generate data.

### **Introductory component**

The introductory component of the questionnaire involved photographic images of lips, mouths and teeth; the purpose of the images was to encourage discussion relating to the study at the beginning of the focus groups. Photographic images with consent for use in research were selected to represent the mouth. Pictures showed the mouth, lips and teeth, with no other facial features or facial expressions. Younger and older healthy

mouths were included to provide a range of examples. Eight printed photographs were produced, sized to 6x4 and laminated, so they could be handled and physically passed between participants.

### **Questions for Guide**

Open questions (Appendix 2.1) were developed for the question guide using the aims and objectives of the study (1.5). Questions were tested and refined verbally with researchers and healthcare clinicians in the School of Dentistry in accordance with recommended practice (Krueger and Casey, 2000).

### **Ethical approvals**

Ethical approvals for research were obtained from the University of Glamorgan Research Ethics Committee and the South East Wales Research Ethics Committee (Appendix 2.2). Cardiff and Vale National Health Service Trust Research and Development Committee also approved the study.

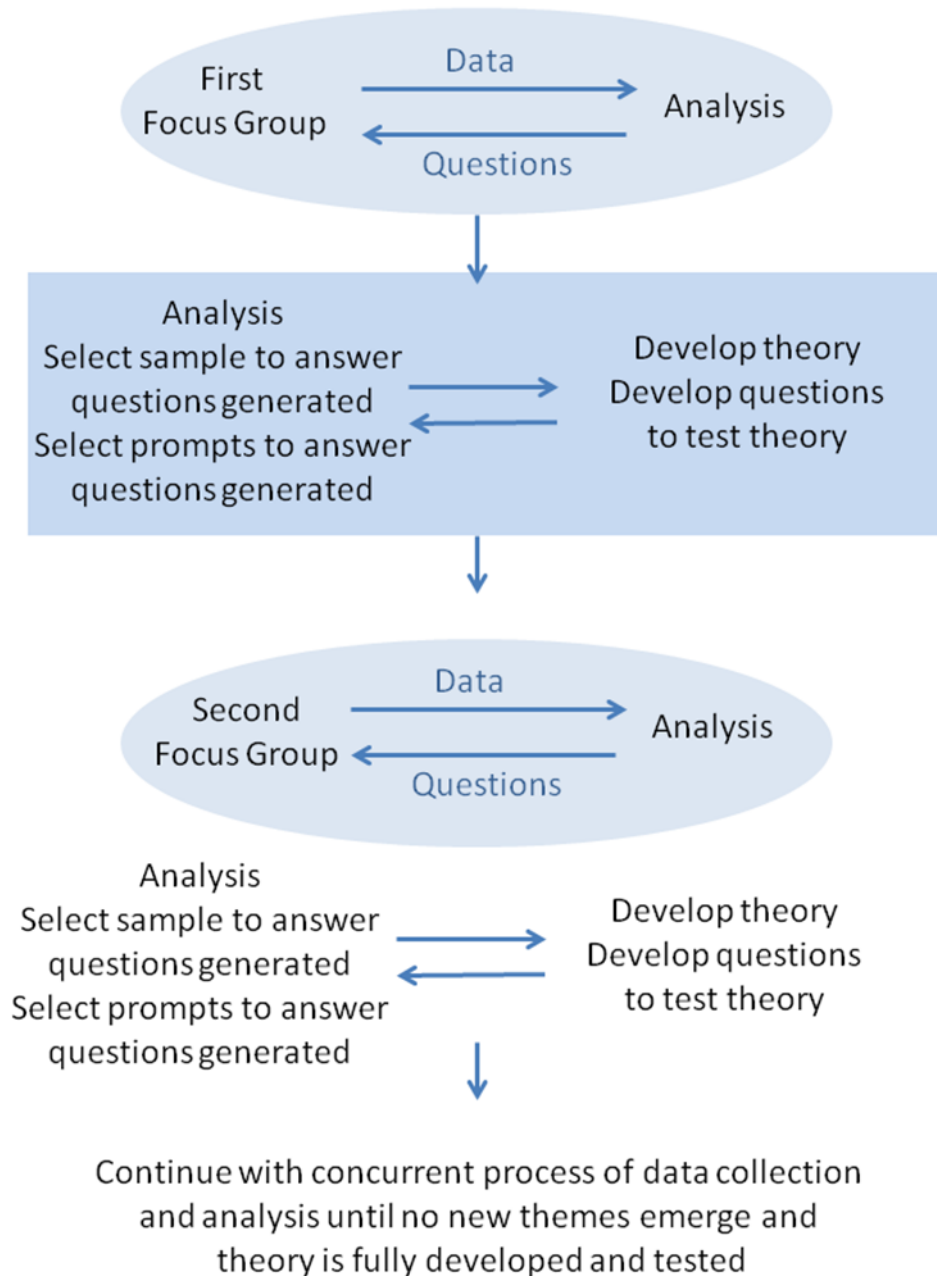
## **2.3.1. Sampling and recruitment**

### **Sample selection**

Participants were chosen using the principles of Grounded Theory theoretical sampling (Strauss and Corbin, 1990). This process commenced with a sample of student nurses who were selected because they had all received similar training in oral care during their training and had recently undertaken their first placements in hospital wards. Data emerging from the first focus group were considered systematically in accordance with this version of Grounded Theory. Data were examined for context and phenomena and questions were generated from these data, these questions were then used to inform sample selection for each subsequent group. This process continued until no new themes emerged; the theoretical process for this is outlined in Figure 2.1. The selected sample included student nurses, qualified nurses from both medical and surgical wards and student

hygienists. The sampling process and sample used in the study is described in Table 2.1.

**Figure 2.1 Illustration of the theoretical sampling process used in the study, based on Strauss and Corbin (1990)**



**Table 2.1 Illustration of the theoretical sampling process, group features, sample description and justification of sample**

<b>Group</b>	<b>Features of Group</b>	<b>Description of participants in sample</b>	<b>Brief justification of sample and procedures</b>	<b>Procedures</b>
1	Number of Participants:5 All female Age 20-50 Relationships: Knew each other through course of study	Student nurses year 1, from a single University All had undertaken first placement on ward (this sample included students who had experience of working as care assistants)	Initial sample to examine range of responses to oral care in a cohort of student nurses with similar background and training experience. Further group in the same cohort selected for next sample.	5 questions  10 probes used
2	Number involved: 5 All female Age 20-40 Relationships: Knew each other through course of study	Student nurses year 1, From same population frame as group 1, all had undertaken first placement on ward (this sample included students who had experience of working as care assistants)	Second sample from same cohort to understand which responses were similar, which were new and which were not similar to the previous group. Procedure adjusted to use more probes for further detail. Absence of male participants noted Further group containing more male participants in the same/similar cohort selected for next sample.	5 questions  17 probes
3	Number involved: 3 2 male 1 female Age 20-45 Relationships: Knew each other through course of study	Student nurses from a cohort of student nurses 6 months ahead of the sample in group 1 and 2 (this sample included students who had experience of working as care assistants)	Predominantly male group in similar cohort to previous groups to examine similarities and differences in responses. To reduce missing data, at the end of the focus group participants were invited to give further comments. To reduce errors in analysis participants were invited to respond to a summary from the researcher. As a student nurses' role in care role appeared to be important for emotions, a sample student hygienists was selected to better understand which responses related to being a nurse or student nurse. This was to understand whether student nurses were fundamentally different to hygienists in their perceptions, roles and emotions. It was also to see student nurses and hygienists if they dealt with their emotions towards oral care in the same way.	6 questions  11 probes

**Table 2.1 Illustration of the theoretical sampling process, group features, sample description and justification of sample**

<b>Group</b>	<b>Features of Group</b>	<b>Description of participant sample</b>	<b>Brief justification of sample and procedures</b>	<b>Procedures</b>
4	Number involved: 4 1 male 3 female Age 18-30 Relationships: Knew each other through course	Student hygienists in the second year of study with experience of working as a hygienist on clinics and providing oral hygiene care and treatment for over a year.	Student hygienists were selected as a comparison group in order to examine differences and similarities in responses with the previous groups. This was to understand why hygienists could and did carry out oral care whereas student nurses' did not always do this. The selected student hygienists were at a similar stage of training to the student nurses in the study. Two questions not asked, as questions generated automatically by participants in discussion.  Experience raised by both student nurses and hygienists, qualified nurses with experience of care selected to help understand how experience does and does not influence emotions and care.	Questions 4 Probes 24
5	Number involved: 7 With an 8 <sup>th</sup> arriving during the group. Age 30-50 Knew each other well	Experienced qualified nurses from multidisciplinary backgrounds. With experience of an expressed role in oral care	Group to explore the responses of in qualified nurses with more, experience (higher grades) to see whether the themes were consistent with students or if new themes were generated. Probes used for more detail but questions answered automatically by participants.  A second group in a cohort of qualified nurses who worked on the wards selected to help examine and understand findings from previous group.	3 questions 10 probes
6	Number involved:10 Age 25-55 All female. Some of the group knew each other.	Experienced qualified nurses of a multi-disciplinary background	Group to explore the responses of in qualified nurses with experience (mid and low grades) to see whether the themes were consistent with students or experienced nurses. This was to test the emerging theoretical model. The group was larger than ideal and shorter in duration to space being made available on a study day for this group. The conduct was the same as previously. No new themes emerged.  A second group of hygienists was selected to help examine and understand findings from previous group of student hygienists.	6 questions 15 probes

**Table 2.1 Illustration of the theoretical sampling process, group features, sample description and justification of sample**

<b>Group</b>	<b>Features of Group</b>	<b>Description of participant sample</b>	<b>Brief justification of sample and procedures</b>	<b>Procedures</b>
7	Number involved: 4 All female. Knew each other well	Student hygienists	Group recruited to compare and confirm themes with the student hygienists in the previous hygienist group. Also to compare student hygienists to qualified nurses and student nurses. This was to allow further exploration of individuals who have an explicit recognised role within the mouth. No new themes emerged. A group of intensive care nurses was then selected to test the theoretical model because they deal with totally dependent patients.	6 questions 6 probes
8	Number involved: 2 All female. Knew each other well	Qualified ITU nurses	This group was smaller than previous groups as one of the participants was unable to attend on the day. Conduct remained consistent, maintaining the end question inviting comments. No new themes emerged.	5 questions 10 probes

## **Recruitment of participants**

Networks to conduct the research were established with nurses at the University of Glamorgan and Cardiff and Vale NHS Hospitals Trust. Staff at each site provided assistance with identifying times and places to invite participants and with booking suitable rooms for focus groups.

The first stage of recruitment was undertaken at Glamorgan University. A verbal invitation was issued to the first year student nurses at the end of a lecture. Participant information sheets (Appendix 2.3) including a copy of the consent form were distributed. Students were invited to ask questions as a group or individually after the announcement; details were provided to allow further information to be obtained if required. Volunteers provided a contact number or e-mail address that was used to confirm the date and venue for the focus group and the receipt of participant information. Contact details were managed as confidential data. These procedures were also followed for student hygienists within Cardiff University School of Dentistry.

In Cardiff and Vale Hospital NHS Trust, two research nurses identified groups of qualified nurses, issued invitations to participate and distributed participant information. Two groups of nurses with pre-arranged meetings agreed to participate. One further group was convened at a later date. Informed consent was obtained and recorded for all participants.

### **2.3.2. Data collection and preparation**

#### **Focus group procedures**

A similar environment was created for each group in accordance with recommended methods (Morgan, 1997). Focus groups were carried out in hospital and university tutorial rooms and each group was carried out during a lunch period. Chairs were arranged in advance of the focus groups in a circle. A single moderator who was a dentist moderated the groups. Participant information included the moderator's job title, which was clinical lecturer in the School of Dentistry and so all were made aware that the

moderator had a dental role. The moderator consciously attempted to maintain consistency of dress and conduct for each group.

### **Focus group introduction**

Each group commenced with a brief introduction. Basic ground rules were outlined in accordance with recommended practices (Krueger and Casey, 2000). All views were encouraged and participants were instructed to take turns to speak. At the outset of each group, participants were asked to treat the information shared within the group as confidential.

### **Ordering of questions in response to data**

In accordance with Grounded Theory approaches, procedures were developed in response to data (Strauss and Corbin, 1990) in order to better generate answers to questions arising from data and to test emerging theory. Changes made were to change the order of the questions, for example, focus group discussions varied and participants naturally introduced topics during some groups. The moderator made adjustments to the order of the questions set out in the question guide to accommodate this, as outlined in Table 2.1. Also, the moderator found that participants spoke more easily about their own mouths when it was raised later in the group and so the order of the questions was changed in the fourth group to improve the quality of the responses.

At the end of the third and in all subsequent groups, a summary was given and further comments were invited before recording was stopped. This summary included major points that the moderator identified during the group. Participants were invited to add comments, clarify details and discuss whether the summary reflected their views. The focus group was concluded at the end of the natural conversations between the groups or at the end of one hour, as the focus groups were arranged during lunch breaks to fit in with participant schedules. No group lasted beyond an hour.



## **Recording and transcribing of data**

Focus groups were recorded using a Sanyo ICR-B130 digital voice recorder, positioned visibly in the centre of the group. For each group, recording commenced immediately after instructions on conduct (Krueger and Casey, 2000) had been issued. Recording was stopped at the end of each group. The moderator wrote down reflections immediately after each group.

Focus groups were transcribed verbatim, this process was informed by papers outlining techniques for transcribing data (MacLean et al., 2004, Bailey, 2008). Laughter and other non-verbal sounds were noted at the point of occurrence. In accordance with the participant information sheets (Appendix 2.3), data were anonymised by using pseudonyms for each of the participants. Where it was not possible to identify the individuals speaking from the recording, a descriptive term for example “nurse” was used at the beginning of the sentence to indicate when a new person was speaking. PC Memoscriber for ICR-B130 version 3.2 was used for audio playback. Data were manually typed into Microsoft Office Word 2003, version 11.8169.8172 SP3 (Microsoft, Redmond, United States of America) for the first two groups. Subsequent groups were transcribed using Scansoft Dragon 8 Naturally Speaking Preferred version 8.00.0085, to verbally transcribe audio into textual data.

### **2.3.3. Analysis**

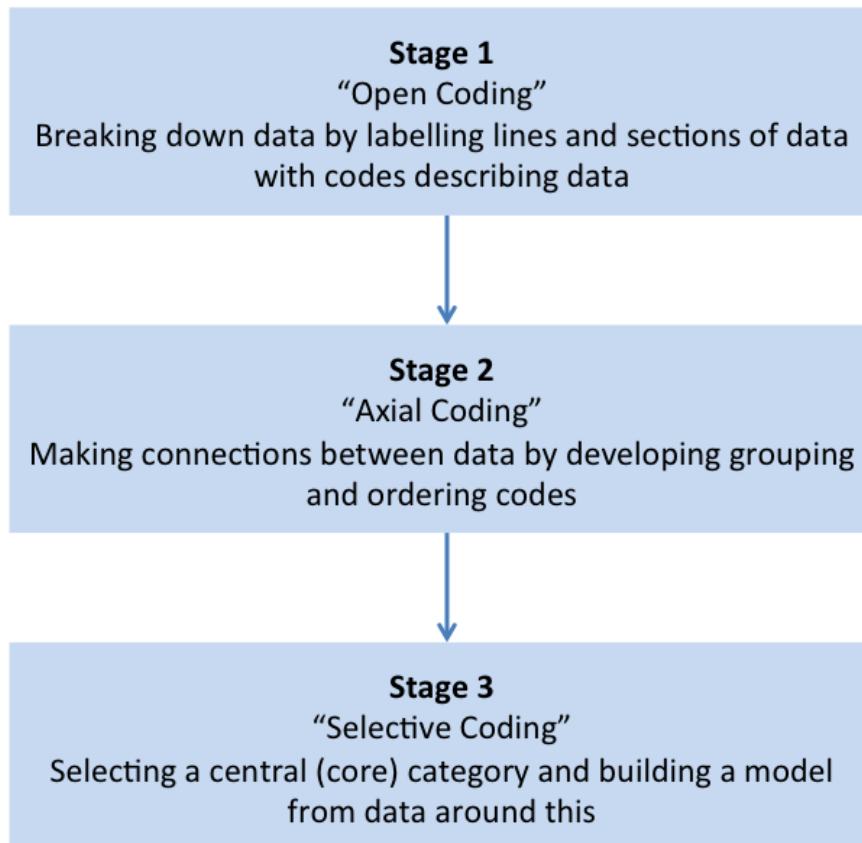
Analysis was carried out in a number of stages, in accordance with Grounded Theory (Strauss and Corbin, 1990). These stages (Figure 2.2) are described in this section. This involved concurrent data collection and analysis (Figure 2.1). In addition, word frequency and word usage analysis was used to examine the terminology used for oral care.

The researcher who had moderated and transcribed data for the focus groups undertook all stages of analysis. The researcher made reflective notes about how the groups and data collected had influenced their perceptions during the process of data collection and analysis. This was

undertaken in order to be explicit about potential bias arising from the researcher.

Participants did not verify analyses, as participant identities were anonymised and so it was not possible for participants for comment on transcripts or analyses.

**Figure 2.2 Coding stages, illustration based on Strauss and Corbin (1990)**



### **Open coding**

The first stage of analysis involved open coding, systematically breaking down data. Lines of data were considered in turn. Descriptions, terms and

words were analysed to produce named codes. Memos, describing data, comparisons and concepts arising from data were generated throughout analysis. Initial coding was carried out during transcription and then transcripts were open coded manually with paper transcripts for the first five groups.

The process of analysis used coding frameworks whilst examining data (Strauss and Corbin, 1990). Frameworks included: Who?, Where?, How much? and Why? Psychological textbooks and articles were used during the process of analysis to allow sensitisation to established concepts during analysis.

Textual transcripts were uploaded for use in NVivo 8, (version 8.0.335.04 SP3. QSR, Melbourne) Lines and sections of data were open coded using the software. This involved electronically highlighting individual lines and sections of data and tagging them with named codes. Manual analyses were uploaded and refined. During analysis, new headings were generated as required. Codes were merged where they had similar meaning. The process of coding automatically generated electronic files, known as NVivo nodes for each of the headings. This process continued until all transcripts had been analysed and nothing new emerged.

### **Axial coding**

The second stage of analysis, termed axial coding, commenced after open coding. Manual printed copies of each NVivo code heading were produced to assist analysis. The content of electronic files for each heading were examined in turn and the paradigm model (Strauss and Corbin, 1990) was used to develop and bring concepts together. New concepts, called categories were generated through this process.

## **Selective coding**

In the final stage of coding (selective coding), categories were considered systematically in turn. The core category, which was central to and affected all data, was then identified. Categories were analysed in turn and arranged around this central theme. In accordance with theoretical sampling methodology, samples were selected to generate data to test the emerging theory.

Word frequencies for transcripts were generated using NVivo 8 (version 8.0.335.04 SP3, QSR, Melbourne) and exported to Microsoft Excel 2007 (Microsoft, Redmond, United States of America) for analysis. Non-descriptive words such as “THE” and “AND” were removed from analyses in addition words with ambiguous or unclear meanings were excluded from analyses. Words were sorted into meaningful categories. To assist analysis, NVivo 8 was used to retrieve lines of data where frequent words were used so that the context of language use could be examined. The 200 most frequently occurring words (excluding non-descriptive terms) were analysed according to content and meaning.

## **Review of findings**

In accordance with the methodology (Strauss and Corbin, 1990), findings were reviewed throughout the analyses. The aims and objectives of the thesis participants and methods were considered as part of this process.

Study limitations were identified. Specifically, data lacked individual level detail of complete experiences, in addition, views expressed during the groups may have been limited to those that HCWs were aware of and felt happy to share within a social situation. Comparisons between responses were also considered to be difficult because participants were not responding to the same questions or prompts stimuli.

Individual level qualitative data were considered for further investigating and comparing nurses' individual emotional experiences of oral care to supplement focus group data (Kvale, 1996, Kvale, 2007). A further stage of qualitative inquiry on a one-to-one level was selected for this purpose.

## **2.4. Methods for the second stage of data collection**

### **2.4.1. Introduction**

The initial stage of qualitative research used focus groups; however, as discussed, data arising from these techniques lacked individual level detailed experiences. This section describes the preparations and methods for the second stage of data collection, which was undertaken using one-to one semi-structured interviews.

#### **Question guide**

The focus group question guide (Appendix 2.1) was used to develop a question guide for semi-structured interviews (Appendix 2.4) using literature and advice outlined in section 2.2. Results and responses from the focus groups (Section 2.5) were reviewed and changes to the wording of the questions were made. The question guide was then sent to University research staff in order to check face validity of the questions. These changes were made in order to encourage participants to describe their experiences in depth; prompts for emotional feelings were retained. Pictures to initiate discussions between participants were removed because no group interaction was involved.

#### **Ethical approval**

Applications for a major amendment were submitted to the National Health Service South East Wales research ethics committee and the University of Glamorgan Research Ethics Committee. The NHS Research Ethics Committee and Cardiff University then approved the amendment.

#### **Sample selection and recruitment**

Sample selection was undertaken using theoretical sampling techniques from the focus groups. The sample selected, an outline of reflections and the justification for each participant are outlined in Table 2.2. The selected sample included new student and qualified nurses who were new to the study. A small sample of student nurses from the focus groups was also

included. Qualified nurses in the study worked on stroke care wards and intensive care wards.

**Table 2.2 Overview of interview participant characteristics, justification of the sample and reflections arising from the interview which were used for theoretical sampling for subsequent interviews**

Interview no:	Features of Participant	Justification of sample and procedures	Brief reflections and influence on further sample and procedures
1	Female Age group: 30-40 Year 2 student nurse Participated in focus group previously	Initial sample to explore individual experiences of oral care following the focus groups	Themes arising: Care as routine nursing procedure, emotional disgust, unpleasantness, motivation to provide care and anxieties providing care. Procedure: The questionnaire guide appeared to be well understood and descriptions arising in response to questions appeared to confirm this. Findings agreed with the focus groups. To explore and confirm findings from this interview, a further interview in a participant with similar experience was considered necessary.
2	Female Age group: 30-40 Year 2 student nurse Participated in focus group previously	Second sample from same cohort of student nurses as first interview with similar background and training experience. To understand which responses were similar, which were new and which were not similar to the previous interview.	Themes arising: Care routine and role, emotional disgust, unpleasantness, motivation to provide care, anxieties providing care, emotional rewards and conflict with care being uncomfortable for the patient. Procedure: The questionnaire appeared to be well understood and descriptions arising in response to questions again appeared to confirm this. Findings fitted with the focus groups. To explore and confirm the individual experiences motivating, rewarding and inhibiting care, a further interview in a participant with similar experience was considered necessary.
3	Female Age group: 30-40 Year 2 student nurse Participated in focus group previously	Third sample from same cohort of student nurses as previous interviews with similar background and training experience. To understand which responses were similar, which were new and which were not similar to the previous interviews.	Themes arising: Care routine and role, emotional disgust, unpleasantness, motivation to provide care, anxieties providing care, emotional rewards and conflict with care being uncomfortable for the patient and patient comfort on a personal and social level. Procedure: The questionnaire appeared to be well understood and descriptions arising in response to questions again appeared to confirm this. Findings fitted with the focus groups. A theoretical model to expand upon the individual motivating and inhibiting factors was developed. As participants in the first 3 interviews had attended the focus groups, student nurses who had not had previous contact with the researcher were selected to explore emotions without previous researcher influence.



**Table 2.2 continued: Overview of interview participant characteristics, justification of the sample and reflections arising from the interview which were used for theoretical sampling for subsequent interviews**

Interview no:	Features of Participant	Justification of sample and procedures	Brief reflections and influence on further sample and procedures
4	<p>Female Age group: 20-30 Year 3 student nurse Had not participated in focus group previously</p>	<p>Fourth sample from cohort of student nurses with similar background and training experience to previous interviews. To understand which responses were similar, which were new and which were not similar to the previous interviews.</p>	<p>Themes arising: Routine initiation of care, initiating care in response to the dirty mouth, not all patients considered to need assistance, unclean mouth was “horrible” for the patient, anxious of hurting the patient during care and motivation to clean. Procedure: The themes from this interview reflected those of previous focus groups and interviews but prompts provided additional detail A further sample from the same cohort without previous participation in the focus groups was selected as a result of this interview in order to test the developing model, confirm and explore the findings from this and previous interviews.</p>
5	<p>Female Age group: 20-30 Year 3 of study Had not participated in focus group previously</p>	<p>Fifth sample from cohort of student nurses with similar background and training experience to previous interviews. To understand which responses were similar, which were new and which were not similar to the previous interviews.</p>	<p>Themes arising: Routine initiation of care, initiating care in response to the dirty mouth, not all patients considered to need assistance, unclean mouth was physically and socially unpleasant for the patient, anxious of hurting the patient during care, working to overcome an aversion to cleaning the mouth and motivation to clean. Themes from this interview reflected those of previous focus groups and interviews. The relevance of experience and “needing to provide care” appeared relevant and important. Although the reasons why care was provided were commonly described, the process of needing to provide care and being able to provide care appeared to be important and less well explored. Experienced nurses were therefore selected for the next sample. The next sample was therefore selected from an area where the evidence showed a clear need to provide oral care and oral care was considered to be good practice to explore how nurses managed to provide (or did not manage) care.</p>

**Table 2.2 continued :Overview of interview participant characteristics, justification of the sample and reflections arising from the interview which were used for theoretical sampling for subsequent interviews**

Interview no:	Features of Participant	Justification of sample and procedures	Reflections and influence on further sample and procedures
6	Female Age group: 30-40 Qualified nurse Intensive care	Qualified nurse working in intensive care to understand the differences and similarities in emotional response to oral care between qualified and student nurses.	Themes arising: Oral care routine for all patients (not some), physically difficult task, could cause harm, anxieties and the need for more than one person to carry it out, unpleasantness and reward. Although this was a different situation, underlying arising were very similar to those described by the student nurses. A second participant from a similar population was therefore selected to further develop the theoretical model and examine this further.
7	Female Age group: 30-40 Qualified nurse Intensive care	Qualified nurse working intensive care in the same unit as the previous participant (who had until recently worked in general nursing wards)	Themes arising: Routine for all patients (not some), physically difficult task, could cause harm, anxieties and the need for more than one person to carry it out, unpleasantness and reward. She compared her experiences in intensive care with those on the wards and described the time constraints in providing good care on the wards. Themes arising were very similar to those described by the student nurses. No new themes emerged. She also described a greater need within intensive care due to patient dependence on the nurses for care.  A further stroke care nurse sample was selected to explore emotions and variations in patient dependence in relation to emotions and care.
8	Female Age group: 30-40 Qualified nurse Stroke unit	Qualified nurse working in stroke care the same hospital as the previous participant	Themes arising: Routine for most patients, physically difficult task, could cause harm, anxieties and the need for more than one person to carry it out, unpleasantness and reward. Themes arising were very similar to those described by the student nurses, and qualified nurses in the focus groups and interviews. Themes arising fitted into the theoretical model arising from the interviews. A further sample was selected in the same population to test the model. No new themes emerged.

**Table 2.2 continued: Overview of interview participant characteristics, justification of the sample and reflections arising from the interview which were used for theoretical sampling for subsequent interviews**

Interview no:	Features of Participant	Justification of sample and procedures	Reflections and influence on further sample and procedures
9	Female Age group: 20-30 Qualified nurse Stroke unit	Qualified nurse working in stroke care the same hospital as the previous participant	Themes arising: Oral care routine for most patients, physically difficult task, could cause harm, anxieties and the need for more than one person to carry it out, unpleasantness and reward. Themes arising were very similar to those described by the student nurses, and qualified nurses in the focus groups and interviews. Themes arising fitted into the theoretical model arising from the interviews. A further sample was selected in the same population, with more experience, to test the model. No new themes emerged.
10	Female Age group: 50-60 Qualified nurse Stroke unit	Qualified nurse working in stroke care the same hospital as the previous participant. Nurse with many years of experience.	Themes arising: Oral care routine for most patients, physically difficult task, could cause harm, anxieties and the need for more than one person to carry it out, unpleasantness and reward. Themes arising were very similar to those described by the student nurses, and qualified nurses in the focus groups and interviews. Themes arising fitted into the theoretical model arising from the interviews. No new themes emerged. Themes arising from this interview confirmed previous findings and fitted into the theoretical model arising from the interviews. No further sample selected.

### **2.4.2. Recruitment**

Recruitment used the methods from the focus groups and participant information for the one-to-one semi-structured interviews (Appendix 2.5).

### **2.4.3. Procedures for the interviews**

Interviews were conducted at times, dates and locations that best suited participants. Interviews were carried out in teaching rooms at the university and hospital.

Focus group procedures and semi-structured interview consent forms (Appendix 2.5) were used for consent. Interview question guides (Appendix 2.4) were followed for each participant and prompts were given for further details and participants were encouraged to talk through experiences. Interviews were digitally audio-recorded and pathways for the confidential transfer of transcripts and return of comments were agreed with each participant.

### **2.4.4. Transcription and analysis**

Transcription was carried out using techniques used for the focus groups. Initial analysis commenced during transcription. Strauss and Corbin Grounded Theory (Strauss and Corbin, 1990) was used for analysis and procedures followed those used in the focus groups. In accordance with this methodology, the model developed in the focus groups (Figure 2.3) was tested with the new data. Following further analyses, a model of individual experience was developed to explain individual experiences of oral care.

Following advice from members of the qualitative research group, 30% of codes were selected for double coding using a computerised random number generator. Manual copies of the contents of these codes were given

to a second researcher who was not involved in data collection or analysis, for double coding. The main researcher and the second researcher then discussed and compared their findings.

### **Analysis Software**

Interview data were analysed with the software used for the focus groups (section 2.3.3). The model from the focus groups was tested with interview data. This was carried out with the coding frame developed during the focus group analyses.

Further analyses of data were undertaken to explore emotional experiences of initiation and performance of oral care tasks on an individual level. Coding and word frequency analyses followed techniques used in the focus groups (section 2.3.3).

Mind mapping software (Gael, MindGenius Ltd, East Kilbride, Scotland) was used to help visualise data themes in order to develop the theory.

### **Theory development**

The theoretical model was developed using Strauss and Corbin Grounded Theory (Strauss and Corbin, 1990). Outlying responses and new interview data were used to test and refine the model and the final model was tested with focus group data.

## **2.5. Results from the first stage of data collection**

### **2.5.1. Introduction**

This section outlines the results from the first stage of qualitative enquiry using focus groups. For the purposes of this stage of the study, the term “HCW” is used for student and qualified nurses and student hygienists. Distinctions between these populations are made where necessary.

### **2.5.2. Participants**

A total of 41 HCWs participated in the study, these included 13 student nurses, 20 qualified nurses and eight student hygienists. Four participants were male. Three of the focus groups included male participants. Ten of the student nurses had undertaken their first placements, the remaining three had more than a year of experience on the wards. Student hygienists had at least one year of clinical experience. Eight of the qualified nurses were senior members of staff with management roles, each working in different specialities. Twelve qualified nurses did not have management roles. Of these, ten worked on general medical and surgical wards and two worked in ITU. Personal details including exact participant ages were not recorded in order to help maintain the anonymity of participants and encourage data disclosure. Descriptions of participants including gender and age categories were recorded as part of the notes for each focus group. Ages ranged from early twenties to early fifties, as outlined in Table 2.2.

### **2.5.3. Oral care terminology**

Three main themes of terminology emerged. These were functional terminology, descriptive terms for oral care and terminology for people related to oral care provision.

## Functional terminology

Knowing, thinking, seeing, feeling and doing words were used frequently in the focus groups, these are illustrated in Table 2.3. These words illustrate cognitive and physical functional processes e.g. looking and thought. Specific oral care terms were also identified. These included brushing, cleaning, flossing, and rinsing and indicated a range of functional oral care procedures.

**Table 2.3 List of frequently occurring functional words generated within the focus groups and word frequencies from the transcripts in the qualitative study**

Word	Count	Percentage (%) of word use in transcripts using word length and frequency
know	393	1.14
think	377	1.09
care	144	0.42
look	131	0.38
clean	122	0.35
brush	111	0.32
feel	108	0.31
doing	104	0.30
take	71	0.21
find	68	0.20
give	66	0.19
brushing	64	0.19
make	59	0.17
should	58	0.17
cleaning	56	0.16
need	55	0.16
looking	53	0.15

## Descriptive terminology relating to events

Descriptive terms for oral care included professional language and lay terms for oro-facial anatomy, oral care tools and timing (Appendix 2.6).

## Terms for people relevant to oral care

People relevant to care included patient, nurses, dentists, hygienists, and relatives. Terms relating to describe 'self' and 'others' were also identified (Appendix 2.7).

As shown in Appendix 2.7, some terms are used more frequently than others and descriptions of people involved were used most often. Some words, for example the term floss, had two meanings; dental floss and the act of flossing.

#### **2.5.4. Oral care for healthcare workers**

Self-oral care was described as being different from patient oral care but the terminology used was often the same. Whilst self-performed oral care was an automatic routine daily event carried out without a great deal of thought, oral care for patients was described in terms of making conscious decisions to provide care. Both included a range of procedures but some procedures, for example flossing were not considered as part of nursing care. From these descriptions, oral care in nursing was defined as:

“Interactions, actions and procedures between a nurse or carer and a patient for the purpose of maintaining and improving hygiene in and around the mouth.”

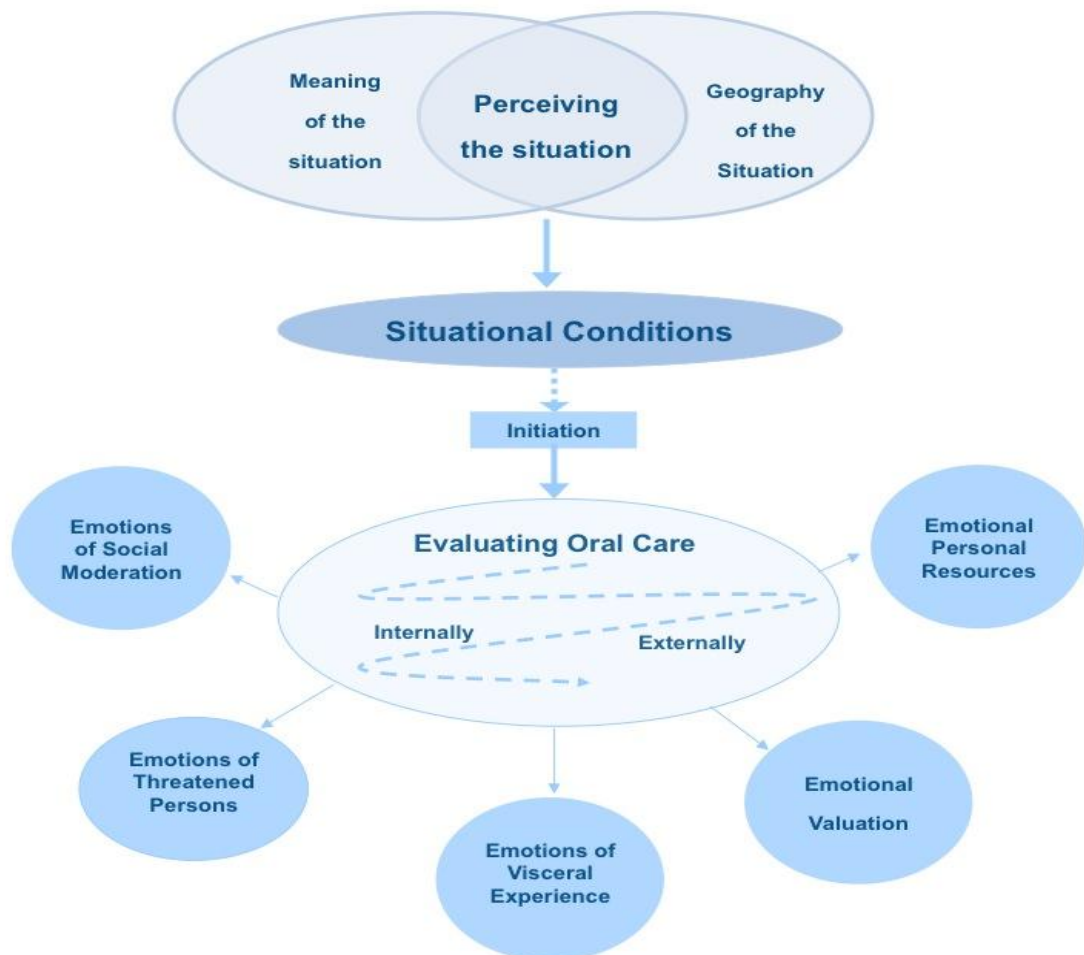
#### **2.5.5. The pivotal role of situational conditions**

The central theme of the study was situational conditions; all emotions identified in the results link to this central theme.

The concept of situational conditions involves two main categories firstly, perception of the situation and subsequently evaluation of the situation. Situational conditions are dynamic and change. These changes influence emotional experiences. Figure 2.3 shows the model illustrating the core category and the related categories of emotions associated with oral care.



**Figure 2.3. Illustration of the first theoretical model developed from analysis of the focus groups**



**2.5.6. Perceiving the situation**

The HCWs’ perception of the situation involves two components; these are the meaning of the situation and the geography of the situation.

### **Meaning of the situation**

Oral care situations can be emotionally meaningful and HCWs' emotions reflect this. The meaning of an oral care situation is contextualised by past and present personal beliefs, values and experiences towards their own mouths and their patients' mouths. The personal meaning and importance of oral hygiene procedures for a nurse is shown below.

**Focus Group 8 Qualified Nurse:** *I'm terrible, I maybe (brush my own teeth) two to three times a day and I always do (my) teeth at night and I always say (to patients) would you like me to do their teeth. They love it and they give me their false teeth. ....It makes them feel better and it makes me feel better because I know what I'm like personally about my own teeth.*

The meanings of situations can be influenced by one's own mouth, the value of oral care routines and personally held attitudes of what is normal and needed.

### **Geography of the situation**

The geography of the situation is the location of an oral care interaction in time place and person. One student hygienist explained how her emotional experiences changed in relation to the geographic setting, as shown below. While spitting in to a spittoon was not an emotional event, spitting in the street had a fundamentally different meaning and evoked disgust.

**Focus Group 7 Student Hygienist:** *"But if I saw someone in the street, without being too disgusting, but if I saw somebody in the street and they spat on the floor, I would feel absolutely sick. But if someone spat into the spittoon it wouldn't even bother me".*

Geography can affect whether a HCW intends to provide oral care for a patient. Care is normally carried out in geographic conditions that are legitimate for oral care and care provision outside this is emotionally unpleasant. Mornings and evenings in healthcare environments, for example the hospital ward are considered legitimate.

### 2.5.7. Initiation as the beginning of care

Oral care is initiated through daily routines or as a reactive response; emotions of initiation are associated with this event.

#### Routine initiation

Oral care can be part of HCWs' routine daily care activities. Routine activities can be unemotional. These routines can also include oral health assessment tools which can prompt and support care action. Where routines are in place, oral care may be initiated for each and every patient however some nurses' care routines omit oral care as described below.

**Focus Group 1 Student Nurse:** *“It was natural for me to, to take notice of their teeth, because it's what we have always done, but it's true actually, on the ward I was on, no-body took no notice of anybody's teeth (laughs), unless. I just found it strange that nobody bothered.”*

Care routines can be during healthcare training or at work; such routines are important and valued. Although routine care is not always emotional, for HCWs who are routine providers of oral care, failing to follow the care routine can evoke negative emotional feelings of concern, guilt or anxiousness towards their patients, as illustrated.

**Focus Group 1 Student Nurse:** *“Being a student I didn't.... take on so many patients. Each patient I would make sure they were thoroughly looked after. I didn't do a half job but I do find that I wish there was more hands on [people around] so we could give that level of care. I felt sorry for the other patients that I didn't do.... Did they get that full [care], you know treatment that lot [the patients]?”*

Care routines can belong to individuals and their ward environments. Differences between a HCW's own routine and the ward routines can evoke conflicts and negative emotions. Some of the HCWs who routinely provided oral care for patients found it difficult to watch others in the ward routinely omitting oral care as shown.

**Focus Group 2 Student Nurse:** *“I noticed that their teeth weren’t being done were they? And when I asked it was like going on to one patient with their basic hygiene, washed, dressed and that, getting breakfast and on to the next person.”*

Others could follow ward routines and omitted oral care but this evoked guilty feelings while choosing to provide care made nurses feel uncomfortable and at odds with their environment. An example of these emotional conflicts shown below was given, by two student nurses who described that when they carried out oral care they were made to feel slow at their job by their peers. Although, this was emotionally difficult for them to do, they felt morally proud that they were doing the right thing for their patients.

**Focus Group 2 Student Nurse 1:** *“Yeah and my routine on the ward would be. Get them washed, dressed. If they were able to brush their hair, while they are brushing their hair I will go and brush their teeth. And then like we would come back and like and they would have finished their hair and I would like have done teeth.”*

**Focus Group 2 Student Nurse 2:** *“They would often think that we were slow.”*

**Focus Group 2 Student Nurse 1:** *“Yeah.”*

**Focus Group 2 Student Nurse 2:** *“Because we were doing it correct. And they would often say oh come on you two coz we hadn’t finished yet.”*

**Focus Group 2 Student Nurse 1:** *“Coz we were checking for em.”*

### **Non-routine initiation**

When oral care is not a routine event, oral care can still be initiated in response to a trigger. One group of nurses discussed how they “just knew” when a patient needed oral care, explaining how they used their instinctive feelings to guide when to provide care. These triggers are described emotionally in terms of patients wanting or needing care. These triggers include patient oral discomfort and patients having problems with eating,

anxieties towards the appearance of the mouth, feelings of something being right or wrong and a sense of unpleasantness on behalf of the patient.

Nurses have different perspectives towards the severity and importance of oral conditions and can be uncertain about when to take action. The thresholds of initiation vary and, as shown, while some nurses report that they initiate care at a very early point of a condition, others only become concerned when conditions become severe.

**Focus Group 5 Qualified Nurse:** *“We don’t have any sort of guidelines for oral care, I think that’s why people flounder with that is because they’re not truly sure what they’re seeing, what is a poorly mouth and what isn’t, as I said with like thrush, rather than catching it in the early stages, we often diagnose it when they’re caked and in pain and they often can’t drink.”*

#### **2.5.8. Internal and external evaluations**

Emotional internal and external evaluations are the emotions towards personally appraising a situation and the emotions of deciding what to do. These evaluations of oral care situations are central to the decisions and actions undertaken by HCWs.

HCWs evaluate each situation using available information. This process involves two inter-related processes that follow the initiation of oral care. Firstly, HCWs internalise and work out how they feel about the presenting oral care situation. Internal evaluations relate to the presenting situation and these evaluations can be focussed on specific elements for example the appearance of the mouth or the patient. Secondly, HCWs evaluate each situation by externalising the information and working out their feelings towards the possible courses of action. One or more emotions can be evoked in relation to possible actions.

Internal evaluations are immediate reactions, whereas external evaluations involve more conscious thought. Although distinct, these concepts are interrelated.

Internal and external evaluations involve interactions between the patient and the carer. These experiences involve five distinct but interrelated categories of social moderation, the threatened person, visceral experience, emotional valuation and personal resources, which will be outlined.

### **2.5.9. Emotions of social moderation**

Oral care is normally carried out in socially acceptable, legitimate environments, and involves interpersonal interactions between a patient and HCW. Emotions of social moderation reflect these social and interpersonal interactions.

Oral care belongs to the patient and HCWs may have a role in this care. Oral care is considered to be a personal, intimate event; it is carried out in close physical proximity to the face, which can be emotionally uncomfortable for both the HCW and the patient. As reflected below, only people with a role permitting access to the mouth can look in the mouth and carry this out on behalf of a patient and HCWs' emotions reflect this.

**Focus Group 3 Student Nurse:** *It's just so personal isn't it, I mean more so than having yourself cleaned [referring to cleaning other parts of the body]. Because I think, like you say, you do it a certain way and if someone does it wrong you think you would feel quite uncomfortable. I just think [cleaning teeth] it's quite invasive.*

Self-oral care is an automatic event for HCWs and because of this, in hospitals it is often assumed that patients will automatically carry out their own oral care if they have the ability to do so. In addition, some HCWs view a loss of independence and needing assistance as being an embarrassing loss of dignity for the patient. Where a patient is deemed to be independent enough to self-care, poor oral hygiene is assumed to be the patient's choice. Offering assistance can threaten a patient's autonomy, independence or dignity. Social and moral conflicts can exist in circumstances when oral care is needed but not wanted. Furthermore going against patient's wishes or leaving the patient in a poor state of hygiene can evoke negative emotions.

HCW care roles affect emotions of social legitimacy towards offering and carrying out oral care. In ICU, patients are often unconscious and dependent on nurses for their care giving ICU nurses a clear role in patient oral care. In these circumstances there is often no question about a patient's capacity to self-care and so intervening in oral care can be both appropriate and morally justified. The sense of need and legitimacy can be reduced where patients are independent.

Hygienists' patients attend for the purpose of oral care and with this they have a clear role in their patients' oral care. As shown below, hygienists' roles are mostly limited to circumstances where patients are cooperative and they are emotionally uncomfortable outside of this environment.

**Focus Group 7 Student Hygienist:** *If it is in a professional environment, I am more than happy to do it. I usually say to my patients, right and I am going to nag you now, it's a professional talking to a patient. But when its friends and family I sometimes think, well it's not really my place because I'm a student and I am not a qualified professional yet.*

In contrast to hygienists, nurses' and student nurses' can have a greater sense of moral responsibility towards an uncooperative patient if patients are felt to require oral care and are unable to do it themselves.

Non-dental HCWs' roles are also emotionally different from hygienists roles in that oral care is one of many nursing care activities, while for hygienists, oral care is a major role. For non-dental HCWs, the need for oral care can conflict with the need for other care, creating further social and moral conflicts while hygienists do not experience this.

For HCWs, failing to provide socially and morally appropriate care is considered neglectful. Neglect can be emotionally distressing, as shown below.

**Qualified Nurse Focus Group 8:** *"It's the vulnerability of that person and it's neglect if you don't do it, it's total neglect".*

### 2.5.10. Emotions of the threatened person

Emotions of the threatened person in the theoretical model from the focus groups (Figure 2.3) include fear and anxiety relating to fight and flight response to threats. Feelings of anxiety and concern are experienced towards threatening or harmful oral conditions or situations for example, seeing a patient suffering with a painful mouth. These emotional concerns motivate HCWs to act because of concerns about the harm from not providing care, as described.

**Focus group 1 student nurse 1:** *It's the whole system of the body you know, without oral hygiene you know...*

**Focus group 1 student nurse 2:** *[Overlapping with student nurse 2] It's not very nice isn't it, if your mouth isn't in good health and you can't eat and you know that's one of the...*

**Focus group 1 student nurse 1:** *[Overlapping with student nurse 2] It's one of the things, see it has a knock on effect on everything.*

Although the lack of care is a threat to a patient, HCWs can be anxious about providing care as this may also cause harm to a patient for example, making the gums bleed or knocking a tooth out while carrying out oral care. Harm to patients can also include socially unacceptable acts for example, threatening a patient's autonomy as shown.

**Focus Group 3 Student Nurse:** *"We'd be committing assault if we cleaned somebody's teeth if they did not want to"*

Even when a patient is unconscious non-dental HCWs can still harbour concerns about interfering with a patient's wishes or normal self-care practices. In some cases, this involves anxieties about how a patient will react when they regain consciousness, which is a threat to the nurses caring for them.

Although HCWs' concerns are often directed at the patients' welfare, HCWs also have concerns for themselves. They can feel threatened by the consequences to themselves from causing harm as illustrated below.



**Focus Group 3 Student Nurse:** *“Yeah, but what I am saying is that if you do damage, whether you have got witnesses there or not, I dunno, I am very sceptical.”*

Concerns about being bitten and injured can evoke fear of oral care. These fears can relate to physical injury but the patient’s mouth is also seen as a potential source of infection and HCWs’ can experience anxiety about being infected with blood borne viruses, as illustrated below.

**Focus group 3 Student Nurse 1:** *“Coz I brushed one person..... she bit me right on my hand. As my hand was still inside you know, like between the teeth and she moved her jaw and I wasn’t quick enough and she bit me”. “And I was like more sceptical then about doing it, I mean cleaning the teeth of another patient. You know, I mean I like followed the procedures and the thing is”*

**Group 3 Student Nurse 2:** *“Got to be careful there ....”*

Anxieties about performing oral care can arise alongside feelings of uncertainty, a lack of control, support or confidence in their abilities and training. Health care workers describe using these anxieties and concerns to help them make decisions about providing care particularly when there is uncertainty as described below.

**Focus group 8 qualified nurse:** *I'm not very well trained in dental examinations of a patient; I am only going on a gut instinct when I look in their mouth.*

### **2.5.11. Emotions of visceral experience**

Emotions of visceral experience include physical feelings of disgust and emotional unpleasantness in the mouth and gut. Body products and external signs of infection elicit these emotions, for example putrid smells and food as illustrated below.

**Qualified nurse 2 focus group 6:** *“I am actually finding cleaning dentures, cleaning them. I find it really bad you know.”*

**Qualified nurse 2 focus group 6:** *“It’s the initial taking out that really, I dunno, does turn my stomach [feel sick], you know with all the bits of food left in there.”*

Participants all accepted that oral care could be unpleasant. The intensity of visceral emotions can vary. For example; while one nurse struggled to look in the mirror at her own mouth and could not carry out any oral care tasks for patients other HCWs reported having become accustomed to oral care experiences. Another nurse felt happy to brush teeth but was disgusted by the idea of flossing a patient’s teeth. Health care workers are still aware that a situation is unpleasant even when they report no emotional feelings, as illustrated.

**Student hygienist Focus group 4:** *Loads of patients say how can you do your job? but it doesn’t come across and [I] mean you get quite disgusting mouths and that sort of thing.*

HCWs reported using strategies to manage their feelings towards oral care. For example, maintaining a physical distance from the patient and wearing protective barriers such as gloves and masks, as shown.

**Focus group 6 qualified nurse:** *Okay, we, lots of our patients need oral care. I hate the sponges, I hate them, they are the most disgusting [things] and I’d put gloves on and get the swab and I go around that person’s the mouth and clean it and I may be gagging but I will put my finger in somebody’s mouth so long as they have not got teeth just to clean around.*

#### **2.5.12. Emotional valuation**

Emotional valuations are the emotions of weighing up the costs and benefits of taking action in response to a presenting situation. Costs include unpleasantness and perceived benefits of oral care include the prevention of pain and health problems arising from not eating as shown below.

**Focus group 5 Qualified Nurse:** *“It is an unpleasant job sometimes, but it needs to be done for the patients’ comfort so you just do it.”*

Benefits can also include the elimination of the negative social consequences of bad breath as illustrated below.

**Qualified nurse focus group 5:** *“bad breath makes them feel alienated”*

Taking action to benefit a patient is associated with rewarding emotions of pride and satisfaction. Empathetic emotions can be used to value care and are focussed on what they would want for themselves or a relative.

Oral care is valued in terms of how important and urgent it is and how much it needs to be done. Health care workers’ perceptions of this value can vary. For nurses, oral care is a smaller part of their working day and can hold a lower emotional value and sense of importance when compared to the management of dramatic and life threatening conditions. Health care workers experience little or no emotion towards the omission of an unimportant care activity of poor value as described below.

**Focus group 1 Student nurse:** *“Yes, check the dehydration is more nurses’ work”. . . . . . “But it’s (referring to oral care) not a routine like being a dental nurse routine, going into that mode. But as a nurse you tend to see the external parts of somebody’s mouth, the appearance of the face, if someone has a stroke or you know. You check for things like that rather than the internal oral hygiene”.*

Oral care can feel more valuable when the task is more technically difficult. There are some techniques for oral care, which are considered to be outside the scope of nursing practice. For example, flossing is not a normal oral care activity for patient care and is not well valued. Flossing is considered to be time consuming and time is an important personal resource. Negative emotions are associated with poor time management.

### 2.5.13. Personal resources

Mental and physical resources are used to undertake oral care. These personal resources are often quantified in terms of time, energy, emotional effort and support from others for oral care.

The capacity to deliver care is a finite resource, if a patient can provide oral care for himself or herself, then personal resources such as time can be spent elsewhere. Decisions are influenced by need for oral care; more resources are allocated to tasks where there is greater patient benefit. Indicators are used to decide upon the amount of time and effort required. For example, the ability to walk to the bathroom is an indicator for the time needed to support a patient with oral care, as shown.

**Qualified nurse Focus Group 5:** *“If the patient can clean their own teeth, I suppose then you assume. And I suppose if they can wash and dress themselves then I would assume that they could do it themselves.”*

HCWs use emotional effort and personal resources to overcome emotional disgust and anxiety towards oral care. Greater effort can be employed when the outcome of oral care is necessary and valued. This is illustrated by the response of one of the qualified nurses when discussing how she managed feelings of unpleasantness to provide a patient with oral care.

**Focus group 2 Student nurse:** *“You do ‘do it’ (referring to oral care) but it’s like, you do get self satisfaction out of doing it, but it is how my gut feels when I am doing it. It’s (my stomach is) turning like.”*

Emotional costs of providing oral care are also balanced against the reward and satisfaction of carrying out a good job, as shown.

**Focus group 6 qualified Nurse:** *“Yeah, I know that they are all gunged up, But I think about it really has to be done. I do have to think right let’s get on with this, rather than it doesn’t bother me at all, which is strange really because we’re dealing with a lot of other terrible body things. But then again we can hand them back nice and clean and that’s the main thing, so they have got clean teeth.”*

The emotional value and cost of providing care can change as shown below.

**Focus group 2 student nurse:** *“I worked in the community for seven years and I had to go out to [to look after] ..peoples’ teeth there and when they asked me to brush them and I would say no. I would say, I’ll pass you the stuff but you have to clean them yourself coz I could never touch teeth before. See I would say that it’s only the past six months that I have started to actually touching teeth and not having a phobia about it but I couldn’t touch but, Oh no I wouldn’t coz it would make me sick. And I would like be heaving.”*

## **2.6. Results from the second stage of data collection**

### **2.6.1. Introduction**

This, the second part of the qualitative results, describes terminology for oral care, and then the model of nurses’ individual emotions towards oral care. For the purposes of this stage of the study, the term “nurses” is used for qualified and student nurses and distinctions between these populations are made where necessary.

### **2.6.2. Terminology of oral care**

Nurses in the second stage of study confirmed that they recognised, understood and responded to the term oral care. Their interpretation of what oral care involved varied.

Individually, when describing oral care nurses use terminology for function, descriptive and the people. All participants mentioned a range of different procedures. Terminology varied for different individuals and while procedures such as tooth brushing were described by all of the nurses, only nurses from ITU and some of the student nurses described the use of Vaseline for lips as an oral care procedure Table 2.4.

**Table 2.4 Frequency of selected descriptive terms used for oral care during the interviews**

Descriptive terms	Interviews using terms (n)	Nursing roles using description
Brush, brushing, scrub, scrubbing, toothbrushing	10/10	ITU Nurses, Stroke Care Nurses, Student Nurses
Rinse, swill, mouthwash, chlorhexidine	9/10	ITU Nurses, Stroke Care Nurses, Student Nurses
Swab, sponge, wipe, sponges, swabs, flannel	8/10	ITU Nurses, Stroke Care Nurses, Student Nurses
Vaseline	6/10	ITU, Student Nurses

Data retrieved from word searches of data categorised as oral care terms in Nvivo 8

On an individual level, oral care is described in the context of the care environment with a sense of time space and place for care as illustrated below:

**Qualified Nurse 1 Intensive Care Unit Interview:** I've had a patient today and I've just done it [oral care], actually the family only was in this morning, it does depend on the time of day when you can do it.

As with the focus groups, participants described people in relation to oral care (Table 2.5). Although hygienists can provide oral care assistance on the wards in hospitals they were not mentioned by any of the interview participants. There were also differences between participant groups, for example, the student nurses did not mention relatives, while ITU and stroke care nurses did. At times nurses used terms for organisations rather than the people to denote people within an organisation, for example, when referring a patient to dental hospital staff, nurses described referring to the dental hospital.

**Table 2.5 Persons described in the interviews when discussing oral care by nurse's role**

Person	Interviews including terms (n)	Nurse role		
		ITU	Stroke Care	Student
Nurse	10	2	3	5
Patient	10	2	3	5
Relatives	3	1	2	0
Doctors	3	2	1	0
Dentists	4	1	1	2
Hygienist	0	0	0	0

### **2.6.3. Definition of oral care**

The definition of oral care developed from focus group data (2.5.4) was considered after analysis of terminology used for oral care. This definition was considered applicable to the interview findings.

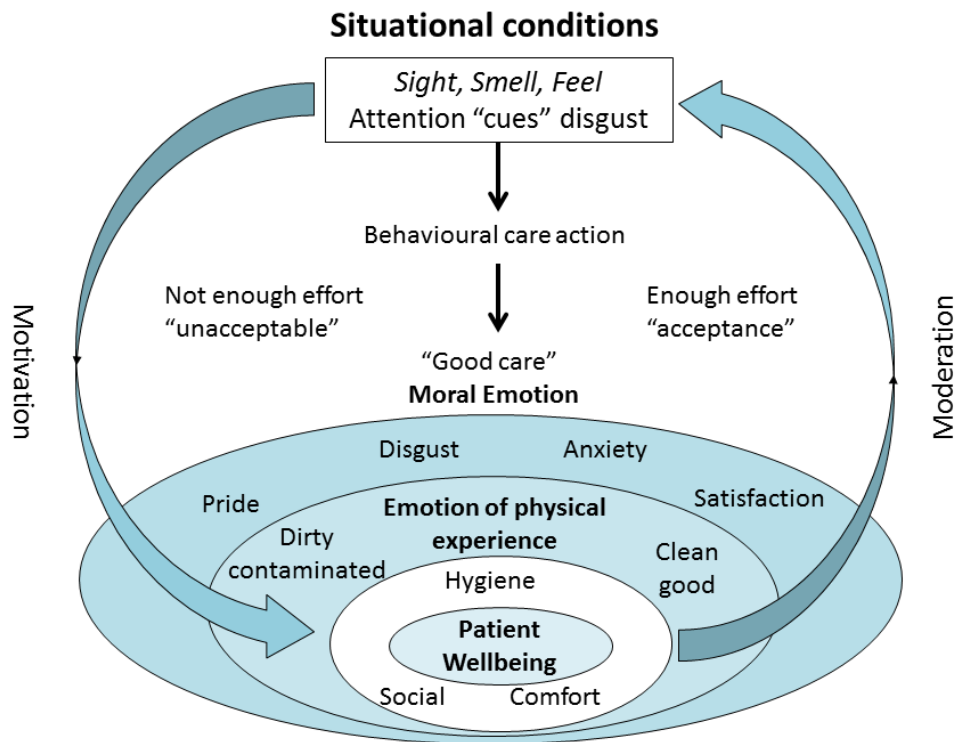
### **2.6.4. Model developed from the focus groups**

The model developed from the focus groups was tested with data from the interviews. No adjustments to the model were required. This confirmed that individual experiences were represented within the group model and no further work was undertaken to repeat work in the first study from this point. A further model was developed from data for nurses' individual experiences and emotions of oral care. This model outlined the events following initiation of oral care (Figure 2.4).

### **2.6.5. The model of individual experience**

The model of nurses' individual experiences of oral care was developed from the point of initiation of oral care and is illustrated below.

**Figure 2.4 Second theoretical model- Individual nurses' emotional experiences towards oral care developed from the one-to-one semi structured interviews**



**Core category of patient well-being**

Nurses' emotions and caring behaviours are directed towards the improvement of patient well-being. Patient well-being is the core category of the model and for nurses, this involves the state of hygiene, social well-being and the comfort of the patient. These dimensions are interrelated and represent a holistic state of wellness and health. Enhancing patient well-being is a positive emotional experience for nurses whereas a poor state of patient well-being can be distressing and unpleasant.

**Well-being as a hygienic state**

A hygienic state of well-being involves the elimination and removal of bacteria, debris and other contaminants in and around the mouth. These pose a threat to the state of health and holistic integrity of the patient. This is



an ideal state of cleanliness that provides both wellness and physical protection from harm; this cleanliness is a positive emotional experience.

A state of hygienic cleanliness also includes the conceptual removal of contamination from within the body. After the interview one participant, described the cleaned mouth using the adage “Cleanliness is next to godliness”. This sense of central cleanliness is considered to help the patient holistically.

### **Social well-being**

The social well-being of a patient is an interpersonal state. External signs of poor hygiene, such as bad breath are noticed socially and being unclean is considered unpleasant for the patient, because it is socially embarrassing. The smell of being unclean is considered unfair on other patients in the ward. Nurses feel these emitted signs of poor hygiene cause offense and discomfort to others. Oral care procedures are considered to improve this social state for the patient and others around them as illustrated below.

***Student Nurse 3 From Focus Group Interview:*** “if you have got someone who is unclean then you are obviously a bit more conscious about it because they are usually on a bay with five other people because it's not what am I trying to say? That person may want to live their life like that but when you are in an enclosed environment and they share it with either the people, I don't think it's fair on the five other people to have one that is not very clean, so they're going to get bathed”.

Nurses feel that oral hygiene enhances the social wellbeing of the patient by allowing them to interact socially with others, thereby returning a patient to their social self, as illustrated below:

***Qualified Nurse 1 Stroke Care Interview:*** “It is actually quite satisfying to see a mouth nice and clean and it's quite rewarding, almost to see a patient looking a bit happier and getting their smile back.”

## Comfort well-being

Patient well-being involves physical and psychological comfort. Nurses pay attention to patients' comfort levels and their emotions reflect these concerns as shown below.

**Qualified Nurse 1 Intensive Care Unit Interview:** *"I tend to look at them as a whole ..... but the first thing I do is see at the patient and see if they are in distress or if they are uncomfortable."*

Nurses feel that oral care actions can aid patient comfort. Providing comfort is important for patients, nurses and family members and is emotionally rewarding as shown below.

**Qualified Nurse 1 Stroke Care Interview:** *"We put Vaseline on the lips as well..., every couple of hours, it's one of the biggest wish questions from families .....Particularly here because especially in the winter with central heating you will find layers have crust sort of building up on people's lips with the dryness and things so it's nice to put on a bit of moisturiser or even a bit of lipstick and get patients to encourage them to rub their lips together which is quite good for them mouth recovery as well and blowing kisses and things like that is ..good for them."*

## Initiation

Findings indicated that oral care may be initiated in favourable conditions to protect the patient from threats to their wellbeing. Nurses have different approaches to initiation. For some nurses, oral care is a routine process for each and every patient. For some it is delivered to a selection of patients who they feel need it, while for others it is an additional extra part of care that is outside of normal routines. Care can be initiated in circumstances of little or no reported emotion but in these circumstances, the routine and ritual of care remain important as described below.

**Student Nurse 3 From Focus Groups Interview:** *“Oral care was part of the bed bathing ritual we have just picked it up as part of that and we have just made sure that we have done it along with the bathing.....oral care is part of that check and you are checking whether they are dry or are they comfortable and you will be checking on that as well so, it seems to fit into the routine ,as long as you have got it in a routine you will be fine you won't forget it.”*

Sensory detection of the smell, feel and sight of a patient's dirty mouth are described in terms of emotional disgust and fear. The most severely dirty cases cues can be noticed from afar in the ward. Nurses use descriptions that include the 'Mankey mouth' for these experiences. Stimuli for this can include food, debris and plaque related tissue damage. Nurses pay attention to these features and this can trigger action.

**Qualified Nurse 2 Intensive Care Unit Interview:** *“sometimes we turn the patient and I guess we do things without thinking so we will automatically be like 'he needs doing' and someone will say 'it's the smell' and you will be like, 'it's their breath', you know it's a neuro patient and its neuro breath, yes so it's that kind of triggers it really.”*

Nurses experience the greatest range of sensory cues for oral care in close proximity to the patient. The breath smell of the dirty mouth is a commonly described as “stale”, “strong and “morning breath”.

Nurses can associate the sight and smell of a patient's mouth with the feel of their own mouth, empathetically imagining themselves in the position of the patient. Knowing when a patient needs oral care is associated with unpleasant feelings in relation to sensory stimuli that are a cue for them to take action as illustrated below.

Nurses use past experiences to help them to interpret what they see or feel. As illustrated below, a number of nurses stated that they provided oral care because, when left without brushing, their own mouth felt unpleasant.

**Student Nurse 2 Interview:** *“I would ask because, it’s horrible and it makes you really conscious of your breath smelling and when you’re with nurses and stuff and the patient and the nurse have quite a close relationship and you know you can smell breath on each other.”*

The intensity of nurses’ emotions in relation to the mouth and the threshold of unpleasantness can vary between individuals. Nurses can use disgust to help them determine how frequent oral care should be. Experienced nurses describe becoming accustomed to unpleasant appearances, lessening their emotional reactions but not necessarily the cue to act as described below.

**Qualified Nurse 2 Intensive Care Unit Interview:** *“When I first started working on here and because I came here newly qualified and I haven’t got much experience elsewhere but when I first worked and I work down here it was kind of oh my gosh all the smells, yes, taken aback by all of that but I think you do get used to it and so and I think now you don’t think it’s awful you just associate them with what you have to do because you know what you have got to do, I know that sounds silly because it comes a bit more easily now.”*

### **Behavioural care action**

Nurses aim to provide good care which means improving a patient's state of well-being. Emotions of behavioural care include disgust, anxiety, pride and satisfaction; these emotions are felt in relation to the physical and moral experiences of care.

### **Emotions of physical experience**

Physically, a dirty mouth is considered to be unpleasant, as are the physical distorted appearances of plaque related oral conditions. Seeing and experiencing a dirty mouth is uncomfortable for the nurses. Nurses also feel moral emotions towards physical appearances.

### **Moral disgust as the motivation to care**

Nurses must each make sufficient effort to provide care and improve patient well-being. For nurses, insufficient effort towards patient care can be

emotionally uncomfortable, unacceptable, neglectful and morally wrong because it decreases patient well-being.

**Qualified Nurse 1 Stroke Care Interview:** *“Always like frustrated that someone has not been cleaning the mouth and you do get a bit annoyed at that.”*

Most nurses feel morally disgusted by deliberate neglect. These unpleasant emotions are uncomfortable and motivate nurses to act to ensure that they do not neglect their patients.

**Student Nurse 2 Interview:** *“What do you mean? If they've got a dirty mouth? Well if they've got dried saliva on it, also sometimes after food, you can see that the patient has, you know, [food and debris] all over their nightie, all over their face it's all stuck in their dentures and you just think, I need to sort these out I really need to sort these dentures out or clean them or something and clean their face, and then nose and their mouth.”*

Although neglect feels morally unpleasant and unacceptable, nurses appreciate that poor oral health may not be deliberate and may be a reflection of the care situation. Rather than criticising another nurse or accusing a colleague of neglect, they prefer to highlight the difficulties in achieving oral health as shown below.

**Qualified Nurse 1 Stroke Care Unit Interview:** *To me it looks like it's as though they haven't been given the care. It looks like poor practice if it's not being done routinely. I can appreciate that for some people that it builds up quite quickly, and in cases like that it is quite difficult to say to relatives look it's building up we keep on top of it as much as we can but not, perhaps we haven't as much as we would like to.*

### **Disgust and the moderation of care**

In some situations, procedures may cause harm to a patient. Nurses are then faced with the dilemma of how to improve patient wellbeing in a way that does not cause harm. Occasionally, nurses avoid providing oral care altogether, but in most circumstances nurses tailor the care that they are

providing. Nurses select oral care procedures and modify the delivery of care to try to minimise the discomfort for themselves and the patient.

**Student Nurse 2 From Focus Group Interview:** *“..quite often I get to swill their mouth at first to get rid of any food debris or anything because you don't want to be a abrading the gums and stuff with stuff already [there] and you ask them what they want on their toothbrush. ... sometimes they don't want a great big wadge of toothpaste on the toothbrush and sometimes they may want a little bit and then generally I would em I brush I get them to open their mouths I come brush the back teeth sort of as well as you can it's never as good as when you would be doing it on yourself and I find a lot of the time because the patients don't like you doing their back teeth because it makes you gag.*”

Oral care is not always successful, but if a nurse feels that they have made enough effort to care for the mouth, then a poorer oral health state and negative emotions may be reluctantly accepted as shown.

**Qualified Nurse 3 Stroke Care Interview:** *“Because on some of the patients it doesn't matter how often you do it, the mouth is still, you feel as if you haven't a done your job you feel quite disheartened really”*

### **Emotions of anxiety**

Patients' oral conditions can evoke physical and moral anxieties, which are uncomfortable for nurses. As with disgust, these emotions motivate and moderate oral care behaviours to reduce harm.

**Student Nurse 2 From Focus Group Interview:** *“that sounds awful but I do not spend as much time cleaning someone's teeth as I do my own because I can't imagine it is necessarily very comfortable having it done. I've been to the dentist and the hygienist, it's not pleasant. Relating to my own experience having my teeth cleaned by someone else, it's not pleasant. I spend more time on my own (teeth) and obviously for me, I'm not worrying about my feelings if you know what I mean, because it's me, I'm in charge, whereas with the patient I think you are more aware that they are trusting*”

*you to do the best you can without hurting them, without me making them uncomfortable, without making them gag.”*

At times nurses are too anxious about providing care as described below.

**Qualified Nurse 1 Intensive Care Unity Interview:** *“I know that it would be ideal if we could brush the teeth twice per shift but we can't, there's never enough time to do it it's the time because if they are intubated and they've got the tube in their mouth, you need to use two nurses, so if it was something that a task that I could do on my own [so] that I could manage my time so that I could fit [oral care] in, but when you have got to rely on somebody else, then it's hard then.”*

### **Emotions of pride**

Nurses experience a sense of personal and social achievement through improving patient wellbeing on an individual level. When nurses act to undertake care, they can experience moral and physical pride in their actions and their care. Overcoming challenges to providing oral care is also emotionally rewarding.

**Qualified Nurse 3 Stroke Care Interview:** *“If it looks better I think yes I done that good, I've got something there, yes, so you do feel very proud of yourself when you are there, especially when relatives mention it and it does make you feel yes.”*

Not making the effort to provide care can damage nurses' self image, personal pride and integrity.

### **Emotions of satisfaction**

Similarly to the personal pride, nurses can be satisfied undertaking care. Although it may be unpleasant to clean a patient's mouth, experiences can still be emotionally satisfying as improving the patient's wellbeing can be rewarding.

A greater improvement can be more satisfying and more rewarding. Failing a patient can be a very dissatisfying experience, and nurses are motivated to undertake actions that move away from these negative feelings.

**Qualified Nurse 2 Intensive Care Unit Interview:** “I would say is the satisfaction that you've done something good for them.”

### **Summary of the findings**

The term ‘oral care’ is used for a range of procedures and experiences. Although some procedures are common to all HCWs, some procedures are more specific to groups of nurses working in particular areas of care.

Oral care is initiated and provided in legitimate situational conditions. These conditions can influence emotions and the delivery of care.

Oral care can be a routine or initiated process.

For nurses, oral care and the emotions surrounding the experience are centred on patient wellbeing.

Emotional disgust, anxiety, satisfaction and pride are associated with oral care and these emotions can relate to the moral and physical aspects of the experience.

Nurse roles influence emotions towards oral care.

Emotions are associated with the motivation to provide oral care to improve patient wellbeing.

Where oral care actions harm a patient’s wellbeing and provoke anxiety and disgust, behaviour may be modified and alternative oral care procedures may be selected.



## **2.7. Discussion**

### **2.7.1. Introduction to the discussion**

A critical discussion of the strengths and limitations of the methodological approaches used in this study will be presented. Findings will then be discussed and considered in the context of previous studies of nursing care, HCW interactions with the oral cavity and studies of human emotion. Models developed from the study will be considered in relation to existing behavioural theories, the theory of reasoned action and cognitive dissonance. Findings will then be considered in relation to the study objectives. Finally, methodological evidence for further investigation will be discussed.

The focus group and interview studies described a range of emotional constructs and experiences of daily oral care in hospitalised adults and these were explored with nurses and HCWs. This meant that the overall aims of the study were achieved but there were both strengths and limitations to the approaches used and therefore the findings.

## **2.8. Critique of the methods**

### **Qualitative method**

The initial study used qualitative methods, which meant that differences in how oral care terms were interpreted were examined. These differences were previously unseen in the literature because most studies had used generic terms for oral care (Adams, 1996, Wardh et al., 1997, Ohrn et al., 2000, Furr et al., 2004, Mynors-Wallis and Davis, 2004, Wardh and Sorensen, 2005). Basing the quantitative study on this literature may have introduced internal validity issues because participants can interpret questions and terms differently. The initial qualitative methodological approach was therefore justified and appropriate.

## **Grounded Theory**

Grounded Theory was suitable for the study aims because it was adaptable for both interview and focus group data and provided an established framework to develop understandings. Although common methodological issues for Grounded Theory studies were addressed at the outset, the practicality of collecting data in this population influenced how the methods were applied. Times for the focus groups and interviews were dependent on the availability of participants. Although data collection and analysis were concurrent, it was not possible to complete all analyses in advance of collecting further data. This occurred each time participants were derived from the same population, for example student nurses in the same year, due to the availability of participants. It is therefore possible that some opportunities to collect additional data for example, using more prompts to expand upon areas of interest may have been missed. As data collection continued until the point of theoretical saturation, later opportunities remained available and there was no evidence of missing data when data collection was complete.

Glaser and Strauss (1967) suggested that prior knowledge could bias analysis and it is possible that understandings developed in the first study influenced the second. This was tested in the study as a researcher with no prior knowledge, verified transcript coding independently. As grounded theory is an evolving process and is not a coding framework, parallel coding was not possible, however, the second researcher agreed data coding in the study, in order to reduce the potential for bias.

## **Population under study**

Focus groups included nurses, student nurses and student hygienists, which showed a range of different emotions and experiences across these groups. The second stage of data collection was undertaken with student and qualified nurses and it was possible to explore individual experiences in further depth. The study findings showed that student nurses and nurses' experiences and roles in the delivery of oral care to patients in hospitals can be different to those of hygienists. Findings also suggested that emotions

arising from oral care reflected those differences in roles. In the literature, there is some evidence to suggest that those who choose nursing are more disgusted by body elimination products than the general population (Corgiat et al., 1986). Differences in personalities of those who have chosen nursing compared to hygienists and student nurses' and nurses' perceptions of their care roles may therefore influence emotions and care. Present study findings also suggest that health care assistants may also have different roles in oral care; although these experiences may be important for patient oral care, these were not examined in this study. As a result, focussing on nurses in the second stage of data collection was appropriate for examining the relationship between emotion and care but it is possible that as a result of this focus, study findings are less generalisable to other groups of HCWs.

A wide age range of student and qualified nurse participants were included in the study, ensuring that a range of viewpoints were included. The sample was predominantly female but male viewpoints were included, and one focus group was predominantly male. Although the strength of emotions arising from male participants may have been different to females, the study was only designed to explore the range of experiences and not differences. Themes emerging from male participants fitted within the theoretical model and it was considered necessary to explore these differences experiences in more details in a later study.

The sample was however limited to those interested in participating, which may have biased the results towards those with favourable responses towards oral care, however, negative responses towards care were seen. In addition the sample included predominantly white participants and no social class data were recorded potentially limiting generalisability. Beyond this, it should be considered that the study was conducted in a single country in a localised geographic area. Differences in experiences between different cultural and ethnic groups, social classes and variations arising from differences across geographic regions may have been missed.

## Data

Emotional experiences were identified in the focus group data and interviews. Both relationships between participants (Hollander, 2004) and the dynamics of a group, specifically the homogeneity or heterogeneity of a group can influence data generated (Krueger and Casey, 2000).

From a theoretical perspective, the thoughts, feelings and actions of a group may be different to those of the individual (Le Bon, 1903, Freud, 1949). It is possible that group interactions in the focus groups (Krueger and Casey, 2000) may have influenced the range of data collected and magnified emotions irrelevant to the delivery of care.

Furthermore, study data from both focus groups and interviews were not actual day-to-day ward interactions therefore it is possible that some experiences were omitted. The findings however showed similarities to attitudinal studies of oral care, which found reports of unpleasant experiences (Eadie and Schou, 1992, Chalmers et al., 1996, Wolfe et al., Wardh et al., 1997, Furr et al., 2004, Reed et al., 2006, Andersson et al., 2007b), therefore many of the emotions identified were as expected. The present study did however identify emotional themes that had not previously been seen in oral care studies, for example moral emotion, but these emotions had been identified in the wider emotion (Russell and Giner-Sorolla, 2013) and care literature (Gutierrez, 2005) and were plausible. These findings indicated that the methods were appropriate for the aims of the study.

Focus group and interview techniques allowed collection of further details, explanations and context; this was shown in the natural language generated in the study. Data included experiences, places and people, which were useful to assist understanding. Although these expanded the detail, when discussed all together these could not be separately linked to emotions. The techniques were therefore useful for exploring emotional experiences in context but not for quantifying them.

### **Social Acceptability Bias**

Data collection in both the first and second stages of the study involved social interactions. In the study, neglect and harm appeared to be socially unacceptable within the groups and a lack of oral care was often described in terms of neglect however, although participants reported that such viewpoints existed at no time did any participant express this perspective. One explanation for the lack of this viewpoint could be selection bias, and it is possible that the groups consisted of participants who were most interested in oral care. A further explanation could be social acceptability bias as deliberately not providing care was deemed socially unacceptable within nursing. It is possible that these perspectives were held but not shared in the study. Although these viewpoints were not expressed, these views were identified, enabling further investigation and consideration for later studies.

### **Moderator and interviewer role**

In the focus groups, the moderator role in each group actively directed participants, to the topic of oral care to meet the objectives of the study, which limited the amount of non-relevant information and ensured engagement with quieter members of the group prompting for further details or explanations. However, the focus group moderator and interviewer was a qualified dentist and it is possible that this professional role influenced responses given in the groups.

### **Recording of data**

Study data were collected as audio data, which were converted to text for analysis. The researcher became very familiar with the data content as a result of this process. Although Glasser and Strauss (1967) advocated minimum data recording, the advantage of using audio recording and transcription was the transparency of the process, which added to validity.

(Kvale, 1996 pp163) has however pointed out that transcripts are “artificial constructions from oral to written communication” and contextualised details are lost from the translation of interviews in to text. In the present study,

additional details of experiences may also have been lost, for example interactions between participants were not recorded in any depth and so were unavailable for analysis. It was possible to categorise the positivity or negativity and emotional direction of self-reported experiences, but analyses were based on transcripts and without the added dimensions of vocal tone and facial expression, it is possible data may have been miscategorised, for example if a sarcastic comment was given.

Video recording interactions between participants may have provided additional data and would have also allowed the inclusion of facial action coding for emotions (Matsumoto et al., 1991). Video analysis is considered complex and the rigour of these analyses in this circumstance could not be verified. In addition, the presence of a video recorder within the context of a group may have affected data shared, although there is limited evidence in this area of research to support this argument. The methods used in the study were supported within the literature and were considered appropriate.

### **Analysis**

Analysis used Grounded Theory techniques and individual responses within focus groups were not explicitly compared. Individual and grouped responses are debated in the literature (Carey and Smith, 1994, Morgan, 1995, Morgan, 1996, Duggleby, 2005) but there is no consensus. In the present study, a transparent view of data was sought (Kidd and Parshall, 2000) and so data were analysed in relation to the purpose of the study which was to look at the range of emotions relating to oral care.

Skills developed during the focus group analysis assisted and facilitated interview analysis. The researcher spent less time learning to categorise data, speeding up the process however, less time was spent immersed with the interview data. It is possible that as a result of the previous analysis and the reduced amount of time with data, that points may have been missed.

### **Technology and analysis**

Data analyses were undertaken with qualitative computer software. This approach has been criticised within the literature for affecting the relationship

between the researcher and the data (Fielding and Lee, 1996, Kidd and Parshall, 2000, Atherton and Elsmore, 2007). In this study, computers were used alongside printed transcripts for the analyses. Furthermore paper based transcript analyses were less time consuming than computer based analyses. Extended time increased researcher familiarity with data. Additionally, it was possible to see and consider all of the category headings on the computer screen during the analysis, this assisted the constant comparative technique by providing an overall view of data.

### **Validity**

A major criticism of analysis of Grounded Theory studies (Sim, 1998) is validity of data and analyses. In this study, lines of data were coded in relation to the emotional content of the contextualised conversation and not the words because individual words can have different emotional meanings and valence (Luo et al., 2004) and emotional word expression can be complex with context of spoken conversation (Cowie and Cornelius, 2003, Douglas-Cowie et al., 2003). It is possible that the analysis included some misinterpretation of emotional conversations, for example, it is possible that sarcastic comments without auditory tone information could have been coded incorrectly.

In this study, the same researcher provided moderation, transcription and analysis this meant that the original context of the conversation had been observed in advance. In order to reduce observer bias, initial analyses were verbally fed back to participants to provide clarification and confirmation of analysed data. Further to this, the researcher kept notes their reflections of these experiences in order to be explicit about any perceptions that may have biased the findings. Coding was verified but it is acknowledged that double coding all transcripts at the outset would have been a more robust approach to verification, however this approach is better suited to framework analysis as described in Krueger (2000). Further feedback to participants when analyses were complete would have also provided additional rigour however, because of the way that data were anonymised, this was

impractical to carry out. Validity of study data and findings were addressed by the second stage of the study (Section 2.4).

Interview transcripts were sent to participants, which allowed participants to verify their transcript data. No changes were made, however one participant offered further detail in support of their comments. It remains possible that the researcher and participant had different interpretations of the data as described by Kvale (1996).

### **Bias**

It is possible that individuals who disliked or did not value oral care did not volunteer to participate. Recruitment and data collection in the study was not targeted to find participants who disliked, refused or struggled to carry out oral care. In view of this, it is possible that study findings were constrained by selection bias.

Conduct of the interviewer and times of day were kept consistent because mood and emotional states can influence emotional responding. Although these states could not be controlled in the interviews, it is unlikely that they biased the results because, in line with the methodology, data were collected, tested and compared until theoretical saturation was reached.

### **2.8.1. Discussion of findings**

The findings of focus group and interview studies will be discussed. Firstly, descriptions and terms for oral care will be considered. Models developed in the first and second stages of the study will then be reviewed in the context of the literature.

#### **Terminology and procedures of oral care**

Oral care terminology and descriptions in nursing have received little consideration in the literature. The present study findings described functional actions, descriptive terms, and people in relation to oral care experiences (2.5.4, 2.6.2). Past oral care research (Wardh et al., 1997, Wardh et al., 2000, Wardh et al., 2002b, Paulsson et al., 2008) has been



based upon the assumption that the term 'oral care' is consistently interpreted across professionals and patients alike. The present study findings show that HCWs do not necessarily share a common view of what oral care involves and conflict with this assumption. As a consequence, previous studies using these generic oral care terms may have internal validity issues as nurses and HCWs may have interpreted oral care questions differently.

Terms used for the mouth and oral care in the focus groups were the same as the interviews. Both stages of the study indicate that oral care is not one act but is instead, a range of procedures. Oral care procedures in the present study were similar to the range seen across the oral care literature (Bowsher et al., 1990, Pearson and Chalmers, 2004, Jerreat et al., 2007, Malkin, 2009).

ITU nurses in the study applied Vaseline to the lips as part of their oral care whereas student nurses on general wards did not mention lip care. The results indicated that the roles of HCSs and nurses on the wards and ward organisational environments could influence perceptions of what oral care involves. However, it is also possible that practices reflect differences in care protocols (Kenny, 1990, Cheng et al., 2002, Binkley et al., 2004, Cason et al., 2007, Hsu et al., 2011), however many of these procedures had no evidence base (Cohn et al., 2006, Yeung and Chui, 2010).

The present study found a range of different emotional reactions towards the various oral care procedures. Previous studies which specified procedures (Wolfe et al., 1996, Frenkel et al., 2002, Binkley et al., 2004, Furr et al., 2004) showed care quality differed for each procedure. For example in one study, denture cleaning was carried out more effectively than intraoral brushing (Frenkel et al., 2002). Emotions were not measured in the study but different reactions were seen which might reflect differences in reaction to different oral care procedures rather than individual reactions to the same stimuli.

### **Language of oral care and emotion**

Language is embedded in oral care experiences because HCWs have to communicate with each other and patients to deliver care and the use of language in the present study suggested strategies to reduce the emotions, using language to make oral care more acceptable and depersonalised. For example, the term “strong breath” was used instead of “bad breath”. This appears to provide a less judgemental and less emotive way of describing oral care. It may also be part of a number of strategies to cope with the unpleasant aspects of oral care. Language use agreed with the presence of emotions towards oral care and a further study of descriptive language and terms using content analysis may reveal more about the how language is used to deliver and deal with oral care.

### **Emotional descriptions of the process of oral care**

At the outset of the study it had been postulated, that oral care was emotional because emotional descriptions had been identified in previous studies of oral care.

At times, some participants reported no emotions, even in circumstances generally acknowledged as unpleasant. This lack of self-reported emotional experience could be the result of individual differences in emotional awareness (Van Rooy and Viswesvaran, 2004), differences in responsiveness or differences in willingness or ability to share emotional experiences. It is also possible that a lack of an emotional response was because of coping skills (Folkman and Lazarus, 1988) rather than a lack of emotional responsiveness.

Emotional findings were similar to other qualitative studies of emotion work in nursing (McQueen, 2004, Huynh et al., 2008, Gray, 2009). Although emotional experiences were identified, not all participants demonstrated emotional responses in relation to all oral care experiences. It is possible that some oral care experiences do not evoke emotions and it is also possible that individuals may experience events differently. The concept of individual differences in emotional experience is established in the literature

(MacLeod and Hagan, 1992, Von Hippel et al., 2005). It is likely that people respond differently towards oral care but these differences were not addressed in the focus group study because the methods were not sufficiently sensitive to these.

### **2.8.2. Initial model from the focus group study**

The model from the focus group study outlined emotions in the context of the care environment. Although this was based upon group data and is not designed to explain individual experiences, it demonstrated a breadth of experience not seen in previous studies.

#### **Situational conditions**

In the interview study, situational conditions were central to oral care and the idea of external influences on care are consistent with the wider oral care literature. For example, the organisational environment time, place (Chalmers et al., 1996) and previous experiences of HCWs (Blank et al., 1996) have been associated with oral care provision however, none have demonstrated an empirical link.

Previous studies (Wardh et al., 1997), have described feelings towards oral care static states, however in the present study the overarching concept of situational conditions has been presented as a dynamic changing environment for oral care. These changing situations and emotions have not received previous consideration in the literature and the present study indicated that a range of changing emotions might influence care. The idea that emotions can be evoked in relation to various environmental and interpersonal stimuli (Mauss and Robinson, 2009) is supported in the wider literature. Changing reactions have been shown in studies using facial movement (Matsumoto et al., 1991), skin conductance, heart rate, self-report and MRI imaging (Mauss and Robinson, 2009). Although the model indicates a relationship, the precise nature of this is not explained, as the evidence is not appropriate for this. It is also possible that variations in

emotion will occur in relation changes in the cognitive interpretation a situation rather than changes to the situation itself.

### **Meaning and geography of the situation**

In the interview study, oral care involved interactions within the context of a social and geographic environment. Context is important for emotions, because it affects how emotions are perceived and experienced (Feldman-Barrett et al., 2011) and it can also be important for how emotions are managed. The concept that situations are meaningful is also consistent with the work of social scientists (Twigg, 1995) and the meaning of situations is embedded in psychological models and theories of emotion regulation (Gross, 1998, Gross and John, 2003).

In the focus group study model, the meaning and geography were influenced by HCW experience, norms and values. Concepts of norms and values are well established within behavioural theories, for example, the theory of reasoned action (Ajzen, 1991). In the interview study, the absence of adequate oral care may be below the expected norm. This was associated with disgust and taking action. However, the theory of reasoned action does not explain the immediate emotional reactions or dynamic events seen in the present study.

Individuals involved in oral interactions normally have memories, experiences and individual personal values, which are meaningful (Weber and Johnson, 2009). Health care workers have different views on what is an acceptable level of self-care and oral hygiene for themselves (Zadik et al., 2008), and these views differ from those of patients (Paulsson et al., 2008). As HCWs' traits and views of their own health care can affect their own oral health (Dumitrescu, 2007, Dumitrescu et al., 2008, Dumitrescu et al., 2009a, Dumitrescu et al., 2009b) and behaviours, it is entirely plausible that HCWs' experiences add meaning to situations and influence patient care.

### **Initiation**

Oral care commences with initiation. Previous studies have looked at oral care as a single event, for example, whether oral care is provided (Talbot et

al., 2005), oral care procedures carried out (Soh et al., 2011) and clinical oral hygiene outcomes (Frenkel et al., 2002). Oral care has rarely been considered as a process involving a series of related events and previous studies have not considered the prompts to carry out oral care in isolation from the event of oral care.

The interview study indicated that routines supported care. This was in agreement with Menzies-Lyth (1960) who stated that care routines help nurses to deal with unpleasant and difficult emotional experiences, enabling them to provide care. In the present study, routine initiation was unemotional, which may support this theory. Findings showed that routines were important for HCWs and failing to follow a routine for oral care could evoke negative moral emotions. This is similar to nurses experiences in a study by Kelly (1998) who found that nurses found a failure to live up to moral expectations distressing. It is therefore possible that these care routines, are an important method of coping with being a carer. It is also possible that those who provide oral care routinely, may suffer less emotional strain providing care than those who do not, which may explain the range of emotional responses to care.

When oral care is not routine, it can still be initiated by emotional prompts such as a patient discomfort. The drive to act in these circumstances can be explained by Cognitive Dissonance Theory (Festinger, 1962), which suggests that the emotional discomfort arising from the conflicts is a motivational force for behavioural action. Discomfort from seeing a patient in distress may therefore motivate a nurse to act. Although this theory is plausible, the present study lacks individual level emotion-behaviour data and so, although reasonable and relevant, the mechanisms of motivation and initiation could not be examined in detail in this study. This was addressed further in relation to the second stage of study.

In the present study, HCWs felt emotional discomfort when their outlook on care was different to the organisational environment around them. These concepts have featured previously in the literature. Menzies-Lyth (1960) stated that organisational support enables nurses to provide care whilst lack

of such support could be a barrier to care and this agrees with studies of barriers to oral care (Wardh et al., 2000) and evidence that shows ward supervision has a positive effect on nursing care (Berggren and Severinsson, 2000). The findings from this study therefore agree with the suggestion that support from other people and the organisation promotes care while a lack of support does not.

### **Internal and external evaluation**

In the model, internal and external evaluations of care reflected the different methods of processing information. This concept is credible as psychology studies have demonstrated different modes of emotion processing (MacLeod and Hagan, 1992, MacLeod et al., 2002) and cognition (Dolan, 2002). Emotion regulation theories also suggest that emotional regulation involves the situation, attention, appraisal, and then a response (Gross and Thompson, 2007). It is possible that differential processing of information could be part of mechanisms to make decisions and take action but the present evidence can only be used to suggest this for oral care information. The present findings do corroborate evidence from other studies, which suggested that care might be influenced by the environment (Wardh et al., 2000, Wardh et al., 2002a, Binkley et al., 2004).

### **Emotions of social moderation**

The present study found that oral care interactions and emotions were shaped by social factors. Previous studies have shown that social customs (Davies, 1963) and experiences (Thorogood, 2000) affect interactions with the mouth, however the social rules for being an oral care provider are less well explored. Similar to previous studies of touch (Ingham, 1989, Routasalo, 1999, Exley, 2009), the present study described the mouth as an intimate area of the body, which was not socially touched outside the clinical setting. Oral care was also described as an intimate event, which reflected existing narratives of personal nursing care (Williams, 2001, Kirk, 2007) and concepts of the body in relation to intimacy (Rozin et al., 1995).

In the present study, social emotions varied in relation to professional and roles; hygienists' emotions were different to those of nurses. The idea of a relationship between social rules for care is well supported theoretical literature (Farber NJ et al., 1997). The study also showed that HCWs have legitimate roles in providing oral care, which agrees with the existing theoretical literature. Exley (2009), for example pointed out that only specific individuals are permitted to provide care of the mouth and eluded to differences between dental and non dental health care workers. The present study findings appear to show a more complex relationship than suggested as permissions relate to individual procedures of care. It is possible that these differences are important for the care that a patient receives.

In the present study nurses' felt uncomfortable with resistant and uncooperative patients but while a lack of patient cooperation did not diminish nurses' care roles they could change the emotional experience. For example, in the study, forcing care upon an uncooperative patient could violate a patient's dignity and evoke social and moral emotions. These events met moral violation criteria outlined by Greene (2011) and were similar to studies of cultural (Rosenblatt et al., 1989) and socio-moral violations (Sussman, 1978), supporting the concept of moral emotions towards oral care.

The resistance to care and associated sense of discomfort towards providing oral care in the present study has been identified previously in the literature (Jobman et al., 2012). It is clear from the literature that patients are not always passive or cooperative for oral care (Chalmers et al., 1996, Jablonski et al., 2011b). Resistive behaviour is considered to be a barrier to care (Forsell et al., 2010) to the extent that scales for measuring and strategies for managing resistant behaviour are being developed in care homes (Jablonski et al., 2011a, Jablonski et al., 2011b).

The present study indicated that HCWs face conflict between the pro-social moral emotions to provide care, external demands and the desires of the patient. These differences agree with nursing (Ketefian, 1985, Corley, 2002, Gutierrez, 2005, Halpern, 2007) and dental literature (MacEntee et al., 1999,

Reis et al., 2011). Furthermore previous studies indicate that these events can be difficult (Hartrick Doane, 2002) and distressing (Corley, 2002, Zuzelo, 2007) for those delivering oral care. These conflicts are rarely discussed in the training literature and it is possible that they are not considered within oral care training, which may partly account for the lack of efficacy of training.

### **Emotions of threatened persons**

Harmful and unpleasant oral stimuli in the present study were associated with emotional anxiety. Although emotional reactions to the mouth and oral conditions have not received much research attention, findings in the present study are similar to reactions to physical threats in the literature. Studies have shown that harmful stimuli and contagious threats attract attention (Vogt et al., 2010) and stimulate emotions.

Chalmers et al. (1996), in a study of care home residents, found that one of the reasons given for not providing oral care was a fear of being bitten. Similar fears were identified in the present study and there is considerable support for a link between dental experiences and fear (De Jongh et al., 1995).

Threats of physical and emotional harm to the patient were identified within the study, for example, carrying out unwanted care could be considered as physical assault, an act harmful to the patient (Farber NJ et al., 1997). In addition, HCWs were also concerned about harming themselves, for example, being bitten, getting in to trouble for doing something wrong. Harmful experiences affected both self and other; this blurring of boundaries fits with theoretical perspectives in the literature (Holmes et al., 2006).

### **Emotions of visceral experiences**

Present study findings found that oral debris; hygiene, food, physical intraoral touch, interpersonal contact and moral offenses were described in terms relating to disgust. These unpleasant experiences related to Haidt et al. (1994) seven domains of disgust and in the study included food, body products, hygiene and interpersonal violations. Physical and moral disgust to these stimuli in the study corroborates concepts in the wider disgust literature



(Eisenberg, 2000, Chapman et al., 2009, Eskine et al., 2011, Graham et al., 2011).

For example, a common finding was food in the mouth that evoked disgust. This was detected by a combination of visual experiences, smells, touch and interpersonal experiences. The texture and experience of food is associated with disgust (Haidt et al., 1994, Astrom et al., 2006, Han et al., 2012) however food related disgust has not been explored in previous studies of the mouth and oral care. Furthermore, studies have given little attention to the unpleasant aspects of the mouth but unpleasant feelings have been reported towards mucous, and crusts in and around the mouth (Wardh et al., 2003).

In addition to visual stimuli, study participants also described smells in relation to an unclean and unpleasant mouth. Emotions can be influenced by smell (Schnall et al., 2008a) but in the study it was not possible to examine the relationship between olfactory sensory stimuli, emotions and oral care as these were not explicitly rated or comparable. These findings suggest that role of olfactory stimuli in oral care may require further investigation.

HCWs reported stimuli in relation to the need to use of masks and gloves. Emotional disgust is associated with avoidant behaviours (Curtis et al., 2011) and there is evidence to show that nurses employ strategies to cope with care (Picco et al., 2010). These behaviours suggest coping strategies to deal with the emotions of providing care, further corroborating the presence and role of unpleasant emotions in care.

Unpleasant feelings in the study related to both moral and physical stimuli. Moral disgust has not been found in the previous oral care literature, but does fit with nursing narratives of care (Ketefian, 1981, Berggren and Severinsson, 2000, Esterhuizen and Kooyman, 2001, Corley, 2002, Georges and Grypdonck, 2002, Tarlier, 2004, Laabs, 2005, Badger and O'Connor, 2006, Storch and Kenny, 2007). Disgust is considered to be a moral emotion, which brings together conceptual experiences and physical stimuli (Lindeman, 2011). Moral disgust and unpleasantness towards oral care

stimuli in the study is corroborated by the literature, but again the study did not quantify these experiences or emotions.

### **Emotional value and personal resources**

Concepts of value and personal resource are established within the oral care literature. Concepts of priority and value have been examined on a fundamental level within the psychological literature, for example using gambling task studies in the laboratory (Stocco and Fum, 2008) and emotional rewards from goal achievement (Weber and Johnson, 2009) but there is less empirical evidence for emotional rewards from providing oral care. Wardh et al. (2003) found in a Grounded Theory based study that nurses gave oral care lower priority compared to other nursing care procedures. These findings agree with Wolfe (1991, 1996), who used a questionnaire based study to examine the priority of oral care. Although the literature suggests that care staff give oral care different levels of priority most studies have used generic terminology for oral care and it is difficult to exclude internal validity issues arising from different interpretations of care.

In the present study participants described how they prioritised care in relation to patient needs. These findings agree with Batson who (1995b, 1995a, 2007) showed that seeing urgent and immediate needs of another person could motivate students helping behaviour. In his studies, he showed that the immediacy of a need could increase the effort given to helping behaviours and the effort given was value related, which agreed with the present study. Batson showed that this effort reduced over time, although time was not explored in the present study; this indicates that it may be relevant to emotions and oral care.

It is conceivable that the emotions relating to value and the effort of providing oral care in the present study may also help protect nurses' from overstretching themselves at work. This is because the balance of effort and reward has been shown to affect burnout and stress in nursing (Brotheridge and Grandey, 2002). It is therefore possible that these emotions have a relationship with the health of nurses but this was not examined in the present study and may warrant further investigation.

### **2.8.3. Interview study model**

The interview study model explained individual emotional experiences of oral care. This focussed on nurses' individual experiences of oral care beyond the point of initiation. The interview study model was not verified beyond the nursing population and may not be externally valid to other care workers. Furthermore to explore the emotional experience of oral care in depth, this study did not examine the experiences leading up to initiation and further study in this area was indicated.

### **2.8.4. Core category wellbeing**

The interview study showed patients' wellbeing at the centre of nurses' emotions towards oral care. This concept of a holistic sense of wellbeing agrees with both nursing literature and narratives of nursing care (Gutierrez, 2005, Berry and Davidson, 2006). Curtis and Wiseman (2008) for example, in a summary of essential care stated that, "Essential nursing care is provided for the health, comfort and dignity of the patient." Wellbeing is fundamental (Locker and Matear, 2001) and is central to the World Health Organization definition of oral health. Wellbeing has also featured at the centre of motivational theories in psychology (Leary, 2007, Galand et al., 2012). Wellbeing is therefore a concept shared between the nursing, dentistry and psychology and is a plausible central category for the interview study model of emotions.

### **Hygiene and wellbeing**

Dirt and contamination are threats to the body and evoke negative emotions (Dorfan and Woody, 2011) of disgust (Curtis and Biran, 2001, Curtis, 2007, Lee and Schwarz, 2010b) and fear (Rachman, 2004, Charash and McKay, 2009, Willems, 2011). The present study showed that an unclean mouth evoked emotions, in addition, removing contaminants and improving hygiene was associated with positive emotions. As physical contamination and morally unpleasant experiences can subconsciously increase the frequency of hygiene behaviours (Zhong and Liljenquist, 2006, Schnall et al., 2008a), it

is possible that these positive emotions from a reduction in implicit and explicit disgust. The study therefore suggests that these emotions agree with the literature and may be both implicit and explicit.

### **Social wellbeing**

Social wellbeing was associated with emotions for example, bad breath was socially unpleasant on the ward. This agrees with Miller (1997) who suggested that bad breath was a moral failing on the part of the individual in the social world. The idea that oral care improves social wellbeing also agrees with by Zhong and Liljenquist (2006), who proposed that cleansing removes the external signs of immoral acts. Furthermore, most recently Schnall (2011) proposed that the removal of contaminants served to increase social cohesion, again reinforcing the social function of cleansing and supporting the concept of social wellbeing in relation to oral health in the present study.

### **Comfort**

In the present study, it was found that nurses experienced negative emotions when patients are uncomfortable and positive emotions when comfort was achieved. Comfort is a fundamental component of good nursing care (Wurzbach, 1996, Wurzbach, 1999, Berry and Davidson, 2006) and wellbeing. Oral health care is considered to enhance patient comfort (O'Reilly, 2003, Berry and Davidson, 2006, Thelin et al., 2008). The importance of comfort in nursing care is supported by Nordenram et al. (1994) who identified that nurses felt that freedom from oral pain and fear, and being able to eat were fundamentally important for patients. Concepts of comfort and social experiences have also featured in more recent accounts of oral care (Yoon and Steele, 2012), corroborating the study findings.

#### **2.8.5. Initiation**

As discussed, rituals and routines are important for nurses and in the present study these were focussed on the central category of patient wellbeing.

Nurses in the study indicated moral emotions towards oral care, agreeing with concepts in the earlier stage of study. Moral cues have been considered in relation to general nursing behaviour (Crisham, 1981, Ketefian, 1981, Ketefian, 1985), moral judgement (Kim et al., 2007) and distress in nurses (Corley, 2002). Morality is also linked to emotion (Blasi, 1999), the motivation to act (Nasrin et al., 2012) and is a plausible cue for oral care. It is however equally possible that these emotions are not the cue but instead reflect feelings related to cues for care. As nurses in the study however felt that care of the mouth was part of their role and so this evidence suggests that initiation of oral care is underpinned by moral experience and is associated with emotions.

In the study, nurses' attention was drawn to the physical, visual appearances of oral conditions. These cues were described as a reason to commence care and many were described as unpleasant. Duncan and Schaller (2009) showed, that conditions with physical signs of disease attract attention and so the attention to oral care stimuli and motivation to act in the present study fits with the existing literature.

Although the present study showed evidence of a relationship between moral and physical cues for care and initiated action, the nature of this link was not fully explored as these were not quantified and compared. For example, while it is possible that the different nurses reported different emotions towards the same stimuli, it is equally plausible that differences reflected reactions to different stimuli. Furthermore, nurses in the present study described becoming accustomed to smells associated with care. It is therefore possible that the relationship between cues and initiation may be affected by exposure, time and training.

### **Oral care behaviour**

On an individual level, emotions in the present study were associated with oral care behaviours. The mechanisms for this are not clear and it is possible that emotions reflect rather than guide the experience. The study found that oral care behaviours are directed towards "good care" and the literature suggests that behaviours and emotions may be underpinned by

individual norms, values and attitudes, in line with the theory of planned behaviour (Ajzen, 1991), however the study was not designed to test theory.

At times, in the study, nurses described little emotion towards oral care behaviours. The concept of intended goals may help to explain the lack of emotion towards some oral care actions. Gollwitzer (1999) suggested a process of automatic goal striving behaviours whereby actions towards a goal become automatic. Again, these theories may only be suggested as an explanation for the results and were not tested in the study.

### **Moral disgust and motivation**

In both studies, nurses were morally disgusted by poor and neglected oral health states. As previously considered, disgust is a moral emotion (Schnall et al., 2008b, Schnall et al., 2008a, Chapman et al., 2009, Horberg et al., 2009, Knoll, 2009, von dem Hagen et al., 2009, Eskine et al., 2011, Lindeman, 2011, Schnall, 2011) which motivates action (Blasi, 1999, Curtis, 2007, Oaten et al., 2009, Curtis, 2011). In view of the longstanding association between social morals and disgust (Chapman et al., 2009, Rozin et al., 2009) the concept of moral emotions towards the mouth and oral care in the study is plausible.

Nurses in the present study found poor oral health states emotionally uncomfortable and study findings suggested that these states conflict with patient wellbeing. Providing oral care appeared to alleviate nurses' discomfort producing positive moral emotions. This agreed with a reduction in dissonance between the distress in seeing a patient in a poor state and the emotional challenge of carrying out care in line with Cognitive Dissonance Theory (Festinger, 1962). The existence of moral emotions, moral reasoning and moral behaviour is supported in the literature (Kohlberg, 1969). Ajzen and Fishbein (1980) and Ajzen (1991) included the concept of moral norms in their papers relating to the Theory of Planned behaviour. The moral motivation to care in the study is therefore theoretically and empirically supported.

Although these moral states were identified in the first and second studies, the studies did not provide any measures of emotional intensity, motivational drive or motivated behaviour and so the nature of the relationship is not explained by the study.

### **Disgust and care moderation**

Nurses in the study felt that oral care could be physically and morally harmful for patients. Health care workers have reported omitting oral care because of concerns about harm in previous studies (Chalmers et al., 1996, Reed et al., 2006). The conflict between the need for care and the potential for harm may therefore present a difficult dilemma. The present study suggests that nurses adapt their care to minimise the risks to themselves and their patients but there is little evidence in the literature of this negotiation.

Difficult decisions and moral emotions exist in the nursing literature. For example, Badger and O'Connor (2006), found that nurses experience moral dilemmas and use strategies to cope with delivering care in ICU. There is also evidence of distressing moral and ethical dilemmas (Corley, 2002, Gutierrez, 2005, Laabs, 2005, Zuzelo, 2007, Laabs, 2011) and moral choices in nursing (Wurzbach, 1995, Wurzbach, 1996, Wurzbach, 1999). It has also been argued that nurses are constantly confronted with difficult moral choices (Corley, 2002) and may violate social or ethical boundaries associated with moral disgust (Greene, 2011). Present study findings agree with the suggestion in these studies that moral and ethical dilemmas are a common and accepted part of nursing. Nurses felt uncomfortable criticising someone else's care without justification, agreeing with adjustments of behaviour in relation to discomfort. From these common understandings of the conflicts between the need to provide care and the difficulty in doing so, it is plausible that care procedures are modified.

### **Anxiety**

Fear and anxiety are commonly related to dental procedures (Corah, 1988, Collado et al., 2008, Armfield et al., 2009, Humphris et al., 2009). In the present study, anxiety related to both physical and moral stimuli, and the

distinction between these has not been found in the oral care literature. The literature has identified disgust and anxiety in relation to contamination (Cisler and Olatunji, 2010), blood (Van Overveld et al., 2011, Olatunji et al., 2012, Broderick et al., 2013), spiders (Thorpe and Salkovskis, 1998, De Jong et al., 2002, Sawchuk et al., 2002, Van Overveld et al., 2006, Huijding and de Jong, 2007, Olatunji and Deacon, 2008, Olatunji et al., 2009a, Teachman and Saporito, 2009, Olatunji et al., 2010a, Bianchi and Carter, 2012) and injury (Sawchuk et al., 1999, Olatunji et al., 2012, Broderick et al., 2013). The relationship between disgust, anxiety and avoidant behaviour is also well established (Olatunji and Broman-Fulks, 2009) and so the motivational and moderating aspects of anxiety identified in the present study are plausible. The present study gives further depth of understanding of these experiences.

### **Pride and satisfaction**

Nurses in the second stage of the study described pride and emotional satisfaction from providing oral care for their patients, agreeing with the first stage of study. The study showed that these emotions were experienced for achieving the outcome of oral care. Pride is a moral emotion (Tangney et al., 2007) which is considered to have a motivational function (Tangney et al., 2007, Williams and DeSteno, 2008). These emotional rewards for oral care in the study are similar to positive rewards from goal achievement (Baldwin and Baccus, 2004) however in the study, not all situations evoked emotional pride and satisfaction. It is possible that emotional rewards from providing oral care are affected by experience, effort and surrounding social conditions. It is also possible that these rewards motivate care but further evidence is required to demonstrate this.

### **2.8.6. Conclusion**

The aim of the study was to explore HCWs' emotions towards oral care for their adult patients. The present study collated a wide range of emotional experiences towards oral care that were both positive and negative. The



study also included emotions relating to how oral care is enabled and rewarded.

A range of experiences and different interpretations of the term “oral care” were identified in the present study. Oral care terminology has not received attention in the mouth care literature and a greater appreciation of the relevance of terminology has been gained. As a result of the present study it is now considered that previous studies of oral care may be subject to internal validity issues because of the use of generic terms for oral care and inconsistencies in how terminology is interpreted.

Situational conditions are central to emotional experiences of oral care. As a result, it is possible that generic studies that have not specified the situational conditions of oral care for questions may be subject to internal validity issues because HCWs consider a range of situations when answering questions in relation to oral care.

Oral care is a process and not a single event and so there are a number of points of the process where oral care could be motivated or hindered. Oral care is initiated and emotions underpin the process of initiation in both routine and initiated care. The process of initiation was not detailed in the findings and further investigation would enhance the understanding of initiation of oral care.

Oral care is an interpersonal experience that involves cognitive thinking processes and automatic reactions. Emotional experiences are both physical and socio-moral; these emotions motivate and hinder oral care activities. Even when initiated, the oral care provided for patients may be less than ideal because of these emotions. These emotions are therefore important for the care provided for patient.

Oral care evokes physical and moral emotions, which include disgust and anxiety these motivate and inhibit oral care procedures but the extent to which these emotions influence care is not fully understood. Oral care can also be emotionally satisfying and rewarding.

### **Considerations for the next study**

It is clear that although emotional experiences have been identified and better understood, these experiences are difficult to compare objectively and quantitatively in this study. Studies in wider HCW populations, different cultures were indicated to broaden build upon the understandings for different care workers. A further study of experiences leading to initiation leading to oral care was also indicated to build upon this work.

In terms of the aims and objectives of the thesis, the greatest weakness was that individual reactions to the same situation could not be compared in the present studies. It was therefore not possible to examine the relationship between emotions and specific behaviours. As a result, further studies using a consistent oral care stimulus, objective measures of emotional experience and measures of oral care procedures were indicated as the next stage of study.

# Chapter 3

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## **3. Pilot studies to explore student nurses' explicit and implicit emotions towards oral care for hospitalised adults**

### **3.1. Introduction**

This chapter describes studies to pilot methods for the capture and measurement of student nurses' explicit and implicit emotions towards oral care. These studies follow the previous chapter in this thesis, which identified a range of emotional reactions towards oral care. It describes how findings and models from the second chapter of this thesis were used as basis for pilot studies to capture and quantify student nurses' explicit and implicit reactions towards oral care.

This chapter commences with an overview of the studies to develop and test the components of a questionnaire tool to measure emotions. It outlines methods for the studies and the order of delivery for the tests. Descriptions of tests for explicit emotions are followed by those for implicit responses. Tests are described chronologically in terms of their development and not delivery, commencing with the card sort study methods and results, as this was the first test to be developed. It then describes methods and results for the remaining tests for explicit emotions commencing with the pilot questionnaire study to test and explore oral care stimuli, questions and scales for measuring explicit emotions towards oral care. This is followed by the methods, and results for the interview study. It then outlines methods and results for Stroop tests and heart rate tests to measure implicit reactions to oral care stimuli. Details of individual studies are presented as subchapters. This chapter concludes with a discussion of the methods, findings of the pilot and recommendations for the design of the further studies.

### 3.2. Methods for the pilot studies

Pilot studies involved methods for explicit and implicit emotional data collection. An overview of these methods used in the pilot studies is shown in Table 3.1.

**Table 3.1 An outline of emotional data and measures used for the collection of data in the pilot studies**

<i>Emotional Data</i>	<i>Measures</i>
Explicit	Questionnaire for emotions towards scenarios and behavioural intention Interview Card Sort of Images
Implicit	Stroop test Heart rate variability

#### 3.2.1. Methods for the pilot studies

The study population were nursing students from Cardiff University School of Nursing.

The research project was ethically approved by School of Psychology research ethics committee and was peer-reviewed by the research ethics committee in the School of Nursing (Appendix 3.1).

Participants were recruited through advertisements and notifications in Cardiff University School of Nursing. Electronic notifications were pasted onto the virtual learning environment blackboard, paper flyers were placed on notice boards and announcements were made in lectures. Participant information sheets (Appendix 3.2) were also made available online, at the School of Nursing information desk and in lectures following announcements.

Inclusion criteria were student nurses who had seen or provided mouth care for an adult. Individuals who could not spend 20 minutes looking at a computer screen or could not use a computer keyboard and mouse were excluded.

### **Study procedure**

Volunteers were provided with a copy of the participant information sheet and the consent form and were asked to read these in advance of the study. A time and date was then agreed with each participant for the study.

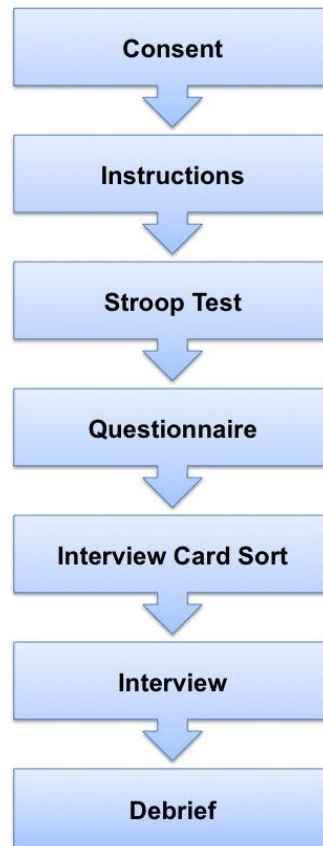
Study procedures were explained at the beginning of the set of trials. Participants were invited to ask any further questions and were informed that they were free to withdraw at any time. Consent forms were signed before commencing the study.

Interviews and tests were carried out in quiet conditions in office and teaching room locations in the School of Dentistry to minimise the effect of noise or lighting conditions. Tests were carried out in the order outlined in Figure 3.1. A debrief (Appendix 3.3) was provided at the end of the tests and participants were given the opportunity to express any concerns or issues relating to the study.

### **Reward for participation**

Participants were provided with a £15 gift voucher as a thank you for participating in the study.

**Figure 3.1 Diagram showing the order of tests in the pilot study**



### **3.3. Materials and methods for the pilot card sort**

A card sort study was undertaken for the purpose of understanding how participants felt about the content of images developed for the studies in this chapter. These methods first outline the production of the images used in the studies and then outline the card sorting study.

#### **Development and production of images**

A range of images of the mouth with no signs of oral disease and images with oral hygiene related clinical conditions were produced for the studies (Appendix 3.4). This involved identifying images for inclusion, the production of images, digital editing and image preparation.

Data from the first study were examined in order to identify oral conditions seen in nursing. Diagnostic terms and clinical descriptions were used to produce a list of conditions that included plaque debris all over the teeth, bleeding gums, inflammation and swelling of the gingivae, dentures and dryness of the tissues.

Disease free clinical pictures with consent for image use in the research were produced for the study. A standard orthodontic image set of intra-oral anterior, lateral, palatal and lingual views were taken by a professional dental photographer using cheek retractors and dental mirrors. Images were of one oral cavity with a clean, minimally restored adult dentition and no obvious intraoral pathology. Pictures of a denture were also produced. Digital imaging software (Corel Paint Shop Pro X, Ontario Canada; Microsoft Office Picture Manager, Redmond, United States of America) was used to age the appearance of the teeth, darkening the colour to a VITA shade A4 and reducing the height of inter-dental gingivae between the teeth. It was also used to add restorations to images.

Images of oral hygiene related conditions were produced by applying a range of common food items to the mouth and teeth of the stable disease free adult mouth as outlined in (Appendix 3.5). Additionally images were produced using the digital imaging software. Reference images from a digital library

were used and oral conditions were superimposed onto the clean mouth images. All images were digitally aged.

### **3.3.1. Methods for the card sort study**

A simple card sort used, this was informed by previous studies using sorting methods (Baker et al., 2006, Martins and Pliner, 2006). Participants were given cards with all of the images produced for the study (Appendix 3.4) and a large table. They were asked to sort the images into groups that they felt should be together. Participants were informed that there were no restrictions on the number of groups and that they would be asked to describe each of the groups of cards.

Participants were left to sort cards and then informed the researcher when they had finished sorting the cards into groups. The researcher then asked participants to explain the reason why the cards belonged in each group. The researcher manually wrote down the descriptions used for each of the groups and the number of the image on the cards in each group.

#### **Card sort data preparation and verification**

Data from the interview card sort were retrieved and manually entered in to Microsoft Excel 2007 (Microsoft, Redmond, United States of America). The same researcher verified data entries on a separate occasion to ensure that data had been transferred accurately.

#### **Thematic analysis**

Descriptions and rankings for each card sort group were analysed systematically. Thematic analysis was informed by emotion theories for the classification of emotions and emotion wordlists (Plutchik, 2000, Strauss and Allen, 2007, Princeton University, 2010), illustrated in Appendix 3.6 and the Oxford English Dictionary (Stevenson, 2010). Emotional themes were then developed from card sort data. The number of themes was based on the most frequently occurring number of groups. Themes were neutral, mid and highly unpleasant and these were rated numerically using 1, 2, and 3



respectively and participant responses to each picture were then recorded using this framework (Table 3.2). A qualitative rating was produced for each image using the median qualitative score across all participants.

**Table 3.2 Outline of the framework for card sort analysis in the pilot study**

	Category (shaded with excel cell colour)		
Score	1	2	3
Qualitative	Normal	Next in severity	Gruesome
Description	Not too bad	Not completely healthy	Horrific -no idea of what is going on
	Healthy	Not grotty but needs a good brush	Gross
	Clean, happy to care for myself	Concerned, consider referring	Would scare me
	Healthy not perfect	Not completely healthy	Manky mouth, unkempt
	Ok, same	Dentures yuck, fillings	Definitely worried, unpleasant, serious consequences.
	Ok not amazing	Fake	Deficiency or illness

### 3.3.2. Results of the card sort study

#### Baseline characteristics of participants

Eleven participants completed all tests in the pilot study (Table 3.3). Participants were predominantly white British (n=10) and female (n=10). Students from all three years of nursing study participated in the pilot; the majority of participants were first year students (n=7). Table 3.3 Baseline characteristics of participants in the pilot study.

Variable		Count
Age	Range 18 years -32 years	11
Gender	Males	1
	Females	10
Ethnicity	White British	1
	Not-white British	10
Year of study	Year 1	7
	Year 3	1
	Year 3	3

All participants sorted cards into groups, most (nine of the eleven) opted for three groups of cards, the remaining participants chose five groups. Participants rated images by unpleasantness and anxiety (Appendix 3.7) and categorised images two, ten, three, five and thirteen as being the least unpleasant. Images twelve, one, seven, eight and fourteen mainly consisted of plaque related tissue damage and were described as being very unpleasant, horrible, scary and gruesome. While some participants rated images of dentures, previous oral disease and restorations in the mouth as normal, some considered these to be unpleasant.

### **3.3.3. Discussion of the card sort study results**

Image content development and selection used established questionnaire content development processes (Oppenheim, 1992) and applied these to the selection of images. Previous studies of emotion had provided little information to explain how images were selected (Olatunji et al., 2009a, Broderick et al., 2013) and could not be followed. The approach taken in the present study appeared justified as participants' interview responses confirmed that these scenarios were plausible within the nursing environment. This evidence suggests that although the images in the present study were not validated using emotion-rating scales, these image stimuli were legitimate for the purpose of exploring reactions to oral care images. Furthermore, the use of the same images in each of the present studies enabled comparisons between explicit and implicit stimuli.

In the study, the card sort generated qualitative reports and emotional ratings for each image using simple groupings. A more complex card sorting activity, for example ranking each card against the next as seen in multidimensional scaling studies for disgust in relation to foods (Martins and Pliner, 2006) would have generated more data but would have taken more time and would have involved specifying the emotions under investigation. The selected technique in the present study did not restrict responses and by the participants selecting unpleasantness as the basis for the card sort, participants revealed perceptions of the images. This technique allowed participants to freely categorise how they perceived the images. Participants all chose to categorise the images using terminology for unpleasantness and disgust, and these findings therefore indicate that oral care images are associated with disgust. This agrees with findings in the focus group and interview studies in this thesis, which suggested that disgust was relevant to oral care.

Although descriptions were similar, it is not possible to determine whether one participant experienced similar emotions to another, however, the card sort findings agreed with results from the initial study in the thesis, interviews

and questionnaire findings and so similarities in participants' experiences appear plausible.

It is possible that card sort findings may have been influenced by questionnaire content as it was carried out before the card sorting activity, but the questionnaire examined three emotional experiences, disgust, anxiety and satisfaction. Card sort study findings, however indicate that emotional disgust is particularly relevant to oral care. Furthermore emotional reports were similar to those seen towards disgust evoking images in psychology studies (Olatunji et al., 2009a) and behavioural tasks in studies of disgust and fear (Koch et al., 2002). Emotional reactions to the image content seen in the card sort are therefore plausible and these images appear to be appropriate for examining emotional reactions towards oral care.

### **3.4. Materials and methods for the pilot questionnaire study**

The pilot questionnaire study was for the purpose of developing and testing scenarios, images, questions and response scales to measure student nurses' emotions towards oral care. This was designed with four component parts. The first two parts comprised a clinical scenario and clinical images to provide consistent oral care stimuli as a basis for the questions. The second two were questions and response scales for emotions. A wide pool of scenarios and questionnaire items were produced for the pilot in accordance with established questionnaire development practice (Netemeyer et al., 2003).

#### **Development of a descriptive clinical scenario for the pilot questionnaire**

Commonly used patient and oral care descriptions from the focus group and interview studies were used as the basis for the descriptive clinical scenario. A description of a conscious patient who was dependent on the nurse for oral hygiene care was developed. The written presentation of the scenario was modelled on Cardiff University School of Nursing curriculum scenarios for oral care.

The patient scenario was discussed in depth with a member of the Community Health Council in Wales who had considerable experience of supporting the public with complaints about poor or absent oral care whilst in care. This discussion was to confirm that from a community perspective, the scenario was commonly encountered and was a situation where patients would expect nurses to provide oral care.

#### **Development of images for the pilot questionnaire**

Images used in the card sort were sized to 600mm wide and 450mm and imported for survey tracker software to prepare them for use in the questionnaire. The size and content of pictures in the survey was confirmed using a test version of the survey on the computer screen.

### **3.4.1. Questions for the pilot questionnaire**

Questions for emotions and oral care behaviours were developed for the tool. These were based on the theoretical models for oral care developed in the second chapter of this thesis from the focus group and interview studies.

#### **Questions for participant characteristics and previous experiences of oral care**

Previous attitudinal studies of oral care (Wardh et al., 1997, Binkley et al., 2004) and studies of oral care in hospitals (Grap et al., 2003, Binkley et al., 2004) were used to inform the selection and development of patient characteristics and oral care experience questions. Three common oral care procedures derived from the initial focus group study were specified for the previous experience questions.

#### **Questions for emotions and behaviours towards oral care**

Questions for emotional feelings care scenarios were informed by studies measuring affect and valence towards images (Feldman-Barrett, 2004, Libkuman et al., 2007). Theoretical models from the focus group and interview studies were used as a framework for the creation of questions as illustrated in Table 3.4. Emotional questions relating to empathetic emotions, (feelings in the patient's position) towards oral care were also included, as "self" and "other" were not clearly delineated in the focus group or interview studies.

**Table 3.4 Outline of the framework for the qualitative themes, questions and emotion scales used in the pilot questionnaire**

Theme Focus and studies	from group and interview	Question questionnaire	in Emotions scales used with		
			Disgust	Anxiety	Satisfaction
<b>Attention cues</b>		How would you feel seeing this?	✓	✓	
		If you were the patient how would you feel about this?	✓	✓	
<b>Moral emotions</b>		If you did not brush his teeth how would you feel?	✓	✓	✓
<b>Physical emotions</b>		How would you feel touching this?	✓	✓	
		How would you feel while brushing his teeth?	✓	✓	✓

Questions to assess behavioural intention were based on previous studies of oral care (Grap et al., 2003, Binkley et al., 2004). The specific wording for intended procedures was informed by literature (Oppenheim, 1992) and descriptions of oral care procedures described in the focus group and interview studies. A question about asking for help with oral care was also included as this behaviour was described by a number of participants in the focus group and interview studies.

Response scales were developed for demographic, previous oral care experience, emotion and oral care behaviours. Response scales for demographics and previous experience were based on scales used in previous studies (Grap et al., 2003, Binkley et al., 2004).

Likert question scales were selected as a single scale for recording data for several emotions in line with previous emotion studies (Feldman-Barrett, 2004, Libkuman et al., 2007). A five point scale (Watson et al., 1988) was chosen to fit images and the scale on the computer screen.

A single scale of oral care frequencies was selected, this was informed by studies of oral care in hospitals (Grap et al., 2003, Binkley et al., 2004) and the evidence that oral care is most effective when it is carried out twice per day.

Referring for help was quantified in terms identified in the focus group and interview studies, as never, possibly or definitely. Questions and measures for this are shown in Table 3.5 and an illustration of the questionnaire presentation is shown in Figure 3.2.


**Table 3.5 Illustration of the behavioural intention themes, questions and measures used in the pilot questionnaire**

Theme	Questions	Measure
Behavioural intention (motivation and moderation)	For this patient would you	Frequency
	Brush in the mouth of the toothbrush?	
	Use a toothbrush to clean this?	
	Use a swab on a stick to clean this?	
Behavioural intention (moderation)	Ask or refer for help?	Intention

**Figure 3.2 Illustration of the scenario, image, question and scale used in the pilot questionnaire study**

**Scenarios**

Imagine that the pictures below are from a patient who has had a recent stroke and has been on the ward for a few days. This patient at present has little or no function in their dominant arm and is unable to walk to the bathroom. The patient has some facial weakness making speech difficult to understand. The patient is under your care at work, imagine this patient as vividly as you can.



**9. How would you feel touching this mouth?**  
Please tick to indicate your answers ☑

Not anxious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extremely anxious
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not disgusted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extremely disgusted
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questions were repeated with horizontally flipped images, to retest validity in accordance with questionnaire development practices (Oppenheim, 1992, DeVon et al., 2007). The questionnaire is shown in Appendix 3.8.



The online tool was developed using survey tracker software (Training Technologies Incorporated). This software was compatible with photographic images and was supported by the information technology department for online data delivery and collection within the School of Psychology. Data retrieval pathways were created and tested using a practice copy of the survey and dummy data.

### **Administration of the questionnaire**

Tests were administered under the conditions previously described. A Samsung r780 laptop with a 15-inch computer screen and a mouse was used for questionnaire. Participants were seated and positioned with approximately 60cm from eyes to the screen.

### **Data preparation and cleaning and checking questionnaire data**

Questionnaire data were retrieved from Survey Tracker software using the pathway set up in. Data were retrieved as Microsoft Excel 2007 (Microsoft, Redmond, United States of America) data files and uploaded to SPSS version 18 software (IBM Inc, New York, United States of America) for data checking and analysis. The checklist from Tabachnick and Fidel (2007) was used as a guide for data checking prior to analysis. Data were screened for accuracy outliers, missing data and out of range values using visual inspection and data sorting in Microsoft Excel 2007 (Microsoft, Redmond, United States of America). These were further examined using SPSS data frequencies, mean, mode, range minimum values, maximum values and variance. SPSS Scatterplots were used to examine heteroscedasticity. SPSS descriptives were used for skewness and kurtosis and histograms were used to visually explore the distribution of data.

### **Analysis of questionnaire data**

Questionnaire data were analysed using SPSS version 18 software (IBM Inc, New York, United States of America), Microsoft Excel 2007 (Microsoft, Redmond, United States of America), Ggobi (Swayne et al., 2008), R (R Development Core Team, 2011) and Mondrian (Martin, 2011) software packages. Emotional response ratings were examined using frequencies,

median values and the value range. Data tables, bar plots, scatter plots and parallel plots were produced to examine visually questionnaire responses across participants and participant's individual responses to questions for each scenario. Contingency tables and X<sup>2</sup> tests were then used to test associations between responses to different questions for each scenario and to compare the responses to the same questions in the different scenarios. All statistical tests were planned with advice from statistician and psychologist with experience of these tests. Test procedures, results and interpretation of results were reviewed by and discussed with the statistician and psychologist.

### **3.4.2. Pilot questionnaire study results**

All 11 participants completed the pilot questionnaire.

#### **Previous experiences of oral care**

Previous experiences showed variations. While seven had brushed someone else's teeth before they started nursing and four had cleaned dentures before nursing (Appendix 3.9). The majority of participants reported occasional or frequent oral care experience currently, with six reporting frequent use of swabs. Seven participants reported using toothbrushes occasionally and two reported using them frequently. All participants reported undertaking denture care as a nursing student but few reported providing any oral care frequently.

#### **Questionnaire emotional reactions towards different scenarios**

All participants reported emotions of disgust, anxiety and satisfaction in response to one or more questions. Emotional self-report varied for the different questions (e.g. touching the mouth or brushing the teeth) and there were distinctions between disgust, satisfaction and anxiety responses. The intensity of emotion expressed in the questionnaire responses was similar to the intensity expressed in the interview language.

Clean oral care images evoked little disgust or anxiety and were rated on the first or second lowest ratings on the scale, as shown in Table 3.6. Participants reported a greater intensity of emotion towards seeing unpleasant images.

Participants reported empathetic (as a patient I would feel) emotional anxiety and disgust towards the scenarios. Those who expressed empathetic disgust towards the least unpleasant scenarios reported disgust towards unpleasant scenarios.

### **Moral emotions towards oral care behaviour**

Moral disgust, anxiety and a lack of satisfaction towards not providing oral care were reported in questionnaire responses to scenarios as shown in Table 3.6. These moral emotions were more intense towards the most unpleasant scenarios. Participants were less disgusted or anxious leaving the patient without care towards the least unpleasant scenarios.

**Table 3.6 Median, maximum and minimum emotion ratings for questions and scenarios in the pilot questionnaire study**

	Question	Scenario																										
		1 (Image 1)			2 (Image 2)			3 (Image 3)			4 (Image 4)			5 (Image 5)			6 (Image 6)			7 (Image 7)			8 (Image 8)			9 (Image 9)		
		Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min
Attention Cues	How would you feel seeing this scenario? (disgusted)	2	4	1	1	2	1	1	2	1	1	3	1	1	2	1	2	5	1	2	5	1	3	5	1	4	5	1
	How would you feel seeing this scenario? (anxious)	3	4	2	1	2	1	1	2	1	2	5	1	1	2	1	3	5	1	3	5	1	4	5	1	4	5	1
	If you were the patient how would you feel about this (disgusted)	4	5	2	3	5	1	3	5	1	3	5	1	3	5	1	4	5	1	4	5	1	4	5	3	4	5	2
	If you were the patient how would you feel about this? (anxious)	4	5	2	3	5	1	3	4	1	3	5	1	3	4	1	3	5	1	4	5	3	4	5	3	4	5	2
Physical Emotions	How would you feel touching this scenario? (disgusted)	1	2	1	1	2	1	1	2	1	2	5	1	1	2	1	3	5	1	2	4	1	3	4	1	2	5	1
	How would you feel touching this scenario? (anxious)	2	3	1	1	1	1	1	2	1	2	5	1	1	2	1	3	5	1	3	5	1	4	5	1	4	5	1
	How would you feel while brushing these teeth? (disgusted)	1	3	1	1	2	1	1	2	1	1	4	1	1	2	1	2	5	1	2	4	1	3	4	1	2	5	1
	How would you feel while brushing these teeth? (anxious)	3	4	1	1	3	1	1	4	1	2	5	1	1	3	1	3	5	1	3	5	1	4	5	1	4	5	1
	How would you feel while brushing these teeth? (satisfied)	3	4	2	4	5	1	4	4	2	3	5	2	4	4	2	3	5	1	3	5	2	3	5	1	3	4	1
Moral Emotions	If you did not brush these teeth, how would you feel? (disgusted)	4	5	3	3	5	2	3	5	2	3	5	2	2	5	1	4	5	2	4	5	4	4	5	3	4	5	2
	If you did not brush these teeth, how would you feel? (anxious)	4	5	2	3	5	2	3	5	2	4	5	1	3	4	1	4	5	2	4	5	3	5	5	3	4	5	2
	If you did not brush these teeth, how would you feel? (satisfied)	1	2	1	2	3	1	2	4	1	1	3	1	2	3	1	2	3	1	1	2	1	1	3	1	1	3	1

**Table 3.6 continued, median, maximum and minimum emotion ratings for questions and scenarios in the pilot questionnaire**

	Question	Scenario																										
		1 0 (Image 10)			11 (Image 11)			12 (Image 12)			13 (Image 13)			14 (Image 14)			15 (Image 15)			16 (Image 16)			17 (Image 17)			18 (Image 18)		
		Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min
Attention Cues	How would you feel seeing this scenario? (disgusted)	1	2	1	1	4	1	5	5	1	1	2	1	5	5	1	1	2	1	4	5	1	2	3	1	2	4	1
	How would you feel seeing this scenario? (anxious)	1	2	1	1	5	1	5	5	1	1	2	1	5	5	1	1	5	1	4	5	1	2	4	1	3	5	1
	If you were the patient how would you feel about this? (disgusted)	3	5	2	4	5	1	5	5	3	3	5	1	5	5	3	4	5	1	4	5	3	4	4	1	4	5	2
	If you were the patient how would you feel about this? (anxious)	3	4	2	3	4	1	5	5	3	3	4	1	5	5	3	3	4	1	4	5	3	4	5	3	4	5	3
Physical Emotions	How would you feel touching this scenario? (disgusted)	1	2	1	1	4	1	5	5	1	1	2	1	5	5	1	1	3	1	4	5	1	2	3	1	2	4	1
	How would you feel touching this scenario? (anxious)	1	2	1	1	5	1	5	5	1	1	2	1	5	5	1	1	5	1	4	5	1	2	4	1	3	5	1
	How would you feel while brushing these teeth? (disgusted)	1	2	1	1	3	1	5	5	1	1	2	1	5	5	1	1	2	1	4	5	1	2	4	1	2	4	1
	How would you feel while brushing these teeth? (anxious)	1	3	1	1	5	1	4	5	1	2	3	1	5	5	1	1	5	1	4	5	1	3	5	1	4	5	1
	How would you feel while brushing these teeth? (satisfied)	4	5	2	3	5	2	3	5	1	4	5	1	3	5	1	4	5	1	3	5	1	3	4	2	3	4	1
Moral Emotions	If you did not brush these teeth, how would you feel? (disgusted)	4	5	2	3	4	1	5	5	4	4	5	1	5	5	4	4	5	2	4	5	4	4	5	3	4	5	3
	If you did not brush these teeth, how would you feel? (anxious)	3	5	2	3	4	1	5	5	4	3	4	1	5	5	5	4	5	2	5	5	3	4	4	3	4	5	3
	If you did not brush these teeth, how would you feel? (satisfied)	2	3	1	2	5	1	1	5	1	2	3	1	1	3	1	1	4	1	1	3	1	2	3	1	1	4	1

### **Physical emotions towards the mouth**

Emotional feelings of disgust and satisfaction towards physically touching or brushing in the mouth varied in relation to each situation. Disgust and anxiety ratings were similar in scenarios rated as normal and not disgusting. Emotions towards physically providing oral care were less intense than empathetic and moral emotions. Physical emotion ratings were rated with similar empathetic and moral emotional intensity in unpleasant scenarios. Touching the patient in scenarios rated as unpleasant evoked higher levels of disgust and anxiety as shown in Table 3.7.

One participant reported feeling anxious but not disgusted whilst cleaning the teeth for scenarios rated as the least unpleasant whilst another felt disgusted but not anxious towards the most pleasant of the scenarios. The remaining participants reported that no strong feelings of anxiety or disgust whilst cleaning the teeth in the more pleasant scenarios. However in the most unpleasant scenarios most participants expressed anxiety and disgust whilst cleaning the teeth.

Ten of the eleven participants reported that they would feel satisfaction whilst brushing the teeth in the least unpleasant scenarios. Half of the participants felt satisfied while cleaning the teeth in the unpleasant scenarios whilst half felt dissatisfaction.

**Table 3.7 Self-reported emotional disgust and anxiety towards touching scenarios in the pilot study**

<i>Scenario</i>		<i>Questionnaire response</i>									
<i>Scenario qualitative rating (from card sort)</i>	<i>Scenario description and number</i>	<i>Disgust touching scenario (count) n=11</i>					<i>Anxious touching scenario (count) n=11</i>				
		<i>Rating</i>					<i>Rating</i>				
		<i>1 for not at all 5 for very</i>					<i>1 for not at all 5 for very</i>				
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
1	Clean lateral (2)	9	2	0	0	0	11	0	0	0	0
1	Clean lateral (10)	9	2	0	0	0	9	2	0	0	0
1	Clear saliva (3)	9	2	0	0	0	9	2	0	0	0
1	Front clean (5)	9	2	0	0	0	10	1	0	0	0
1	Clean palate (13)	9	2	0	0	0	8	3	0	0	0
1	Food (15)	10	0	1	0	0	9	1	0	0	1
2	Clean denture (11)	6	2	2	1	0	7	1	2	0	1
2	Clean periodontal (9)	3	3	2	1	2	4	0	0	3	4
2.5	Upper restored palate (4)	5	4	0	1	1	2	6	0	2	1
3	Red gums (18)	2	5	2	2	0	1	3	3	3	1
3	Dirty denture (6)	2	3	2	2	2	3	2	2	2	2
3	Red palate (17)	3	5	3	0	0	2	4	3	2	0
3	Putrid saliva (16)	1	1	0	6	3	1	1	0	5	4
3	Plaque debris (12)	1	0	1	2	7	1	0	1	2	7
3	Blood (1)	6	5	0	0	0	3	5	3	0	0
3	Palate restored hyperplasia (7)	5	3	1	2	0	1	2	3	4	1
3	Red gums (8)	3	1	3	4	0	2	0	3	4	2
3	Severe periodontal disease (14)	1	0	1	0	9	1	0	1	0	9

**Behavioural intention to provide care**

Participants intended to brush the patient's teeth at least once per day in scenarios, two, five, thirteen, sixteen and seventeen. Most participants intended to provide care in the remaining scenarios (Table 3.8).

**Table 3.8 Self-reported intended frequency of toothbrushing behaviour for each scenario in the pilot study**

Scenario		Self-Reported intended frequency of toothbrushing				
Qualitative rating (from card sort)	Description and number	Never	Infrequently	Occasionally	Once per day	Twice or more per day
		n	n	n	n	n
1	Clean lateral (2)	0	0	0	5	6
1	Clean lateral (10)	0	0	1	4	6
1	Clear saliva (3)	0	0	2	3	6
1	Front clean (5)	0	0	0	6	5
1	Clean palate (13)	0	0	0	6	5
1	Food (15)	0	0	1	3	7
2	Clean denture (11)	1	1	1	4	4
2	Clean periodontal (9)	0	1	1	3	6
2.5	Upper restored palate (4)	0	1	2	1	7
3	Red gums (18)	0	1	0	6	4
3	Dirty denture (6)	1	0	1	3	6
3	Red palate (17)	0	0	0	3	8
3	Putrid saliva (16)	0	0	0	2	9
3	Plaque debris (12)	0	1	0	0	10
3	Blood (1)	0	0	1	4	6
3	Palate restored hyperplasia (7)	0	1	1	4	5
3	Red gums (8)	1	0	1	4	5
3	Severe periodontal disease (14)	0	1	0	2	8

### Non-brushing oral care intention

Participants intended to provide non-brushing oral care (using swabs or gauze to clean the mouth) most often in scenarios rated as unpleasant (Table 3.9). Participants were unlikely to provide non-brushing oral care in



scenarios rated as most pleasant. For each scenario at least 2 participants did not intend to use swabs or gauze for care.

**Table 3.9 showing self-reported intended frequencies of non-toothbrushing behaviour with a swab on a stick for each scenario in the pilot study**

Scenario		Intended frequency of use of a swab on a stick for oral care				
Qualitative rating (from card sort)	Description and number	Never n	Occasionally n	Frequently n	Once a day n	Twice a day or more n
1	Clean lateral (2)	8	2	0	1	0
1	Clean lateral (10)	8	3	0	0	0
1	Clear saliva (3)	6	4	1	0	0
1	Front clean (5)	8	3	0	0	0
1	Clean palate (13)	8	3	0	0	0
1	Food (15)	8	3	0	0	0
2	Clean denture (11)	4	3	3	0	1
2	Clean periodontal (9)	4	3	0	4	0
2.5	Upper restored palate (4)	5	2	3	1	0
3	Red gums (18)	2	3	2	4	0
3	Dirty denture (6)	3	4	2	2	0
3	Red palate (17)	4	6	0	1	0
3	Putrid saliva (16)	4	1	2	2	2
3	Plaque debris (12)	3	2	2	1	3
3	Blood (1)	3	4	1	2	1
3	Palate restored hyperplasia (7)	5	3	3	0	0
3	Red gums (8)	2	2	4	3	0
3	Severe periodontal disease (14)	2	1	2	2	4

### **Help seeking behavioural intention**

Most participants intended to ask for help with the scenarios that were rated as most unpleasant with ten of the 11 participants intending to ask for help with scenario 14. In the scenarios rated as least unpleasant, (scenarios 2 and 10), over half of the participants felt they would never refer or ask for help.

### **Triangulation of qualitative interview and questionnaire findings**

Qualitative and quantitative findings reports were similar. Disgust and anxiety valence were greatest in scenarios that had been qualitatively rated during the card sort as the most unpleasant.

Although most participants responded with similar emotional trends to each of the scenarios, there were individual differences in participants' emotional responses towards each scenario. Some of the participants tended to express more or less emotional valence towards situations than the other participants.

### **Oral care and emotion**

Scatterplots to examine relationships between questionnaire variables showed similar emotional responses to similar scenarios. When tested, there were moderate correlations between physical experiences of touching the mouth and brushing the mouth.

### **3.4.3. Discussion of pilot questionnaire methods and responses**

All participants completed the pilot questionnaire and the method was reported to be acceptable. As previously discussed, participants gave similar verbal and questionnaire responses to the same questions in both interviews and questionnaires. These similarities suggest that a questionnaire tool could be used for collecting emotional data towards oral care. This finding agrees with the wider literature as questionnaire tools are well established in emotion research and have been used to examine anxiety (Humphris et al.,

1995a, Humphris et al., 2000, Humphris et al., 2009) and disgust (Olatunji et al., 2010b).

### **Discussion of the questions and response scales used in the questionnaire pilot**

Questions relating to different experiences for example, touching, seeing and not providing oral care yielded different emotional responses; these were confirmed with the interview findings. This agreed with the earlier focus group and interview study findings in this thesis, which suggested that oral care involved a range of activities that were emotionally distinct experiences. Seeing is physically different to touching and while nurses may be able to look away and avoid an unpleasant sight, they need to make a conscious decision to touch the mouth to provide care. Considering these differences, it is possible that important oral care experiences were omitted from the questionnaire tool, however interview responses agreed that included questions were relevant and appropriate for examining emotions towards oral care. This evidence corroborated the use of a range of questions; a range of questions was recommended for future questionnaires.

In the present study, scenarios with tissue damage, dirt and debris in the mouth content were identified as being unpleasant and anxiety provoking. This is similar to the qualitative interview study findings, and to studies of explicit and implicit reactions to the visual appearance of body elimination products (Templer et al., 1984, Ely, 1999) abnormality or disease (Grandfield et al., 2005) tissue damage, blood, (Sawchuk et al., 1999) and disease (Charash, 2004). Emotional questionnaire responses to the content of the images therefore showed similar responses to those seen within the wider literature. This therefore suggests that disgust, anxiety and satisfaction were appropriate emotions for the questionnaire tool.

Study findings showed emotional responses to moral questions. These uncomfortable moral emotions echo the qualitative interview study findings in this thesis. Emotional discomfort is considered to be a driver for action (Festinger, 1962). Nursing care and decisions have been associated with moral emotions (Parker, 1990, Oddi and Cassidy, 1994). Furthermore, work

to hide the physical unpleasantness of seeing and interacting with the dirty mouth as seen in the present study findings can evoke emotional labour in nurses (Goldblatt, 2009). Moral emotions towards oral care are therefore plausible and supported theoretically. Although the intensity of moral experience and the extent of the effect of moral motivation could not be confirmed in the present study, these findings suggested that moral emotions were captured and quantified in the present study and were considered for the next stage of study.

The greatest variation in emotional responses was seen in relation to restorations in the mouth. In these circumstances, participants were unsure of what they were seeing and this agreed with reports from the focus group and interview studies. The implication of this finding for care is that student nurses may not be able to identify the difference between disease and a healthy restored mouth. This was considered an important area for further research. As the aim of the study was to examine emotions towards oral care, and clean and dirty images without restorations gave the clearest responses, the use of minimally restored mouth images only was considered during the development of the next stage of study.

Pilot findings indicated that the least unpleasant scenarios appeared to evoke little emotion and it is possible that student nurses had the least motivation to provide oral care in these scenarios. The implication for such associations is that the needs of patients who do not have oral disease could be ignored. The pilot questionnaire appeared to capture this data and therefore appeared to be appropriate for use in a further study to explore this.

The stability, test-retest validity and reliability of the questionnaire advocated in the literature (DeVon et al., 2007) were not confirmed and in these pilot studies; further questionnaire development and testing was anticipated to overcome this.

## **Discussion of the measurement scales used in the pilot questionnaire study**

In the present study, the Likert scales were based on existing scales for measuring and comparing emotional affect (Watson et al., 1988, Plutchik, 1989, Libkuman et al., 2007). These scales were used in the present study for a number of discrete emotions and appeared appropriate for the study aims. Some theorists consider emotions to be polar opposites (Plutchik, 1989) but it is argued that there is no opposite emotion to disgust (Miller, 1997). The present study used question scales for each discrete emotion and this appeared justified because participants indicated more than one discrete emotion towards each scenario. The use of polar opposites may have reduced the data sensitivity for each emotion within the five-point scale, as only two points of the scale would be used for each emotion. Furthermore few participants indicated no emotion and these findings suggest that a “neutral point” between two emotions would have been inappropriate for the present study.

Emotional reports using these scales showed similar intensity to emotions described in the interviews and so these present study data agree that the scales captured emotional intensity information. Verification of emotion scales with interviews has been used in previous studies (Plutchik, 1989) to confirm questionnaire reports. This agrees that emotions scales in the present study may be used to capture emotional intensity towards oral care however, the precision of the scale was not confirmed in the pilot and may need further investigation.

The present study used a five-point emotions scale to fit within a computer screen layout. Seven-point scales are often recommended for research (Nunnally and Bernstein, 1978), and the relative merits of a five or seven point scale were not tested in the present study. The scale in the present study however appeared to be sufficiently sensitive to detect different experiences but is possible that detailed data were omitted as a result of the condensed scale; therefore further investigation to determine if a seven-point scale would improve sensitivity may be appropriate.

The oral care scales in the present study only captured reports of the presence of specific emotions in relation to stimuli. They did not measure or address the duration of each emotional experience or how often emotional experiences occur. These are both weaknesses of the study, however to address these issues would have lengthened the questionnaire and may have reduced participation and the future usability of the tool. The present questionnaire and scales also did not account for mood, which can influence emotion (Gohm, 2003). No validated measures of participant mood were collected however interview notes were made and there was no evidence to suggest that participants demonstrated signs of negative or positive moods during the interviews. From the evidence collected, none suggested that responses were influenced by mood during the tests or interviews. Furthermore, interview findings did not suggest that the length of time, timeliness or frequency of emotional reactions to oral care would be relevant. This however was considered an area for further investigation at a later point.

No validated emotional tools were identified to measure emotions towards oral care, it was not possible to directly compare questionnaire responses to previous studies. Attitudinal measures were therefore considered as a possible mechanism for comparison with the literature in a further stage of study.

Although participants' responses to scenarios were similar, there were individual differences between reported experiences. Individual differences in emotional responding to presenting situations have been identified in psychology studies (Greenwald and Banaji, 1995, Greenwald et al., 1998, Lane et al., 2007a) and differences in participants' responses to stimuli were therefore an expected finding. These differences may reflect traits (Egloff and Hock, 2001) rather than specific state reactions to oral care situations. The clinical implication for this is that a tendency for a particular emotion, for example, disgust towards all stimuli may need to be addressed in a different way when compared to individuals' reacting only to specific oral care stimuli. Olatunji et al. (2009b) showed that even with repeated exposures to stimuli,

individual differences in sensitivity to disgust remained, while anxiety decreased, therefore approached may also need to be different for different emotions. Therefore an understanding of individual differences in reactivity towards disgust stimuli may be relevant to oral care and the meaning of the findings. This was considered for the next stage of study.

### **Oral care behaviours**

The present study findings showed differences in the intended frequencies of oral care procedures for each scenario. Intended gauze use appeared to increase in the most unpleasant scenarios. These differences in procedures agreed with the qualitative interview study findings. These differences indicated that patient care varied in different care situations agreeing with the use of different scenarios and behaviours.

The results of the pilot showed variations in the oral care procedures for different scenarios. These findings agreed with the proposed theory in the qualitative interview study. Changes to oral care actions and even avoidance in relation to unpleasant and anxiety provoking scenarios are well supported in the theoretical (Lazarus, 1999) and behavioural literature (Endler and Parker, 1990). These results indicate that changes to behaviour were captured by the questionnaire and these measures could be associated with emotion. These measures were therefore considered useful for further studies.

Although it was possible to collect and explore emotion and behaviour data using the questionnaire, there were not enough people in the study to conduct a statistical analysis to examine the relationship between emotion and behaviour. As discussed, the sample predominantly comprised young white British females and confounding variables for emotional responses such as gender and ethnicity were not addressed. These limitations were considered when developing the questionnaire for the next stage of study. As these sample variables may have an influence on emotion and care, they were considered sampling and questionnaire design for the next stage of data collection to understand responses in a larger and more varied population.

### **3.5. Methods for the pilot interview study**

The purpose of the interview study was to identify the meaning of the scenario, images, questions and responses to the questions in the pilot questionnaire.

#### **3.5.1. Methods for the conduct of the pilot interview study**

Interviews were informed by previous studies to validate questionnaires (Forsyth and Lessler, 1991, Blair and Presser, 1993, Presser et al., 2004). Interviews followed the pilot questionnaire (illustrated in Appendix 3.8) and participants were asked to explain their understanding of each of the questions. They were also asked to talk through and describe their thinking for questionnaire answers. A Philips Voice Tracer LFH0662/40 was used to record the interviews.

#### **Interview data preparation, verification and analysis in the pilot studies**

A research assistant transcribed the digital audio interview data into textual documents following the procedures used for the qualitative study in this thesis. The researcher then verified the transcripts.

Interview data were coded thematically using manual transcripts. Analysis was guided by techniques for thematic framework analysis (Aronson, 1994, Attride-Stirling, 2001). Wordlists and theoretical models for emotional terminology also informed analysis (Plutchik, 2000, 2010). The questionnaire and responses to the interviews were used to construct the initial analysis framework. This was developed further in line with thematic analysis, data were then recorded in a table in Microsoft Word 2007 (Microsoft, Redmond, United States of America).

#### **3.5.2. Pilot study interview findings**

When asked about the scenario, nine of the eleven participants described reflecting upon patients that they had seen. The remaining two described general dependency needs of patients who had had a stroke. Participants'



descriptions indicated a common and shared understanding of oral care needs, disability and dependency for the stroke patient.

One student nurse commented on the choice of scenario during the interview:

**Student nurse participant 116:** *“it’s probably the best category of patient to pick coz they’re the most helpless not being able to do much for themselves.”*

Specific cues in the scenario were meaningful. For example, a number of participants felt that the patient in the scenario would find it difficult to self-care because of the loss of function in the arm. Participants also commented that when unable to communicate with nursing staff, patients could have difficulty in saying what they needed, or if care provided was causing pain as illustrated below. The implications for care were that greater communication skills needed to be employed.

**Interviewer (prompt):** and speech difficult to understand...

**Student nurse participant 118:** *yeah they might not be able to tell me if I’m hurting them or where it hurt or what they felt.*

Participants described a greater sense of responsibility and emotion towards providing care when the patient was allocated to them for care. These feelings were further reinforced when their patients asked student nurses for help. They also indicated that the care provided may change in a different scenario. Responsibility towards a patient who was not theirs is illustrated below:

**Interviewer (prompt):** On the wards you have certain patients who are yours?

**Student nurse participant 101:** *Oh yeah, well I believe it would be their responsibility then. But if a patient asked me to help them then I would, that’s how it works.*

Terminology used was similar for all participants. Participants described “Brushing” as toothbrushing inside the mouth. Participants interpreted the term “using a swab” as using a pink swab on a stick.

Participants interpreted the terms “occasionally” and “frequently” differently. For some, frequently meant two or three times a week while for others it meant daily.

Images were reported to represent a range of patient oral care conditions that could be seen on the ward. When asked about seeing the patient in the pictures, participants described how they felt seeing the picture or the content of the picture.

### **Interview responses using the questionnaire as a guide**

Participants reported that tissue damage looked uncomfortable or painful for the patient. In these situations, they described needing to provide care and being anxious and disgusted as a patient. Participants expressed very little anxiety or disgust towards scenarios with clean images with most indicating that they were less concerned about normal and clean appearances and this could change their behaviour as illustrated below.

**Student nurse 110:** *No I wouldn't be so worried about number fourteen. I don't know, I wouldn't be desperate to go and clean their teeth. I wouldn't think it was the end of the world if I didn't brush them, if I didn't have time.*

Some participants described being unsure when they saw fillings and crowns as shown below. Participants reported that these uncertainties changed their approach to care and their feelings.

**Interviewer:** Is there anything with that picture that made you feel uncomfortable?

**Student nurse 317:** *I think it was this bit here.*

**Interviewer:** *Ok just around here [pointing to the fillings and the crown]?*

**Student nurse 317:** *Yeah, It looks sort of decayed there.*

Not providing care made participants feel uncomfortable. A small number of participants reported that dissatisfaction should be used for questions about not providing care as that better represented their feelings. Many described emotions of disgust and anxiety, guilt and dissatisfaction towards not providing care as shown below.

**Interviewer:** *And if you didn't brush the teeth how would you feel?*

**Student nurse 116:** *I'd be very disgusted at myself not anyone else. Erm, I'd be anxious the longer they were left unattended the more the anxiety. I'd be scared what's lurking in there for when I did brush them. I'd be afraid of causing more damage. But the longer they'd remained dirty the greater my satisfaction when I did clean them.*

Participants felt most comfortable providing care for the scenarios with clean images and were most uncomfortable providing care for scenarios with tissue damage. In situations where there was evidence of tissue damage, participants described changing the way they delivered care. Some of the participants described how they take extra care or be extremely gentle around areas that looked sore. Most described tooth brushing as the best way to clean teeth. But some of the participants described pink swabs or mouth rinses as being gentler for sore areas. Discomfort providing care is illustrated below:

**Interviewer:** *How would you feel while brushing these [dirty image]?*

**Student nurse 118:** *Dunno, like made my stomach churn a little bit.*

Student nurses who were currently caring for fully independent patients indicated that they used other placements where they had been caring for stroke patients or were able to carry out oral care as a basis for their responses. Care frequencies, which specified times per day, were clearly interpreted. The terms occasional and infrequent described as sporadic care.

When describing oral care, participants spoke of needing to ask for help when they did not know what to do. They stated that they would ask for help from their peers, their mentors or dentists. Participants were comfortable to carry out care without any assistance in scenarios with no tissue damage, and most needed help where they were anxious about not knowing what to do, feeling unable to help or causing damage to the patient.

**Interviewer:** *And asking for help?*

**Student nurse 116:** *Erm, if it were just normal teeth like that then no, but if there's blood, pus something like that then I'd always refer, especially coz I don't know what it is.*

Participants did not report the need for any further scenarios in the questionnaire. They however reported that at times it felt long and repetitive.

### **3.5.3. Discussion of interview methods and findings**

Pilot study interviews were conducted for the purpose of understanding the content of the questionnaire and the responses to the questionnaire. The additional details and confirmation of questionnaire findings generated by the interviews suggested that the interview study contributed to a further understanding of the questionnaire and responses to it. These data agreed that the scenario, images, questions and scales were appropriate for collecting emotional data.

Similar to the card sort, it is possible that self-reported interview data using the questionnaire as a basis for discussion were affected by the order of administration of the tests. However, Redline et al. (1998), demonstrated that when examining interviews after a self-administered questionnaire, findings were no less informative, which suggests that the order should not have affected the findings however they did not test this with emotions.

In the present study, scenarios were used as a basis for self-report because the initial focus group and interview studies in this thesis indicated that without a specified situation, oral care scenarios and terms may not be consistently interpreted. Interview findings in the present studies confirmed participants had similar interpretations of the scenarios and were able to imagine the patient described, suggesting that the scenario could be a stable base for emotion questions.

No studies with descriptive scenarios as a basis for oral care were identified in advance of the study and so present study findings could not be directly compared to existing literature. Vignettes are however established as a

technique for contextualised social and moral emotional research (Robinson and Clore, 2001, Jones and Fitness, 2008). Present study findings suggest that the use of a scenario and images may improve the interpretation and therefore the internal validity of questionnaire items in relation to oral care.

Interview responses in the present study were similar to questionnaire findings, which suggests that questionnaires captured participants' explicit responses to the stimuli. Although emotions and the intensity of these emotions was not quantified in the interview, the findings suggested that similar emotions were expressed in the questionnaires and interviews. The interview findings therefore agreed that the questionnaire could capture emotions and the intensity of these experiences.

The interview findings also indicated that revisions to the questionnaire could improve acceptability and potentially improve participation. For example the questionnaire was considered too long and repetitive. This indicated that developing and shortening the questionnaire would be appropriate for future studies.

### **3.6. Methods for the Stroop test**

The Stroop test study was developed to explore participants' implicit reactions to oral care stimuli.

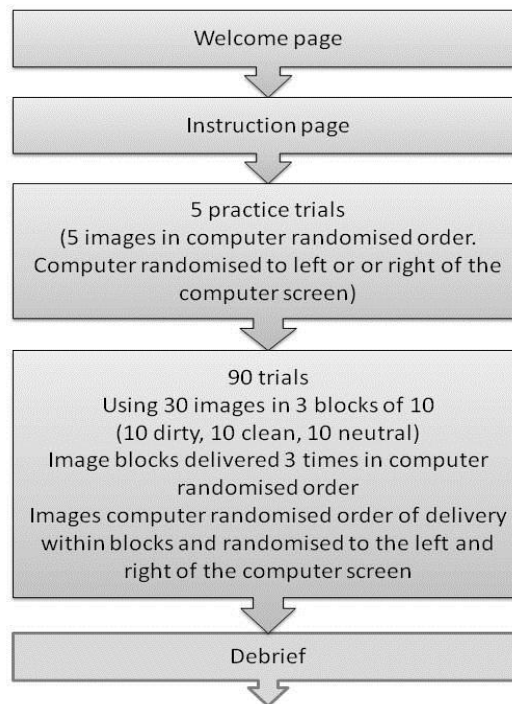
#### **Stroop test images**

Digital images developed for the questionnaire were sized using Office Picture Manager, (Microsoft, Redmond, United States of America) and Microsoft Paint (Microsoft, Redmond, United States of America) to 600 pixels by 400 pixels for the Stroop test. This measurement was based upon example tests in the Stroop test software.

#### **Software**

A range of software programs for reaction time tests were identified and DirectRT (Blair, 2010) was selected for ease of use. A file for DirectRT to run the Stroop test was created to deliver a welcome page, instructions, five practice trials, 90 test trials and a debrief as specified in a flow chart (Figure 3.3).

**Figure 3.3 Flow chart of Stroop test trials in the pilot study**



### **Stroop test design**

Test design followed the literature for Stroop tests and associated brain activity using images (Liu et al., 2004) and studies of emotional faces (Waters et al., 2010). It also followed examples in the DirectRT software. Methods considered to improve the quality of emotional Stroop tests, such as the administration of stimuli in blocks were identified and used in the development of the study (McKenna and Sharma, 1995).

Welcome, instruction, and debrief pages were produced for the tests. Three sets of images were selected for the Stroop tests. In total 30 images were included; these comprised 10 validated “neutral images” from a research image bank, 10 “clean” mouth images, and 10 “dirty” images, plaque related oral conditions prepared for the studies (Appendix 3.10). Five images from a picture bank were used for the practice trials. The programme was preset to deliver a trial duration of 1000 milliseconds on a 1600x900 sized screen.

### **Stroop test picture presentation**

Practice trials involved five practice images presented once, each in a random order. The 90 test trials were delivered in blocks of ten dirty, clean and neutral images. Image blocks were delivered three times, each of the ten images within each block was delivered once per block. Blocks and images in blocks were computer randomised for each participant (Figure 3.3).

The programme was set up to deliver vertically central images in a computer randomised horizontal position to the left or right of the centre of the computer screen. Image locations were set at 48 pixels horizontally for a left of centre picture and 52 pixels horizontally for a right of centre picture. Participant response keys were allocated to z for images presented to the left of centre and / for images presented to the right of centre.

### **Piloting the Stroop test**

The Stroop test was run 17 times with different department staff in the School of Dentistry to ensure that the programme was delivering the tests effectively and that the results were being recorded.

### **Administration of the Stroop test**

Stroop tests were conducted under the same conditions as the questionnaires; however a heart rate monitor and sound reducing headphones were used. Tests started with welcome and instruction screens, which guided participants through the tests (Appendix 3.11). Computer instructions, directed participants to press the start and stop button on the heart rate monitor at the appropriate time. At the end of the Stroop test participants were instructed to indicate that the test was completed.

### **Cleaning and checking of Stroop test data**

Stroop test data were uploaded to SPSS version 18 software (IBM Inc, New York, United States of America). Data were checked and cleaned using procedures described in Tabachnick and Fidell (2007). Stroop reaction time data were skewed to the left and were log transformed. Transformed data



were examined for normality using histograms, q-q plots, skewness and kurtosis. Kolmogorov–Smirnov and Shapiro–Wilk tests. Six outliers were identified. Analyses were undertaken with and without outliers to confirm that these did not influence the results.

### Stroop test analysis

Analyses were undertaken in accordance with established methods for Stroop tests in following examples presented in previous studies (Mead et al., 2002, Waters et al., 2010).

### Analyses of Stroop reaction times

Tests initially compared mean reaction times for each stimulus using a one-way ANOVA. Post hoc Tukey HSD tests were then used to compare pair wise results (Table 3.10). A repeated measures ANOVA was then used to test the effect of stimulus and block on reaction times.

**Table 3.10 Stroop test analysis in the pilot study**

Test 1 and post Hoc Tukey HSD tests									
One way ANOVA									
All participants	Neutral Stimuli			Clean Stimuli			Dirty Stimuli		
	Mean reaction time			Mean reaction time			Mean reaction time		
Test 2 Repeated measures ANOVA									
	Neutral Stimuli			Clean Stimuli			Dirty Stimuli		
All participants	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3
	Mean reaction time	Mean reaction time	Mean reaction time	Mean reaction time	Mean reaction time	Mean reaction time	Mean reaction time	Mean reaction time	Mean reaction time

### Tests to check Stroop test response data

Kruskal Wallis tests were used in order to confirm that median reaction times were similar for images within blocks.

Correct and incorrect responses were compared for each stimulus block and for each image using Ggobi software (Swayne et al., 2008) and Mann-Whitney U Tests in order to confirm that Stroop test results were not influenced by incorrect responses

### **Data linking**

Median qualitative ratings, questionnaire and Stroop test datasets were linked through images and unique participant numbers and entered into a single data file for SPSS. Data checks to confirm accuracy were made later.

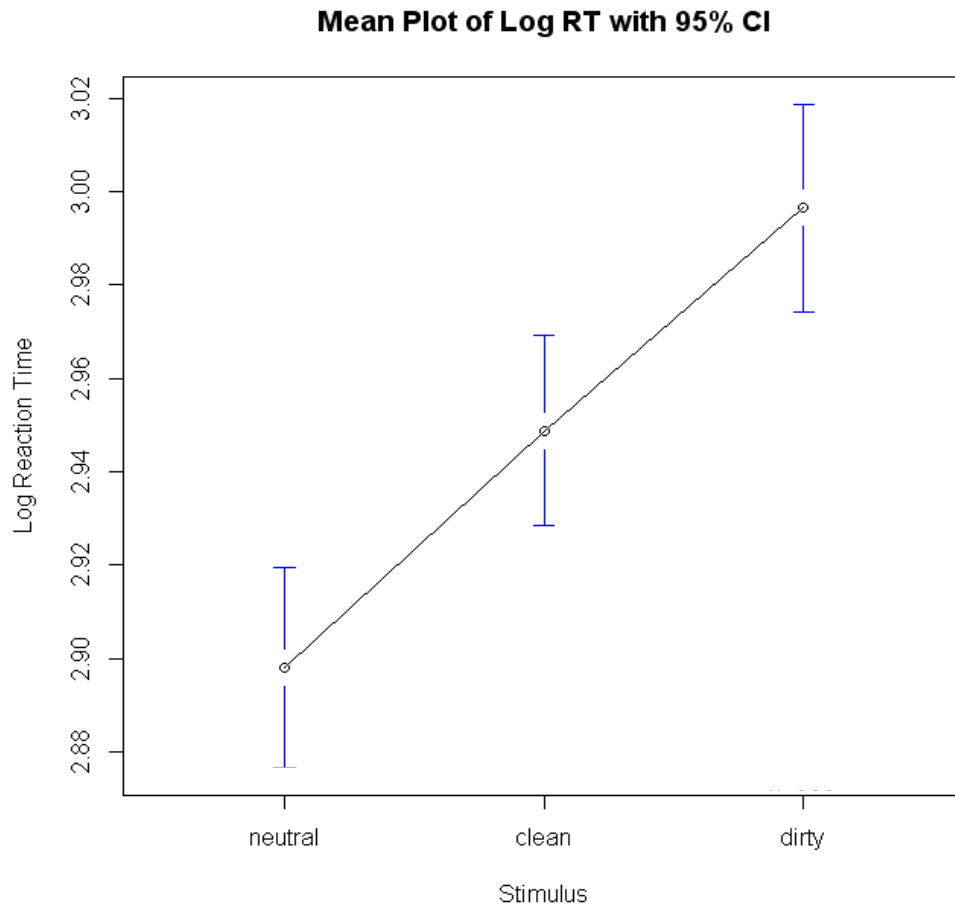
### **Results for the Stroop tests**

The eleven participants took part in a total of 55 practice tests, 110 neutral practice tests and 990 Stroop tests. Stroop test reaction times were slowest for dirty mouth image stimuli and were fastest for neutral mouth stimuli. This indicated an interference effect for dirty mouth stimuli.

### **One-way ANOVA to compare mean reaction times for tests with neutral, clean and dirty stimuli**

The one-way between subjects ANOVA to compare mean reaction times (Appendix 3.12) showed significant differences ( $p < 0.001$ ) between neutral, clean and dirty stimuli [ $f(2, 977) = 23.213, p = 0.000$ ] (Figure 3.4).

**Figure 3.4 Plot for the mean log of the Stroop reaction times for tests with neural, clean and dirty stimuli with confidence intervals (n=11) in the pilot study**



### **Post hoc tests**

Post hoc comparisons using Tukey's honestly significant difference (HSD) test showed the mean Stroop reaction time for the neutral images ( $m=2.89$   $sd=0.19$ ) was significantly different to clean ( $m=2.94$   $sd=0.18$ ) and dirty ( $m=2.99$   $sd=0.20$ ) stimuli (Appendix 3.13) test reaction times.

### **Two way repeated measures ANOVA to compare the effect of stimuli and block on mean reaction times**

The repeated measures ANOVA for variance between stimuli and blocks showed that reaction times for each of the blocks of dirty images were significantly than clean and neutral stimuli [ $f(2, 20)=11.425$ ,  $p=0.000$ ].

Although reaction times for blocks delivered earlier in the tests appeared slower than those taken later, the repeated measures ANOVA showed no significant main effect of block on reaction times.

### **3.6.1. Stroop test and questionnaire**

Exploratory scatter and parallel line plots to explore the relationships between Stroop test results and questionnaire findings showed no trends.

### **3.6.2. Discussion of the Stroop test findings**

Stroop tests were undertaken for the purpose of exploring student nurses implicit reactions to oral care stimuli. These test findings indicated that student nurses responded implicitly to the oral care stimuli in the tests. This suggested that implicit responses were relevant to oral care.

Stroop tests were undertaken using established techniques however; there are a number of approaches that can be used for Stroop tests with images. For example, identifying coloured filters or frames around images (Constantine et al., 2001, Honk et al., 2001, Gallagher-Duffy et al., 2009). No study has proven the superiority of one approach above another (MacLeod, 1991). Tests used in the present studies have been previously used to demonstrate attention effects associated with emotions (Wagner et al., 1997, Constantine et al., 2001, Olatunji, 2006).

In the present study, dirty mouth stimuli were associated with significantly slower reaction times when compared to neutral or clean stimuli. This finding was similar to studies of implicit reactions using images of dirty and unpleasant stimuli (Sawchuk et al., 1999, Grandfield et al., 2005, Huijding and de Jong, 2007). Increased Stroop reaction times have been associated with an attentional interference (De Ruiter and Brosschot, 1994, Egloff and Hock, 2001, Jones et al., 2002) and the present study findings agreed with these existing studies that showed similar interference effects towards unpleasant stimuli. Therefore it is plausible that explicit and implicit reactions to the stimuli were associated with unpleasant emotions. Further tests of

implicit responses with using emotion terminology to explore the meaning of the implicit responses were indicated as a result of these findings.

As discussed, findings in this pilot demonstrated Stroop responses towards the greatest emotional content, suggesting that the test measured an implicit emotional response towards oral care stimuli. The emotional Stroop test was therefore useful for further studies to investigate implicit emotions alongside self-reported explicit emotion.

### **3.7. Heart rate tests**

Two Polar s610 heart rate monitors were prepared to record the heart rate data at five second intervals. Data were collected using a chest strap and then download from the heart rate monitors using an infrared link and polar precision, these were tested in advance of the study.

#### **Heart rate data**

Heart rate data were recorded at 5 second intervals and exported from the heart rate monitor as .txt files. These were imported into Microsoft Excel 2007 (Microsoft, Redmond, United States of America) and timeline for each test was created. Heart rate data were recorded along this timeline for each participant alongside the type of image block being delivered at that time (i.e. clean). The mean heart rate during each image block was calculated in Microsoft Excel 2007 (Microsoft, Redmond, United States of America).

#### **3.7.1. Pilot heart rate test results**

No trends were observed for heart rate activity during the Stroop tests.

#### **3.7.2. Discussion of pilot heart rate test findings**

Heart rate varies with emotion (Lane et al., 2009) and data were collected in order to confirm physical signs of emotional responses to stimuli. Discrete emotions have been shown to have different heart rate responses and although most emotions are associated with an increase in heart rate, disgust is associated with a decrease in heart rate (Rohrmann and Hopp, 2008). However, although the use of heart rate data was justified, problems were identified and data did not corroborate or refute the present study findings. As questionnaire results showed evidence of mixed emotional responses of both anxiety and disgust in relation to oral care image stimuli, it is possible that the conflicting responses to these emotions affected the results; it is also possible that no emotions were evoked. In addition, stimuli were shown and changed very quickly during the Stroop tests, because of

this; there may not have been sufficient time for the heart to return to normal before reacting again. Adjustments to the administration of heart rate tests were considered but because these would have involved adding additional time to the tests, and it was considered that Implicit Association Tests may be provide more meaningful emotion data within the available time and therefore Heart rate tests were not continued for the subsequent stages of study.

### **3.8. Review of tests and analyses**

Although presented separately, these studies were conducted on a single sample of participants. Data from all of the studies were qualitatively compared to examine similarities and differences in responses. Consistencies and inconsistencies between interview, card sort data, questionnaire responses, Stroop test reaction times, heart rate data were examined systematically.

The pilot study was also subject to on going review. Results of the initial pilot work were considered in detail and data collection was stopped after eleven responses had been collected. A number of administrative issues were raised which included participation, the length the questionnaire, potential differences between emotion and attitudinal responses, the influence of differences in individual sensitivity to disgust and the meaning of implicit reactions to oral care scenarios.

### **3.9. Summary of results**

#### **3.9.1. Explicit measures**

- Emotions were explicitly reported towards oral care stimuli during completion of the computer delivered questionnaire, during the interviews and during the card sort.
- Student nurses' accounts of oral care scenarios and the specified oral care terms were similar.
- Scenarios, images and procedures in the study reflected student nurses' oral care experiences on the wards.
- Self-reported emotional questionnaire questions and responses were consistent with interview findings.
- Different explicit emotional reactions were reported for different scenarios and images rated as unpleasant evoked greater emotional disgust and anxiety than clean images.



- Student nurses experienced empathetic disgust and anxiety towards oral care.
- Student nurses did not have the same emotional reactions to each scenario.
- Not carrying out oral care evoked anxiety, disgust and dissatisfaction.
- Student nurses did not intend to provide the same oral care procedures in each scenario.

### **3.9.2. Implicit measures**

- Mean Stroop test reaction times were different for dirty, clean and neutral image trial blocks.
- Stroop reaction times were significantly slower for Stroop tests with dirty oral care images compared to clean and neutral images.

## **3.10. Discussion of Pilot Results**

### **3.10.1. Introduction**

This discussion concludes the third chapter in this thesis and follows discussions from each of the subchapters. It commences by discussing methods and studies in this thesis and draws findings of the pilot studies together. This leads into the final chapter of this thesis.

Following the identification of emotions in Chapter two, the purpose of the pilot studies was to test methods for the measurement of nurses' emotions towards oral care. These pilot studies developed components of a questionnaire tool to measure emotions towards oral care. Explicit methodological approaches were used to examine and verify the component parts of the tool and implicit tests were undertaken to explore the relevance of implicit emotions. The aim of the studies was achieved but these pilot studies had limitations and further studies were indicated to meet the aims and objectives of the thesis. The strengths and limitations of the pilot studies will therefore be considered, commencing with the pilot methods.

### **3.10.2. Discussion of the methods used in the pilot studies**

Pilot studies used a range of methodological approaches for implicit and explicit emotional data based upon existing measures for the collection of emotional data Mauss and Robinson (2009). The use of multiple data sources is considered to allow a greater understanding to emerge (Tritter, 1995) and the similarities and depth of information collected in the pilot suggest that this was an appropriate approach for developing an understanding of motions towards oral care.

#### **Recruitment and administration**

The study population was drawn from a pool of student nurses undertaking the same course of study. This focus on one group of nursing professionals may have helped to control for variations of experience. The focus group

and interview study findings in this thesis showed similar emotions and behaviours for student nurses and qualified nurses and so there is no evidence to suggest that the present data could not be tested and then applied to the wider nursing population.

Recruitment was a slow process for the pilot studies. Some of the student nurses reported being unable to participate due to the time commitment to physically attend for tests. As a result, it is possible that those who were least interested did not participate which may have biased the sample. The present findings should therefore not be considered for explaining the emotional reactions of the nursing population and should instead be considered exploring experiences and developing methods to capture emotions.

### **Discussion of methods and findings from the explicit studies in the pilot studies**

Explicit methods included card sorting, interviews and pilot questionnaires and expanded upon findings of the first study in this thesis by providing a structured approach for quantifying and measuring emotions. Pilot methods developed and tested oral care stimuli, which were used as the basis of explicit self-report for emotions. These measures were developed to ensure that questions were interpreted consistently and the findings of the studies indicated that this had been achieved.

Participants reported similar understandings of the patient scenario and findings indicated that changes to the scenario would change both emotional and behavioural responses. The implications of this are that a patient's care could change in different situations, which agrees with the focus group study findings earlier in this thesis. The effect of changing a scenario was therefore considered to be relevant to further studies.

Explicit and implicit tests used the same images based on data from the initial focus group and interview studies. Images have commonly been used in previous studies of emotion, for example images have been used to evoke emotional disgust (Olatunji et al., 2009a, Broderick et al., 2013). Many

previous studies have used images with validated emotional valence ratings from the International Affective Photographic System image bank (Lang et al., 2008). Images from a picture bank may have been more robust for the present studies, but no suitable images were located. Images were therefore produced for the purpose of the present study based on the initial qualitative research in this thesis. The emotional content of these images was confirmed by the card sort activity and these images appeared appropriate for the questionnaire.

Participants' verbal responses towards images in the card sort involved words associated with disgust (Bradley and Lang, 1999, Strauss and Allen, 2007, Princeton University, 2010). They also reported anxiety, disgust and satisfaction towards both interviews and questionnaires. These findings agreed with both models developed in Chapter two of this thesis and studies of emotion and images. The emotions reported and the intensity of these emotions varied in relation to the scenarios in each of the explicit studies. This suggests that the scenarios and emotions selected for study were relevant to oral care and that the questionnaire methods captured these feelings. In the absence of an existing tool, this questionnaire and these emotions therefore appeared appropriate for investigating emotions towards oral care.

There were variations in reported emotions given in response to the different questions in this study which indicated that the questionnaire captured variations in emotions towards different experiences. This finding was corroborated by the interviews in accordance with established methods (Redline et al., 1998), further agreeing with the use of the questionnaire for capturing the range of emotional experiences towards oral care in further studies.

Explicit questionnaire responses could not be compared to previous studies of emotions towards oral care. It was not possible to determine if responses related to individual differences in personality or response tendencies for example sensitivity to disgust (Druschel and Sherman, 1999) which can affect emotional responding. As disgust was reported in all three explicit

studies, a measure of sensitivity to disgust was recommended for the initial stages of further investigations of emotions towards oral care (Haidt et al., 1994).

Although the questionnaire was considered to be an appropriate method of collecting self-report data, participants reported that it was too long and impractical for student nurses working on shifts. This was considered important for the design of the next stage of the study.

### **Discussion of methods and findings from the implicit studies in the pilot studies**

Stroop test findings indicated that student nurses had implicit responses towards oral care stimuli. The Stroop effect was seen in relation to unpleasant stimuli, which agrees with the literature (Van Hooff et al., 2008). It is however possible that Stroop test reactions were seen because of attention to threats (Cohen et al., 1990) or as a result of positive emotions (Williams et al., 1996). As Stroop test findings only showed reaction times to response to the given stimuli, no meaning was derived from this response and these alternate explanations could not be excluded. These tests suggested that implicit emotions appeared relevant and the Stroop test appeared to be appropriate for indicating the presence of implicit emotions in further stages of research. A further measure of implicit emotion with words and meanings was however recommended for future research to further explore the meaning of these implicit responses.

The heart rate study did not show any emotional variation. The reasons for this have been considered in the discussion. As this study did not add information or understanding to the study and the timeframe of the studies needed to be reduced to improve acceptability, this test was not recommended for the next stages of this research.

An overview of the studies, analyses, key findings and the strengths and weaknesses of each study are presented in Table 3.11.

**Table 3.11 Summary and overview of the pilot study tests, data, analyses, key findings and the strengths and weakness of the tests**

Data source	Data	Purpose	Analysis	Key findings	Strengths and weaknesses
<b>Card sort</b>	Textual data	Identify concepts and towards in interviews	Thematic analysis Median emotion rating score	Participants associated the images with disgust  Emotional intensity varied towards each image  Some images, such as those with restorations were not interpreted consistently	<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Simple and quick method</li> <li>• Participants were free to categorise images in any way that they chose, which showed which emotions were most associated with the images</li> </ul> <p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• A more complex method may have produced more detailed data about how images ranked against each other</li> <li>• Potential bias as only tested on a small, predominantly white female sample</li> </ul>

Data source	Data	Purpose	Analysis	Key findings	Strengths and weaknesses
<b>Interview</b>	Textual transcript	<p>Examine the meaning of the patient scenario, image scenarios, questions, response scales and responses to the questionnaire</p> <p>Confirm how appropriate the patient scenario, image scenarios, questions, response scales were for collecting emotional data</p> <p>Triangulate questionnaire responses with interviews to confirm similar content</p>	<p>Thematic analysis of the patient scenario, image scenarios, questions, response scales and responses to the questionnaire to identify the meanings of these.</p> <p>Data triangulation to confirm questionnaire content and responses</p>	<p>Improvements to the length and content of the questionnaire were identified</p> <p>Patient descriptive scenario confirmed as appropriate for nursing</p> <p>Similar interpretations of patient descriptive scenario</p> <p>Images in the context of the questionnaire evoked emotions of disgust anxiety and satisfaction</p> <p>Emotional responses varied in relation to each scenario</p> <p>Emotional responses to the interviews were similar to those in the questionnaires indicating that the questionnaire captured emotional responses</p>	<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>Participant interpretation of patient scenario, image scenarios, questions and responses explained</li> <li>Interviews confirmed variations in emotional responses and behaviours for different scenarios</li> <li>Questionnaire data were similar to interview data indicating that an appropriate questionnaire was appropriate</li> </ul> <p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>Not all data was directly comparable to the questionnaire as interview data did not quantify responses</li> <li>Interviews based on the questionnaire were too long</li> <li>Potential bias only tested on a small, predominantly white female sample</li> </ul>

Data source	Data	Purpose	Analysis	Key findings	Strengths and weaknesses
Questionnaire	Ordinal data          Nominal data	Examine participant ratings for: <ul style="list-style-type: none"> <li>• Previous experience of oral care</li> <li>• Disgust (physical and moral) towards the mouth and oral care</li> <li>• Anxiety (physical and moral) towards the mouth and oral care</li> <li>• Anxiety, disgust and satisfaction when cleaning the teeth</li> <li>• Behavioural intention in each scenario</li> </ul>	Examination of response frequencies using <ul style="list-style-type: none"> <li>• Data s</li> <li>• Bar plots</li> <li>• Scatter plots</li> <li>• Parallel plots</li> </ul> Contingency tables and Chi-squared tests	Emotions towards oral care varied in each scenario  Anxiety and disgust responses appeared to be related but were still distinct from each other.  Moral emotional reactions appeared to be distinct from physical reactions  Behavioural intentions were different for each scenario  The most unpleasant situations evoked similar emotional and behavioural responses	<b>Strengths</b> <ul style="list-style-type: none"> <li>• Questionnaires appeared to capture emotional responses and variations in reactions</li> <li>• Questionnaire appeared to capture behavioural intentions and variations in these</li> <li>• Responses agreed with responses to the card sort, and interview confirming the content of the questionnaire</li> </ul> <b>Weaknesses</b> <ul style="list-style-type: none"> <li>• Emotion scales not fully verified</li> <li>• Questionnaire was too long</li> <li>• The questionnaire was repetitive</li> <li>• The questionnaire was measuring intentions and not actual behaviours</li> <li>• Individual differences to stimuli for example sensitivity to disgust were not measured</li> <li>• Attitudes to oral care were not measured or compared</li> <li>• Potential bias as only tested on a small, predominantly white female sample</li> </ul>



Data source	Data	Purpose	Analysis	Key findings	Strengths and weaknesses
<b>Stroop tests</b>	Continuous time (s) data	Reaction time data for clean, dirty and neutral image blocks <ul style="list-style-type: none"> <li>Grouped data across all participants</li> <li>Individual reaction times per block</li> </ul>	Histograms Tests for normality <ul style="list-style-type: none"> <li>Q-Q plots</li> <li>Kolmogorov–Smirnov</li> <li>Shapiro–Wilk</li> </ul> Stroop test reaction times for different stimuli <ul style="list-style-type: none"> <li>One-way ANOVA</li> <li>Post hoc Tukey HSD</li> </ul> Stroop test reaction times for blocks and different stimuli <ul style="list-style-type: none"> <li>Two way repeated measures ANOVA</li> </ul>	Implicit responses were different for clean, dirty and neutral images	<b>Strengths</b> <ul style="list-style-type: none"> <li>Identified implicit reactions</li> <li>Demonstrated different implicit reactions to the different stimuli</li> <li>Longer response times for dirty stimuli agreed with the theory that unpleasant stimuli attract attention</li> </ul> <b>Weaknesses</b> <ul style="list-style-type: none"> <li>Responses to the stimuli were not associated with words and the meaning of the implicit responses was not clear</li> <li>Potential bias as only tested on a small, predominantly white female sample</li> </ul>
<b>Heart rate data</b>	Time series numeric	Heart rate data recorded at 5s intervals	Timeline plot for heart rate during administration of each Stroop stimuli		<b>Strengths</b> <ul style="list-style-type: none"> <li>Measured heart rate</li> </ul> <b>Weaknesses</b> <ul style="list-style-type: none"> <li>Heart rate had insufficient time to return to normal</li> <li>Disgust is associated with a decrease in heart rate whilst anxiety increases thus creating conflicts as both emotions were identified</li> </ul>

### **3.10.3. Conclusion of the discussion for the pilot studies**

In conclusion, these studies showed that it was possible to capture emotional data using these methods but the population used was small and were not generalisable to the wider population.

These findings suggest that emotions towards oral care may be measured using a questionnaire with oral care scenarios and images however that also indicated that refinements were required to improve the acceptability of the tool.

Findings suggest that the pilot studies captured moral and physical disgust and disgust related anxiety towards oral care. They indicated that oral care behaviours were measured and patients with different oral conditions do not receive the same care. The present study also demonstrated both implicit and explicit emotions towards oral care stimuli. Although disgust was identified, these studies did not examine sensitivity for disgust or the meaning of the implicit Stroop reactions towards oral care. As these may be important for oral care and these may need to be considered for further study. These studies therefore suggest that the questionnaire and Stroop tests in these pilot studies may be used in a larger sample to explore emotions towards oral care.

Implicit data appeared to be relevant but responses were isolated from meanings and so implicit data had limited meaning. A further stage of study was indicated using a refined tool, a meaningful measure for implicit response and a larger sample.

In conclusion, these studies showed that it was possible to capture emotional data using these methods but the population used was small and could not be used for the wider population.

These findings suggest that emotions towards oral care may be measured using a questionnaire with oral care scenarios and images however that also indicated that refinements were required to improve the acceptability of the tool.

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#### **3.10.4. Summary of Discussion**

- Questionnaire findings indicated student nurses report explicit emotion towards oral care.
- Questionnaires with oral care scenarios and images may be used to capture emotional data towards specific oral care scenarios, however tools for this need to be acceptable to student nurses.
- Emotional responses and intended oral care behaviours change in relation to different scenarios.
- There is evidence to show that student nurses may vary the care that they provide in relation to the presenting oral care situation and emotion.
- Implicit reactions to oral care stimuli may be relevant to oral care
- The reasons for implicit reactions are not clear and may reflect individual differences in emotional responding.

# Chapter 4

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## **4. Mixed methods studies to investigate student nurse explicit and implicit emotions towards oral care**

### **4.1. Introduction**

This, the final chapter in this thesis, describes the mixed methods studies undertaken to collect, examine and compare student nurses' explicit and implicit emotional responses towards oral care for hospitalised adult patients.

This chapter builds upon the earlier studies in this thesis. It also describes the work undertaken to address issues identified in the pilot, which were the acceptability of the questionnaire, changes to emotions and behaviours in different scenarios, potential differences between emotion and attitudinal responses, the influence of differences in individual sensitivity to disgust and the meaning of implicit reactions to oral care scenarios.

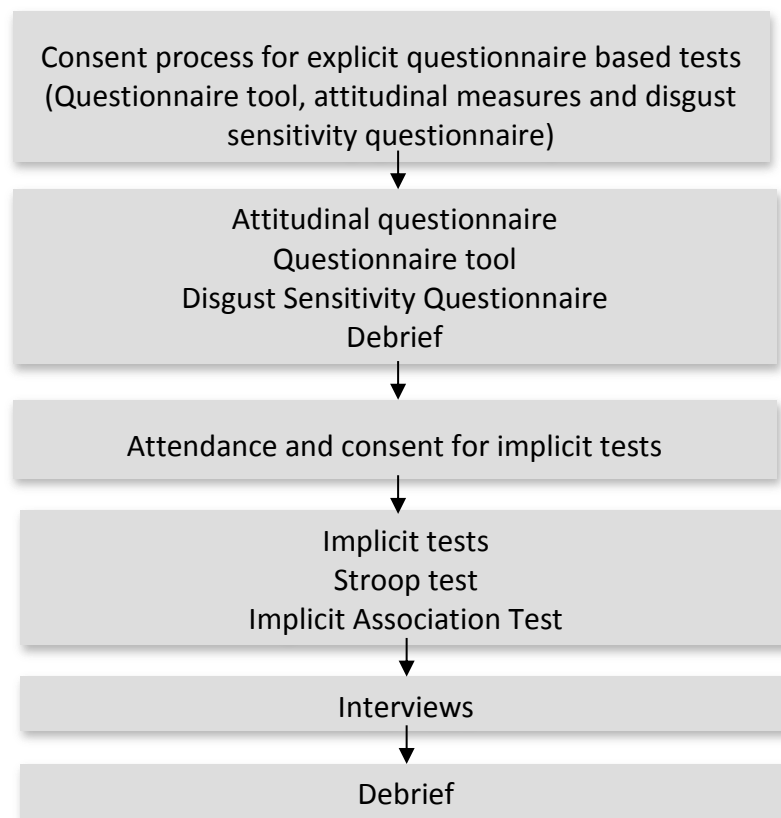
It describes methods and results for the mixed methods studies in the following order commencing with questionnaire studies using a revised questionnaire for nurses' emotions towards oral care, attitudinal questionnaires for oral care and disgust sensitivity questionnaires. It then outlines studies using Stroop tests, implicit association tests (IAT) and brief interviews. This chapter then describes the analysis and findings of these studies. It concludes with a discussion of each of the mixed methods studies in this chapter, which is followed by a second stage of discussion that draws together the findings from the studies in this thesis. This leads to recommendations for further investigation and conclusions from the studies in this thesis.

### **4.2. Methods for the mixed methods studies**

Methods for the mixed methods studies were similar to the pilot studies and participants were recruited from same population of student nurses but

participants from the pilot study were ineligible to participate in the mixed methods study. The mixed methods study was conducted in two stages, outlined in Figure 4.1. The main sample completed the questionnaires and a subset of participants attended for the second stage of tests at a different point in time.

**Figure 4.1 Illustration to show the order of delivery of tests in the mixed methods study**



The study was ethically approved by the School of Psychology ethics committee and was peer-reviewed approved for recruitment in the School of Nursing. A modification to the protocol for the questionnaire to be administered via pen and paper was approved by both schools (Appendix 4.1).

### **4.3. Materials and methods for stage 1 of the mixed methods studies**

Materials for the initial study were prepared in advance of the studies. This involved revisions to the pilot questionnaire and the addition of attitude and disgust sensitivity questionnaire studies. Methods and results for the mixed methods studies will be presented as subchapters. The preparation of data, data linking, analyses and results from the questionnaire studies are presented at the end of the methods for the questionnaire study. Preparation of data, data linking, analyses and results across the explicit and implicit studies for this will be presented after the subchapters outlining the individual studies.

#### **4.3.1. Methods for the mixed methods questionnaire studies**

The population for the mixed methods questionnaire studies were recruited through the School of Nursing adult branch (150 students in each of the 3 years of study, this excluded midwives and paediatric nurses). School noticeboards, the electronic blackboard and announcements in lectures were used. Adult branch students who had not participated in the previous studies were eligible to participate.

An on-line version of the questionnaire was developed and to improve participation from students on placements, pen and paper versions of the questionnaires with a matching appearance were also produced for the study (Appendix 4.2). Participants received questionnaires at the beginning of lectures and were able to complete them before or after the lectures or online. Participant information (Appendix 4.3) for both stages of the study was attached to the front of the questionnaire; participants were asked to read this information before participating. The front page of the online version of the questionnaire contained participant information. Participants were given confidential addressed envelopes for the internal post to return their questionnaires at a later date. A box was also available in each lecture for completed questionnaires. A link for the online version was included in

the participant information for those wishing to complete the questionnaire online.

Questionnaire study participants volunteered for the next stage of study using the final page of the questionnaire. Volunteers were asked to submit a contact number or email and a memorable word and year of birth as unique identifiers. Those completing the online version submitted this electronically. Those completing paper-based questionnaires were invited to complete and detach the final page of the questionnaire and submit this in confidential addressed envelope for volunteering which could be sent in the internal post or in the box in the lecture theatre. Questionnaires and volunteer responses were collected at the end of each lecture. Electronic volunteering data were collected confidentially using Survey Tracker software in a database separate from the questionnaire.

A debrief form (Appendix 4.4) was provided for participants at the end of the questionnaire. Participants who had completed the questionnaire were invited to complete an entry for the prize draw for three £50 prizes.

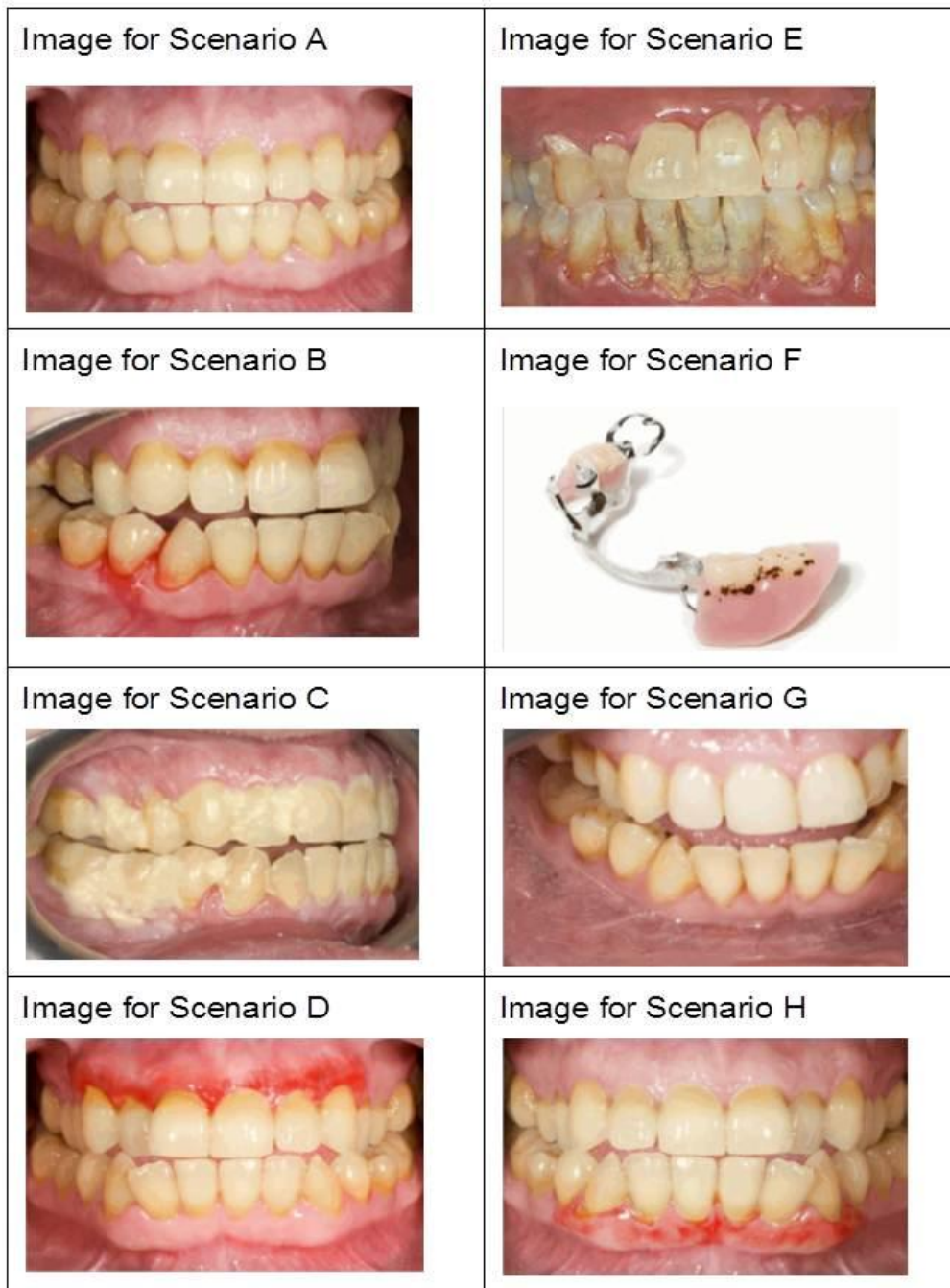
#### **4.4. Mixed methods revised questionnaire study**

Following the pilot, the pilot questionnaire was revised to improve acceptability for the mixed methods study. This involved reducing the number of items, revising questions and scales in the tool and developing the tool for online and paper delivery. This subchapter will outline methods used for the mixed methods questionnaire study, the revision of the questionnaire, analysis and results.

##### **Revision of the questionnaire based tool**

Pilot findings were used to inform the reduction of image items. Single images were selected from those evoking similar responses to eliminate the feeling of repetition. Images associated with variable responses, for example, heavily restored teeth were excluded. The final images are shown in Figure 4.2.

**Figure 4.2 Images for the questionnaire tool in the revised mixed methods questionnaire**



Further to the pilot questionnaire study findings, the revised questionnaire questions and question order were modified to improve clarity. For example, questions about cleaning the mouth were moved together, as two pilot participants felt this made questions clearer. Terms were modified to clarify



procedures, for example, using the term on a stick was added to pink swab. Avoiding care was added to the list of behaviours, as this was raised in the pilot interviews. Questions asking participants how they would feel about touching the mouth was retained however, “this mouth” was added to the question at the request of the ethics committee. The upper end of the emotional response scale was modified from “very” to “extremely” because, in the interviews, “very” was not considered sufficiently unpleasant. An additional scenario was added because nurses’ reported that with a more resistant or less dependent patient, they may alter the oral care provided. A dementia patient scenario was selected from previous study data as shown below in Figure 4.3.

**Figure 4.3 Additional scenario for the revised mixed methods questionnaire**

Scenarios
Imagine that the pictures below are from a patient who has dementia and has had a stroke. This patient is very forgetful and can be resistant to care. Currently, they have regained some function in their dominant arm. The patient is under your care at work, imagine this patient as vividly as you can.

### **Questionnaire data preparation**

Data preparation and checks followed procedures used in the pilot study but procedures were adapted for paper questionnaires and the additional methods.

A research assistant manually entered questionnaire data into survey tracker software.

Questionnaire data were then exported to Microsoft Excel 2007 (Microsoft, Redmond, United States of America), and SPSS version 18 software (IBM Inc, New York, United States of America). The researcher then manually compared the electronic dataset and paper questionnaires to confirm accuracy.

Additional data preparation was undertaken for questionnaire variables in SPSS. Behavioural frequency variables were reduced to four categories: Not providing oral care, occasional or infrequent use of oral care, once per

day and twice or more per day. A two-category variable was also produced for providing oral care once per day or more or not. Summative variables for the same questions (e.g. as a patient I would feel) across scenarios were produced by data addition in SPSS in order to conduct analyses for trends in emotion across the scenarios. Missing data analysis checks and interview data preparation followed pilot procedures.

Initial analyses were undertaken to explore emotional and behavioural responses to the care scenarios using SPSS to produce frequency tables and plots. Questionnaire analysis followed procedures used in the pilot study and Pearson's moment correlations were used to test relationships between emotion variables. Mann Whitney U tests and Kendals Tau were used for behavioural intention data. In addition, principal component analysis was conducted to examine the relationships between questionnaire variables. Aggregate emotion and behaviour variables were first examined using criteria for factorability. Tests for correlation, Bartlett's test and the Kaiser-Meyer-Olkin measure of sampling adequacy were undertaken in SPSS and communalities between variables were checked. Principal component analysis was then undertaken using varimax rotations in SPSS. A summary of analyses and results is given at the end of the methods and results of this chapter.

#### **4.4.1. Results of the questionnaire study**

##### **Profile of the population**

A total of 248 participants completed the questionnaire study. Participants were predominantly female (Table 4.1), reflecting the intake of students on the adult nursing course.

**Table 4.1 Baseline characteristics of participants in the mixed methods pilot**

	Characteristics of Participants		
	No	Mean (SD) or %	Range
Age	246 *	25.5 (7.4)	37
Gender	248		
Male	23	9.3%	
Female	225	90.7%	
Year of Study	247**		
Year 1	6	2.45%	
Year 2	141	56.9%	
Year 3	100	40.3%	
*2 missing with no age recorded			
** 1 missing with no year of study recorded			

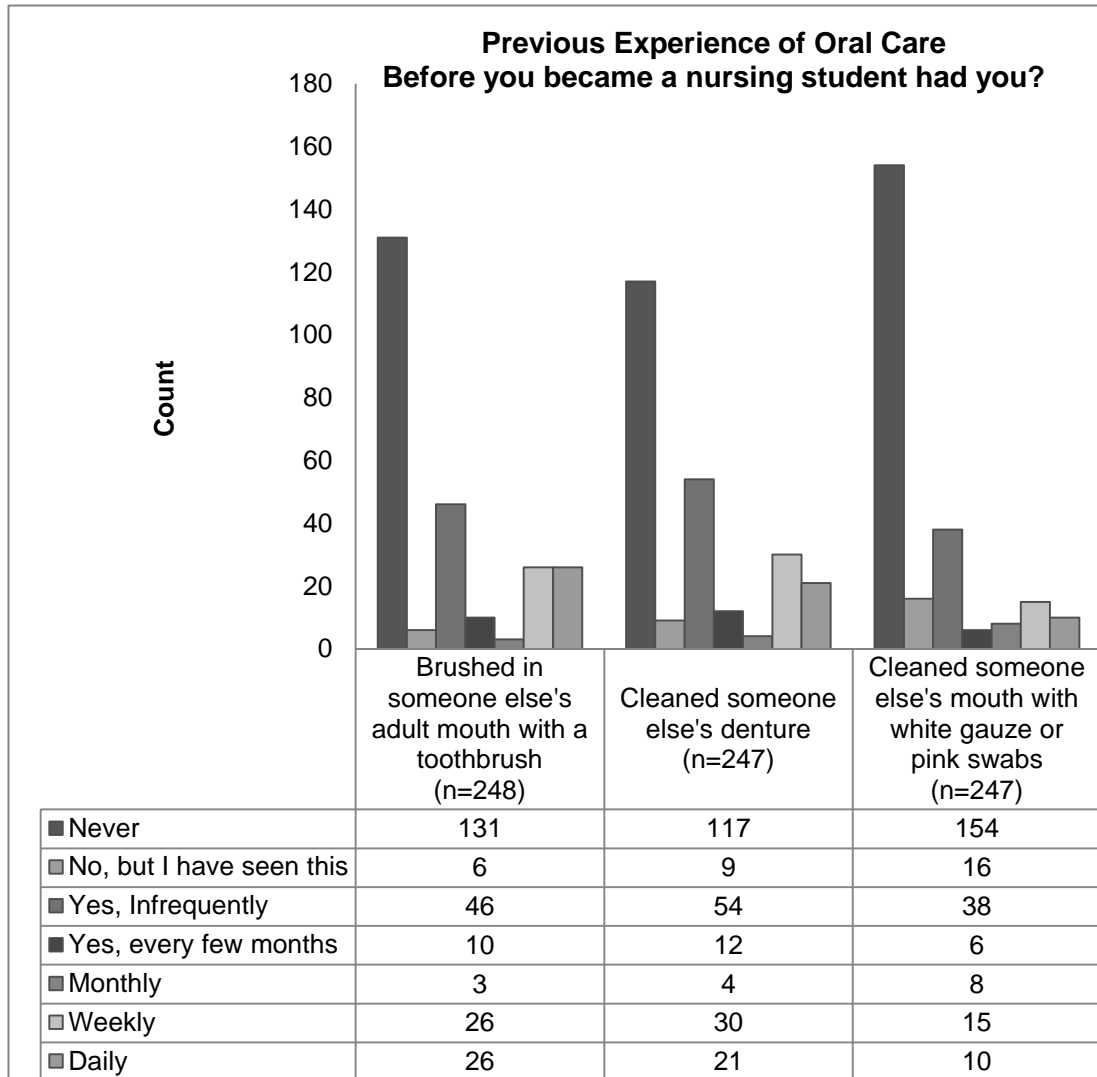
Participants were from all three years of study but only 6 first year students participated. Participants were predominantly from years two and three, with 141 (56.9%) and 100 (40.3%) participating from each year respectively. One participant did not state a year group.

#### **4.4.2. Questionnaire responses**

##### **Oral care experience**

Previous experience of oral care varied and the majority of participants reported that they had seen tooth brushing, denture cleaning and cleansing of the mouth with swabs as a student. Most reported providing irregular oral care; this is illustrated in Figure 4.4.

**Figure 4.4 Barchart showing count of previous experiences of oral care in the mixed methods study questionnaire**



Chi-square test of independence showed that previous experiences of brushing were significantly associated. For example, toothbrushing was associated with denture cleaning  $\chi^2 (9, n = 247) = 328.73, p < 0.001$  and cleaning with swabs  $\chi^2 (9, n = 247) = 176.075, p < 0.001$ . Current experiences were also associated and brushing was significantly associated with current denture  $\chi^2 (9, n = 247) = 191.557, p < 0.001$  cleaning and mouth care with swabs  $\chi^2 (9, n = 247) = 108.470, p < 0.001$  cleaning. Previous oral care experiences were not associated with current oral care practice.

### **Physical emotions towards scenarios-anxiety and disgust touching the mixed methods questionnaire scenarios**

Anxiety rating scores across all participants varied between the different scenarios (Table 4.2). Participants expressed the greatest anxiety towards touching the most unpleasant scenario (scenario E) and were least anxious touching scenarios A, F and G.

Most participants reported disgust towards touching the patient in one or more scenarios (Table 4.2). Four (1.6%) reported levels on the highest two points on the scale in relation to the normal mouth in scenario A, whilst 166 (68.9%) of participants reported being not disgusted by scenario A. Participants most commonly reported being very disgusted by scenario E (n= 75).

**Table 4.2 Questionnaire responses of anxiety and disgust towards touching the mouth in the mixed methods study**

How would you feel touching this mouth? Participant ratings of emotion:											
Scenario	Not anxious								Extremely Anxious		Total
	1		2		3		4		5		
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	
A	64.5	156	16.5	40	14.5	35	4.1	10	0.4	1	242
B	22.9	56	20.0	49	22.4	55	24.5	60	10.2	25	245
C	20.6	51	15.0	37	18.2	45	24.7	61	21.5	53	247
D	28.4	69	18.9	46	17.3	42	23.0	56	12.3	30	243
E	11.5	28	7.8	19	12.3	30	20.9	51	47.5	116	244
F	54.3	134	12.1	30	19.4	48	8.9	22	5.3	13	247
G	47.7	116	21.0	51	16.0	39	11.9	29	3.3	8	243
Scenario	Not disgusted								Extremely disgusted		Total
	1		2		3		4		5		
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	
A	68.9	166	18.7	45	10.8	26	1.2	3	0.4	1	241
B	43.2	104	27.0	65	19.5	47	7.5	18	2.9	7	241
C	26.7	65	16.0	39	19.3	47	25.5	62	12.3	30	243
D	41.5	100	27.0	65	16.6	40	12.0	29	2.9	7	241
E	19.4	47	12.0	29	15.7	38	21.9	53	31.0	75	242
F	55.1	135	18.0	44	20.4	50	4.5	11	2.0	5	245
G	56.8	138	23.5	57	16.0	39	2.9	7	0.8	2	243
H	40.4	99	23.7	58	19.6	48	12.2	30	4.1	10	245

**Physical emotions towards scenarios-relationship between physical anxiety and disgust towards touching scenarios in the mixed methods questionnaire**

There was a marked to highly significant degree of correlation between disgust and anxiety for each scenario. For example, for anxiety and disgust touching scenario A,  $r=0.690$  ( $p=0.000$ ). Anxiety ratings for scenarios that were similarly unpleasant showed marked correlation, for example, anxiety

towards touching scenario C was correlated with scenario D ,  $r= 0.656$  ( $p=0.000$ ).

Aggregate anxiety and disgust touching scores (Table 4.3) were significantly correlated (Pearson correlation=  $0.804$ ,  $p=0.001$ ) as illustrated in Appendix 4.5. Analyses conducted with and without replacement of the missing values using multiple imputations showed no effect on the results.

**Table 4.3 Pearson correlations for aggregate scores for emotion in the mixed methods questionnaire study**

		Anxious Touching	Disgust Touching	Anxious if I did not clean	Disgust if I did not clean	Dissatisfied if I did not clean	Anxious if this was my own mouth	Disgust if this was my own mouth	Anxious whilst brushing	Disgust whilst brushing	Dissatisfied whilst brushing
Disgust Touching	Pearson Correlation	0.804**									
	Sig. (2-tailed)	0.000									
	N	218									
Anxious if I did not clean	Pearson Correlation	0.009	-0.110								
	Sig. (2-tailed)	0.890	0.104								
	N	228	218								
Disgust if I did not clean	Pearson Correlation	-0.051	-0.067	0.765**							
	Sig. (2-tailed)	0.453	0.335	0.000				0.			
	N	217	209	220							
Dissatisfied if I did not clean	Pearson Correlation	-0.132	-0.220**	0.729**	0.754**						
	Sig. (2-tailed)	0.051	0.001	0.000	0.000						
	N	218	213	220	214						
Anxious if this was my own mouth	Pearson Correlation	0.165*	0.099	0.304**	0.320**	0.294**					
	Sig. (2-tailed)	0.013	0.149	0.000	0.000	0.000					
	N	224	212	226	216	215					
Disgust if this was my own mouth	Pearson Correlation	0.136*	0.165*	0.188**	0.327**	0.261**	0.830**				
	Sig. (2-tailed)	0.045	0.016	0.005	0.000	0.000	0.000				
	N	217	212	219	210	215	217				
Anxious whilst brushing	Pearson Correlation	0.883**	0.713**	-0.018	-0.081	-0.141*	0.158*	0.156*			
	Sig. (2-tailed)	0.000	0.000	0.788	0.240	0.038	0.020	0.022			
	N	224	215	224	212	216	218	215			
Disgust whilst brushing	Pearson Correlation	0.775**	0.930**	-0.146*	-0.151*	-0.288**	0.104	0.155*	0.760**		
	Sig. (2-tailed)	0.000	0.000	0.030	0.029	0.000	0.128	0.024	0.000		
	N	218	210	220	208	211	214	211	223		
Dissatisfied whilst brushing	Pearson Correlation	0.048	0.032	0.144*	0.027	0.184**	0.032	-0.102	-0.030	-0.040	
	Sig. (2-tailed)	0.481	0.648	0.033	0.701	0.008	0.647	0.142	0.657	0.552	
	N	215	207	218	207	209	212	209	219	218	221

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).



**Physical emotions towards scenarios -anxiety and disgust towards providing toothbrushing in the mixed methods questionnaire**

Two thirds of participants (66%, n=161/248) rated anxiety towards providing toothbrushing a mouth with a normal appearance (scenario A) on the lowest two points of the scale. Few participants were extremely anxious towards providing oral care in scenarios B, F and G (13%, n=33, 5.3%, n=13 and 4.1%, n=10 respectively) towards brushing the teeth. Approximately half of all participants (47.6%, n=117) felt extremely anxious and a quarter of all participants felt extremely disgusted towards brushing the teeth in scenario E (Table 4.4).

**Table 4.4 Anxiety and disgust ratings towards brushing for each scenario in the mixed methods questionnaire study**

Scenario	How would you feel while brushing this mouth? Participant ratings of emotion:										
	Not anxious								Extremely anxious		Total
	1		2		3		4		5		
%	n	%	n	%	n	%	n	%	n	n	
A	43.0	105	23.0	56	19.3	47	13.5	33	1.2	3	244
B	23.4	57	9.8	24	23.4	57	29.9	73	13.5	33	244
C	18.9	46	7.8	19	17.3	42	28.8	70	27.2	66	243
D	21.3	52	11.5	28	18.0	44	30.3	74	18.9	46	244
E	9.3	23	4.9	12	13.0	32	25.2	62	47.6	117	246
F	46.9	114	18.9	46	18.5	45	10.3	25	5.3	13	243
G	36.9	90	19.7	48	23.0	56	16.4	40	4.1	10	244
H	22.5	55	15.6	38	23.4	57	24.6	60	13.9	34	244

**Table 4.4 anxiety and disgust towards brushing for each scenario in the mixed methods questionnaire study continued**

Scenario	How would you feel while brushing this mouth? Participant ratings of emotion:										
	Not disgusted								Extremely disgusted		Total
	1		2		3		4		5		n
	%	n	%	n	%	n	%	n	%	n	n
A	59.0	141	20.1	48	16.3	39	4.2	10	0.4	1	239
B	40.7	98	22.0	53	23.2	56	10.8	26	3.3	8	241
C	29.0	69	15.1	36	19.3	46	23.9	57	12.6	30	238
D	38.8	93	21.7	52	21.3	51	12.9	31	5.4	13	240
E	20.2	49	12.3	30	16.9	41	25.5	62	25.1	61	243
F	48.8	118	21.1	51	19.4	47	8.7	21	2.1	5	242
G	47.5	116	21.7	53	23.8	58	5.7	14	1.2	3	244
H	40.3	98	18.1	44	25.5	62	11.9	29	4.1	10	243

**Physical emotions towards scenarios-satisfaction brushing the teeth in scenarios in the mixed methods questionnaire**

The majority of participants reported satisfaction from brushing teeth with fewer than 10% reporting that brushing teeth was not satisfying. Participants most frequently reported being extremely satisfied brushing the teeth in scenarios C, E, F and G. Ratings for satisfaction are illustrated further in Appendix 4.6.

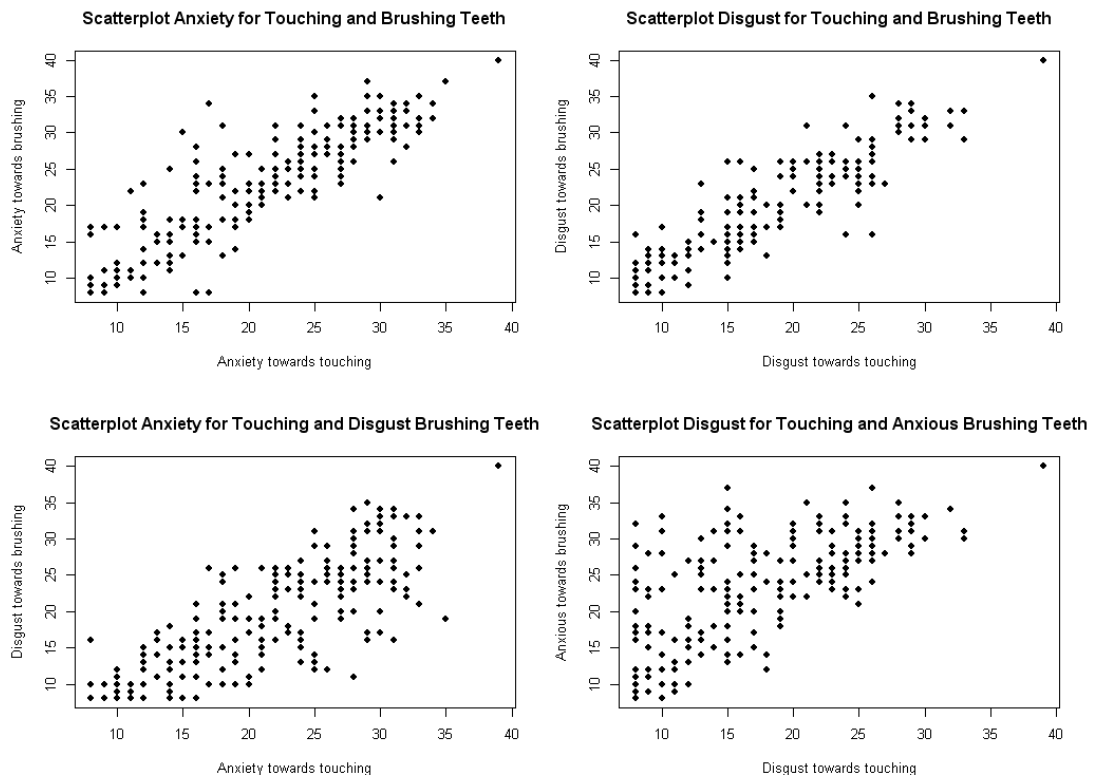
**Physical emotions towards scenarios-relationship between anxiety, disgust and satisfaction towards brushing in scenarios in the mixed methods questionnaire**

Aggregated scores emotions of anxiety and disgust towards brushing (the sum of anxiety scores for all scenarios and the sum of disgust scores respectively) were highly correlated ( $r=0.824$ ,  $p=0.001$ ) (Table 4.3).

Aggregate scores for satisfaction from brushing the teeth (sum of scores in all scenarios) was not associated with anxiety or disgust towards touching or brushing the teeth Across the sample, emotional disgust ratings were lower than ratings of anxiety.

Emotions of anxiety towards touching were highly correlated with anxiety towards brushing ( $r=0.824$ ,  $p=0.001$ ). Disgust towards touching was highly correlated with disgust towards brushing ( $r=0.924$ ,  $p=0.001$ ) (Figure 4.5).

**Figure 4.5 Scatterplots showing the relationship between anxiety and disgust touching and brushing teeth across scenarios in the mixed methods questionnaire**



**Moral emotions towards scenarios-disgust, anxiety and dissatisfaction towards not cleaning the mouth in scenarios in the mixed methods questionnaire**

Most participants reported anxiety, disgust and dissatisfaction towards not cleaning the patient’s mouth in scenarios. A few expressed no anxiety, these ranged from 0.8% ( $n=2$ ) of participants in scenario C to 2.9% ( $n=7$ ) in scenario F. The proportion of participants in each scenario who did not feel disgusted if they did not provide oral care ranged from 5.4% ( $n=13$ ) in scenario G to 2.1% ( $n=5$ ) for scenario C.

The majority of participants rated anxiety towards not cleaning a patient's mouth in the upper (most anxious) two points of the anxiety scale for most scenarios. Moral anxiety and physical disgust towards not cleaning was greatest for scenario E with 79% (n=191) and 74.8% (n=181) of participants reporting emotions scores at the top of the scale. Feeling extremely disgusted towards not cleaning was reported least often for the two cleanest scenarios, A and G with (26.1% n=61) of participants and 34.3% (n=83) of participants reporting extreme disgust respectively (Table 4.5). The majority of participants rated their dissatisfaction towards not cleaning in the upper 2 scale points. Less than 2% (n=4) of participants expressed no dissatisfaction towards not cleaning.

**Table 4.5 Anxiety and disgust ratings towards not brushing the teeth for each scenario in the mixed methods questionnaire study**

Scenario	Participant ratings of emotion: How would you feel if you did not clean this mouth?										
	Not anxious								Extremely anxious		Total responses
	1	2	3	4	5	n	%	n	%	n	n
A	2.5	6	5.4	13	18.3	44	45.0	108	28.8	69	240
B	1.2	3	0.8	2	8.2	20	38.8	95	51.0	125	245
C	0.8	2	0.4	1	5.7	14	22.0	54	71.0	174	245
D	1.6	4	2.9	7	10.7	26	36.2	88	48.6	118	243
E	2.5	6	0.4	1	3.7	9	14.8	36	78.6	191	243
F	2.9	7	3.7	9	14.8	36	38.5	94	40.2	98	244
G	2.5	6	7.9	19	21.1	51	32.6	79	36.0	87	242
H	1.6	4	2.9	7	11.5	28	36.5	89	47.5	116	244

**Table 4.5 Anxiety and disgust ratings towards not brushing the teeth for each scenario in the mixed methods questionnaire study continued**

Scenario	Participant ratings of emotion: How would you feel if you did not clean this mouth?										
	Not disgusted								Extremely disgusted		Total responses n
	1	2	3	4	5						
%	n	%	n	%	n	%	n	%	n	n	
A	4.3	10	4.7	11	23.5	55	41.5	97	26.1	61	234
B	4.1	10	2.9	7	14.0	34	32.6	79	46.3	112	242
C	2.1	5	1.2	3	8.3	20	22.7	55	65.7	159	242
D	3.7	9	5.8	14	15.4	37	30.7	74	44.4	107	241
E	2.5	6	1.7	4	6.6	16	14.5	35	74.8	181	242
F	4.1	10	4.1	10	18.1	44	32.1	78	41.6	101	243
G	5.4	13	11.6	28	20.2	49	28.5	69	34.3	83	242
H	2.1	5	4.9	12	18.1	44	30.5	74	44.4	108	243

**Moral emotions towards scenarios-relationship between anxiety, disgust and dissatisfaction towards not providing oral care in scenarios in the mixed methods questionnaire**

Aggregate scores for anxiety and disgust towards not providing oral care were markedly correlated ( $r=0.765$ ,  $n=22$ ,  $p>0.001$ ). There was also a marked degree of correlation between anxiety towards not providing oral care and dissatisfaction from not providing care ( $r=0.729$ ,  $n=22$ ,  $p>0.001$ ) (Table 4.3).

**Empathetic emotions towards scenarios-empathetic anxiety and disgust in scenarios in the mixed methods questionnaire**

All participants expressed empathetic anxiety and disgust (imagining being the patient in the scenario) but valence ratings varied between scenarios. Participants rated anxiety in the two highest scale points in all of the scenarios with the exception of scenario G (Table 4.6).

The majority of participants reported being highly anxious and disgusted as the patient in scenario E with 91.4% ( $n=223$ ) and 88.2% ( $n=216$ ) rating their

reaction in the upper extreme respectively (14.10). Emotional disgust towards being the patient in scenario C was similarly high, with 82.7 (n=201) participants rating their emotions as extremely disgusted (Table 4.6).

**Table 4.6 Ratings of empathetic emotional anxiety and disgust towards scenarios in the mixed methods questionnaire study**

		Participant ratings of emotion: How would you feel if this was your mouth?									
Scenario	Not anxious 1		2		3		4		Extremely anxious 5		Total  n
	%	n	%	n	%	n	%	n	%	n	
A	9.2	22	8.8	21	12.1	29	28.3	68	41.7	100	240
B	1.2	3	1.6	4	7.0	17	27.2	66	63.0	153	243
C	0.8	2	0.8	2	2.0	5	12.6	31	83.7	206	246
D	0.8	2	5.3	13	7.8	19	25.0	61	61.1	149	244
E	0.0	0	0.4	1	1.6	4	6.6	16	91.4	223	244
F	2.9	7	4.9	12	17.6	43	30.3	74	44.3	108	244
G	11.9	29	16.0	39	23.8	58	25.8	63	22.5	55	244
H	2.9	7	2.4	6	9.8	24	35.9	88	49.0	120	245
Scenario	Not disgusted 1		2		3		4		Extremely disgusted 5		Total  n
	%	n	%	n	%	n	%	n	%	n	
A	9.2	22	9.6	23	16.3	39	28.3	68	36.7	88	240
B	3.3	8	5.0	12	13.4	32	29.3	70	49.0	117	239
C	1.2	3	2.5	6	1.6	4	11.9	29	82.7	201	243
D	2.9	7	8.7	21	13.6	33	22.3	54	52.5	127	242
E	1.2	3	0.4	1	2.9	7	7.3	18	88.2	216	245
F	4.5	11	5.3	13	21.6	53	26.9	66	41.6	102	245
G	16.0	39	14.3	35	29.1	71	20.5	50	20.1	49	244
H	4.5	11	4.1	10	15.9	39	31.8	78	43.7	107	245

**Moral emotions towards scenarios-correlations between empathetic disgust and anxiety in each scenario in the mixed methods questionnaire**

Empathetic disgust and anxiety responses for each scenario were highly correlated. For example, in scenario A, anxiety and disgust were correlated ( $r=0.865$   $p=0.001$ ). Empathetic emotional responses were moderately correlated between scenarios with the exception of scenario E. Anxiety towards scenario A was moderately correlated with anxiety and disgust towards scenarios B and D. Empathetic emotions towards scenario E were not correlated with scenario A.

**4.4.3. Behavioural intention to provide oral care in scenarios in the mixed methods questionnaire**

All participants intended to provide one or more daily oral care activities in at least one of the scenarios as shown in Table 4.7.

**Table 4.7 Behavioural intention to provide oral care-intention to provide daily oral care in scenarios in the mixed methods questionnaire study**

Scenario	Count and percentage of participants intending to:			
	Provide no daily oral care n=241	Brush once or more per day n=240	Use a pink swab once or more per day n=174	Use a white swab once per day or more n=163
<b>a</b>	16 (7%)	223 (93%)	74 (43%)	51 (31%)
<b>b</b>	18 (7%)	195 (81%)	107 (61%)	100 (61%)
<b>c</b>	17 (7%)	211 (88%)	127 (73%)	107 (66%)
<b>d</b>	23 (10%)	199 (83%)	110 (63%)	95 (58%)
<b>e</b>	18 (7%)	192 (80%)	144 (83%)	131 (80%)
<b>f</b>	21 (9%)	223 (93%)		
<b>g</b>	23 (10%)	225 (94%)	53 (30%)	55 (34%)
<b>h</b>	21 (9%)	210 (88%)	88 (51%)	80 (49%)

The majority of participants intended to provide toothbrushing at least once per day for each scenario. Seven indicated that they would not brush daily in

any of the scenarios. In scenarios A, C, E, G and H, over 60% of participants stated an intention to provide toothbrushing twice per day.

Two participants (0.6%) did not intend to provide toothbrushing care in scenario G and four stated that they would never brush in the mouth for scenario A. Less than 20% of all participants reported an intention to provide occasional care or no oral care in the remaining scenarios.

Between 64-87% of participants reported intending to clean the mouth with a pink swab (from n=153 in scenario G to n= 210 in scenario E). They most frequently reported an intention to use pink swabs regularly (at least once per day) in the most unpleasant scenarios E and C (59.5 % n=144 and 52.1% n=127 respectively). Participants were least likely to clean the mouth with a pink swab on a stick in the cleanest scenarios, A and G as illustrated in Appendix 4.7.

The intended use of flat white swabs varied according to each scenario. Between 20 and 30% of had no intention to use flat white swabs in scenarios B, C, D and E.

### **Behavioural intention to provide oral care –behavioural avoidance in scenarios in the mixed methods questionnaire**

The majority of participants intended to be very gentle or avoid areas during the provision of oral care and most often reported needing to be gentle or avoiding areas in the most unpleasant scenario E (Table 4.8). Few participants reported that they could provide care without being very gentle or avoiding areas in scenarios A, B, and C respectively (2%, n=5, 1.2%, n=3, and 2.9%, n=7).

Two participants (0.8%) felt that it was not necessary to be very gentle or avoid areas during the provision of oral care. Participants were most frequently happy to provide oral care without being gentle in scenario G (7.8% n=19).



**Table 4.8 Behavioural intention to provide oral care-behavioural avoidance for each scenario in the mixed methods questionnaire study**

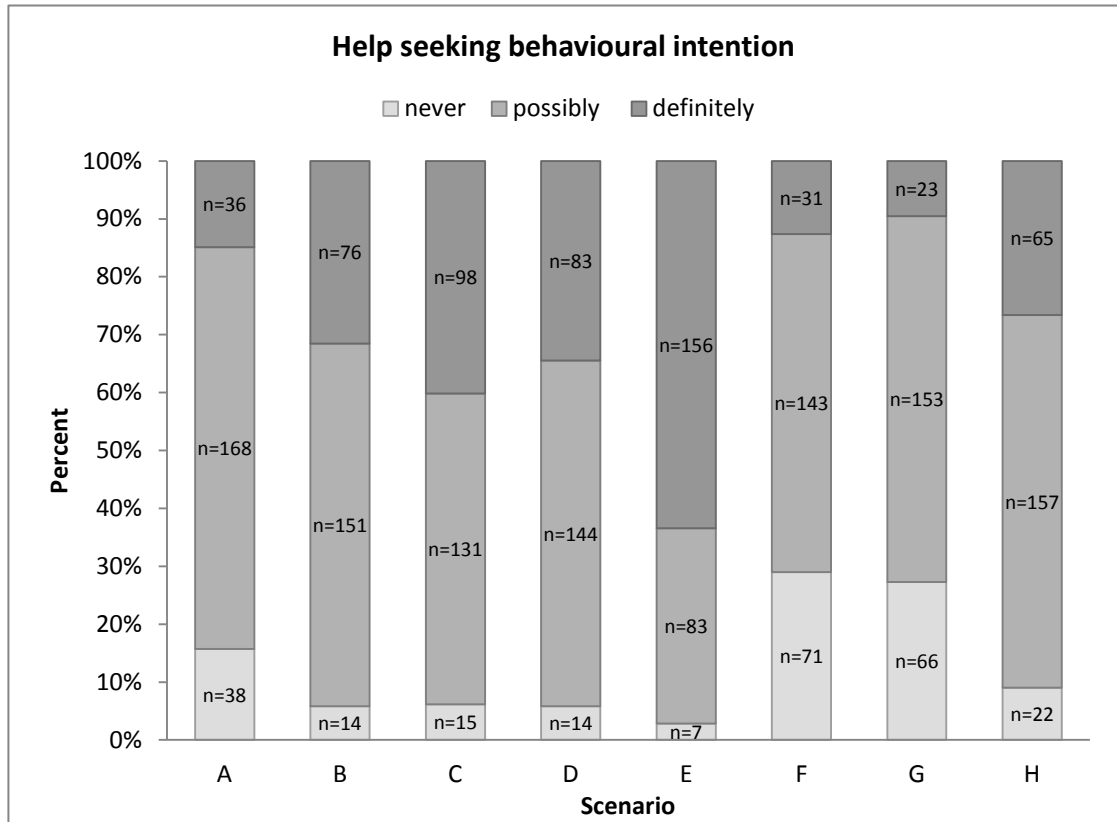
Scenario	Behavioural Intention						
	To be extra gentle or avoid areas						
	never		possibly		definitely		total
%	<i>n</i>	%	<i>n</i>	%	<i>n</i>		
A	2.0	5	41.0	100	57.0	139	244
B	1.2	3	13.1	32	85.7	210	245
C	2.9	7	29.1	71	68.0	166	244
D	0.8	2	21.8	53	77.4	188	243
E	0.8	2	15.1	37	84.1	206	245
G	7.8	19	55.7	136	36.5	89	244
H	0.8	2	25.4	62	73.8	180	244

**Behavioural intention to provide oral care-help seeking behavioural intention in scenarios in the mixed methods questionnaire**

Participants reported needing to seek help with over 60% participants stating that they would definitely ask for help in dealing with scenario E. Between 10 and 40 percent of participants said that they would definitely ask for help in the remaining scenarios.

Participants were most likely to ask for help in unpleasant scenarios, B, C, D, E and H, with less than 10% of participants stating that they would never ask for help with oral care in these circumstances. Participants were least likely to ask for help in scenarios F, G and A (Figure 4.6).

**Figure 4.6 Barchart showing proportion of help seeking intentions for each scenario in the mixed methods questionnaire study**



**Behavioural intention to provide oral care-correlations between behavioural intentions in each scenario in the mixed methods questionnaire study**

Intention to provide toothbrushing care was not associated with the intention to use swabs for oral care. The intention to provide an oral care activity in one scenario was correlated with an intention to provide the same activity in other scenario. This association was greatest between scenarios, which were similar. For example, an intention to provide toothbrushing in scenario B was moderately correlated with an intention to provide brushing in scenario H ( $\tau=0.530$ ,  $n=243$ ,  $p<0.001$ ).

In each of the scenarios, cleaning in the mouth with white swabs and cleaning in the mouth with pink swabs were moderately correlated (for example, scenario A,  $\tau= 5.49$   $n= 240$ ,  $p<0.001$ , scenario E,  $\tau=5.93$ ,  $n=240$ ,  $p<0.001$ ). A significant but weak association was also observed

between the use of swabs, intended behavioural avoidance and help seeking (as illustrated for scenarios A and D, Appendix 4.8 and 4.9).

Kendal's Tau correlations showed a significant but weak negative association between intention to provide brushing and asking for help for scenarios B,C,D and E (scenario B, tau= -0.114 n= 237,. p<0.001, scenario C, tau= -0.158 n= 241, p<0.05, scenario D, tau= -0.220 n= 239, p<0.001, scenario E, tau= -0.136 n= 242, p<0.05). There was also a weak negative association between avoiding areas/being gentle and intended brushing behaviours in the different scenarios (Table 4.9).

**Table 4.9 Behavioural intention to provide oral care-correlations for the frequency of intended oral care for oral care behaviours across all scenarios in the mixed methods questionnaire study**

	Score for the frequency of daily oral care procedures for all scenarios						Score for other intended oral care behaviours across all scenarios			
	Brushing teeth tau	n	Pink swab tau	n	White swab tau	n	Ask for help tau	n	Avoid areas/ be especially gentle tau	n
Brushing teeth tau	1	226	0.005	223	0.096	217	-0.052	210	-0.066	217
Pink swab tau	0.005	223	1	231	0.639**	220	0.097	214	0.136**	223
White swab tau	0.096	217	0.639**	220	1	222	0.125*	205	0.138**	213
Ask for help tau	-0.052	210	0.097	214	.125*	205	1	220	0.233**	218
Avoid areas or be especially gentle whilst cleaning tau	-0.066	217	0.136**	223	0.138**	213	0.233**	218	1	229
** Correlation is significant at the 0.01 level (2-tailed)										
* Correlation is significant at the 0.05 level (2-tailed)										

#### 4.4.4. Relationship between self-reported emotions and intended behaviour in scenarios in the mixed methods questionnaire

No relationship was seen between expressed emotions and the intention to provide toothbrushing or frequency of toothbrushing.

Mann Whitney-U tests showed intentions to definitely seek help in scenarios A, B, C, E and F were significantly associated with greater disgust touching across all scenarios (U=3500.0, p=0.018, U=6599.0, p=0.00, U=7792.0, p=0.023 U=6736.0, p=0.020 U=3432, p=0.24).

Participants with greater total scores for anxiety brushing were significantly more likely to definitely seek help in scenarios B, C, D, E and F respectively. In addition, individuals seeking help in scenarios B,C,E,F and H showed significantly greater total disgust brushing. Individuals who indicated that they would definitely be gentle or avoid areas in the clean mouth of scenario A expressed significantly more disgust if they did not clean, U=6728.0, p=0.038. They also expressed significantly greater anxiety and disgust if this was their own mouth U=7684.0, p=0.002 and U= p=0.023. Definitely being gentle or avoiding areas was not significantly related to other expressed emotions towards oral care.

No significant correlations were seen between the aggregated scores across all scenarios for the intention to provide oral care and emotion across all scenarios.

#### **4.4.5. Principal component analysis of aggregate scores for emotions and behavioural intentions scenarios in the mixed methods questionnaire**

Tests to confirm that data were suitable for principle component analysis confirmed that all 15 emotion items were correlated with at least one other item. Cronbach's alpha showed internal consistency was high at above 8 for the summative variables. Bartlett's test of sphericity was significant ( $\chi^2$  (105) = 1484.78, p <0.001). The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.657, which was above the recommended value of 0.6. Communalities were above 0.5 confirming items shared some common variance with other items, therefore meeting requirements for principal component analysis.

Initial Eigenvalues from the principal component analysis showed that the first factor explained 25% of the variance (Table 4.10). The second, third, fourth and fifth factors explained 21%, 12%, 10% and 8% of the variance respectively. The sixth and seventh factors explained 7% and 5% of the variance and the remaining seven factors together explained the remaining 9% of the variance. Varimax rotations of the factor loading matrix were undertaken. A five-factor solution, which explained 76% of the variance, was selected. Eigenvalues and the principal component matrix are shown in the Table 4.10 and illustrated in a Scree plot (Appendix 4.10).

**Table 4.10 Principal Component Analysis eigenvalues for the mixed methods questionnaire study aggregate variables**

		Principal component number													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Initial Eigenvalues	Eigenvalue	3.552	2.978	1.726	1.376	1.07	0.911	0.84	0.373	0.318	0.268	0.209	0.168	0.138	0.071
	% of Variance	25.372	21.272	12.331	9.831	7.646	6.506	5.998	2.664	2.274	1.914	1.496	1.202	0.986	0.508
	Cumulative %	25.372	46.644	58.975	68.81	76.452	82.958	88.956	91.62	93.894	95.808	97.304	98.506	99.492	100
Aggregate emotion scores	Anxious touching this mouth	0.901	0.135	-0.034	0.181	0.076									
	Disgust touching this mouth	0.883	0.061	-0.011	0.172	-0.035									
	Anxious if I did not clean this mouth	-0.197	0.798	0.004	0.318	0.09									
	Disgust if I did not clean this mouth	-0.215	0.817	-0.079	0.232	-0.043									
	Avoid or gentle	0.03	0.102	0.143	0.387	0.637									
	Dissatisfied if I did not clean this mouth	-0.332	0.764	-0.07	0.264	0.074									
	Anxious if your own mouth	0.165	0.645	-0.38	-0.502	0.014									
	Disgust if your own mouth	0.193	0.598	-0.395	-0.49	-0.208									
	Anxious while brushing	0.892	0.119	-0.021	0.098	0.068									
	Disgust while brushing	0.936	0.031	-0.002	0.086	-0.02									
	Satisfied while brushing	-0.037	0.143	0.171	0.302	0.656									

**Table 4.10 Principal component analysis eigenvalues for the mixed methods questionnaire study aggregate variables continued**

		Principal component number				
		1	2	3	4	5
Initial Eigenvalues	Eigenvalue	3.552	2.978	1.726	1.376	1.07
	% of Variance	25.372	21.272	12.33 1	9.831	7.646
	Cumulative %	25.372	46.644	58.97 5	68.81	76.452
Behavioural intention frequencies across scenarios	Brush with toothbrush times per day	-0.055	0.226	0.266	0.42	-0.372
	Clean with pink swab times per day	0.088	0.315	0.782	0.338	-0.092
	Clean with white swab times per day	0.13	0.313	0.826	0.221	-0.126

Following examination of the principal components extracted. Factor labels were produced to describe the components.

#### *Component 1*

The first principal component related to anxiety and disgust in relation to physical interaction with the mouth through touching and cleaning. This was termed “*physical disgust and anxiety*”.

#### *Component 2*

The second principal component was explained by anxieties and disgust in relation to not providing care. This also included the feelings of unpleasantness in the place of the patient. This feeling of needing to provide care, particularly in unpleasant situations was termed “*moral emotions*”.

#### *Component 3*

The third principal component was the intention to provide cleaning care with swabs. This component also included anxiety and disgust in the place of the patient, touching and providing care. This relationship between using swabs and negative emotions towards providing care was termed “*modification of oral care*”.

#### *Component 4*

The fourth principal component included the feelings in the place of the patient and brushing. This was termed "*empathetic motivation*".

#### *Component 5*

The fifth component included both satisfaction and being gentle. This was termed "*caring emotion*" because of satisfaction and being gentle were for the purposes of providing the best care.



## **4.5. Mixed methods attitude questionnaire studies**

Attitudinal questionnaires were added to the mixed methods studies in order to explore participants' attitudes towards oral care in the mixed methods studies and allow comparisons of the results with previous studies of oral care. The methods and results for this will be presented below. It was also conducted to explore the relationship between attitudes emotions and behaviours in the mixed methods studies.

### **4.5.1. Methods for the mixed methods attitudinal questionnaire study**

Methods for the consent, recruitment, and data collection followed the mixed methods questionnaire study. Attitude questionnaires were delivered alongside the mixed methods questionnaire in the order specified in section 4.2.

Questions adapted from Wardh et al. (1997) and adapted from the attitudinal component of a survey of oral care in intensive care units (Binkley et al., 2004) were used for attitudes towards oral care. Attitude questionnaire 1 and 2 are shown in Appendix 4.2 as questions 7 and 8 respectively.

### **Data preparation and analysis**

Data recording and retrieval followed methods from the mixed methods questionnaire study. Attitudinal data were analysed as ordinal variables in accordance with previous studies (Wardh et al., 1997, Binkley et al., 2004, Furr et al., 2004, Wardh et al., 2012) to examine frequencies of responses and associations between data with  $\chi^2$  tests.

### **4.5.2. Results for attitude and emotions towards oral care in the mixed methods studies-attitude measure 1**

Participants reported positive attitudes towards oral care (Table 4.11). To the question how would you describe the task of oral care, 84% (208/231) rated oral care as very much "has to be done" and 95% (236/240) reported that oral care was very good nursing. Less than 1% said that oral care was

repulsive. Half of the students reported that oral care was somewhat of a personal encroachment and 8% (19/217) reported that oral care was very much a personal encroachment.

#### **4.5.3. Results for attitude towards oral care in the mixed methods studies-attitude measure 2**

Three quarters of the participants (74.2% n=184/245) strongly agreed that oral care was a high priority (Table 4.11). Over a third of participants n=87 agreed that cleaning the mouth was an unpleasant task, of those seven strongly agreed and 71% of participants found the oral cavity difficult to clean. In total, 65% of students disagreed with the statement “patient mouths get worse no matter what I do” and 60% of participants n=158 agreed they had been given enough training in oral care. More than half of participants n=110 (57%) felt they had adequate time to provide oral care.

$\chi^2$  tests of independence to examine the relationships between attitudinal variables showed a significant association ( $\chi^2= 20.90$ ,  $P<0.000$ ) between finding cleaning the mouth unpleasant and difficulty cleaning the mouth.

**Table 4.11 Questionnaire responses to attitude measures 1 and 2 in the mixed methods studies**

Count and percentage of responses to attitude measure 1						
Question: How would you describe the task of oral care?						
	Not at all	Somewhat	Very	Missing	Total n of respondents	
Repulsive n	167	63	2	16	232	
%	67.3%	25.4%	0.8%	6.5%		
Personal Encroachment n	68	130	19	31	217	
%	27.4%	52.4%	7.7%	12.5%		
Has to be done n	8	15	208	17	231	
%	3.2%	6%	83.9%	6.9%		
Good Nursing n	1	3	236	8	240	
%	0.4%	1.2%	95.2%	3.2%		
Count and percentage of responses to attitude measure 2						
Question	Strongly Disagree	Disagree	Not agree/ disagree	Agree	Strongly Agree	Total n
Oral care is a high priority n (% of total responses)	18 7.3%	5 2.0%	4 1.6%	34 13.7%	184 74.2%	245
Cleaning the mouth is an unpleasant task (% of total responses)	33 13.3%	71 28.6%	53 21.4%	80 32.3%	7 2.8%	244
Oral cavity is difficult to clean (% of total responses)	6 2.4%	38 15.3%	26 10.5%	149 60.1%	27 10.9%	246
Patient mouths get worse no matter what I do (% of total responses)	35 14.1%	126 50.8%	70 28.2%	14 5.6%	1 0.4%	246
I have been given enough training in oral care (% of total responses)	15 6.0%	44 17.7%	39 15.7%	109 44.0%	39 15.7%	246
I have adequate time to provide oral care (% of total responses)	21 8.5%	58 23.4%	57 23.0%	92 37.1%	18 7.3%	246

## **4.6. Disgust sensitivity questionnaires (DSS) study**

The disgust sensitivity questionnaire study was conducted for the purpose of examining individual responses to general disgust items and then exploring the relationship between individual differences in general disgust and the mixed methods questionnaire oral care disgust responses.

### **4.6.1. Methods for the disgust sensitivity questionnaire study**

The disgust sensitivity questionnaire (Haidt et al., 1994) revised by Olatunji et al in 2007 (Appendix 4.11) was administered in accordance with the instructions for use measure individual differences in responses to disgust (Haidt, 2011). This was delivered with the mixed methods questionnaire study and followed the methods for the consent, recruitment, and data collection.

#### **Data preparation and analysis**

Data collection and preparation followed methods used in the mixed methods questionnaire study. In addition, disgust sensitivity scores (DSS) were calculated in SPSS in accordance with the literature (Haidt et al., 1994, Haidt, 2011) using the standard formulae (Appendix 4.11). Data were complete with the exception of one variable for one participant; this value was replaced with a median value and tested for impact on the results. Disgust sensitivity final score data were then checked using procedures outlined in Tabachnick and Fidel (2007).

### **4.6.2. Results for the mixed methods disgust sensitivity questionnaire study**

Disgust sensitivity data (DSS) were available for all participants. Disgust sensitivity data were normally distributed and mean DSS was 42%, 8% lower than the midpoint of the 0-100 scale.

## **4.7. Exploring associations between the mixed methods stage 1 findings**

Data from stage 1 were analysed in order to examine the relationships between attitudes, emotions and disgust sensitivity.

### **4.7.1. Methods for data preparation and analysis for tests to explore the relationship between attitudes, disgust sensitivity, emotions and behaviours towards oral care in the mixed methods studies**

Data from the questionnaire studies were all recorded in a SPSS spreadsheet and prepared and checked following the methods for the questionnaire study.

Pearson's product-moment correlation tests were used to explore coefficients between disgust sensitivity and the summative emotion and behaviour data. Spearman's rank correlations were used to explore associations between mixed methods questionnaire and attitude data.

### **4.7.2. Results for tests to explore the relationship between attitudes, disgust sensitivity, emotions and behaviours towards oral care in the mixed methods studies**

No associations were found between attitude variables and current oral care practices or oral care practices before starting to train as a nurse.

#### **Relationships between attitudes and emotions towards oral care in the mixed methods studies**

Correlations showing weak but significant associations were seen between disgust touching and finding 'oral care repulsive' ( $r_s=0.398$ ,  $n=207$   $p=0.00$ ). Anxiety brushing had a weak but significant association with finding 'oral care repulsive' ( $r_s=0.317$ ,  $n=239$ ,  $p=0.00$ ), finding the mouth 'difficult to clean' ( $r_s=0.261$ ,  $n=213$ ,  $p=0.00$ ) and finding that 'mouths get worse no matter what I do' ( $r_s=0.256$ ,  $n=241$   $p=0.00$ ).

**Relationship between emotions behaviour and disgust sensitivity towards oral care in the mixed methods studies**

Disgust sensitivity was moderately correlated with anxiety and disgust towards touching the mouth in the scenarios ( $r=0.422$ ,  $n=233$ ,  $p<0.001$  and  $r=0.422$ ,  $n=222$ ,  $p<0.001$  respectively) (Table 4.12). Disgust sensitivity was not correlated with behavioural intention variables.

**Table 4.12 Correlations for disgust sensitivity with emotion and behavioural intention in the mixed methods studies**

	<b>Disgust Sensitivity Pearson Correlation</b>	<b>N</b>
Anxious touching this mouth summative score for anxiety across all scenarios	0.422**	233
Disgust touching this mouth summative score for disgust across all scenarios	0.372**	222
Anxious if I did not clean this mouth summative score for anxiety across all scenarios	0.031	232
Disgust if I did not clean this mouth summative score for disgust across all scenarios	0.040	220
Dissatisfied if I did not clean this mouth summative score for dissatisfaction across all scenarios	-0.001	223
Anxious if your own mouth summative score for anxiety across all scenarios	0.162	227
Disgust if your own mouth summative score for disgust across all scenarios	0.218**	222
Anxious while brushing summative score for anxiety across all scenarios	0.385**	229
Disgust while brushing summative score for disgust across all scenarios	0.327**	223
Satisfied while brushing summative score for satisfaction across all scenarios	0.00	220
**Significant at $p=0.001$		

## **4.8. Materials and methods for the second stage of tests**

The second stage of tests was conducted to examine implicit responses to oral care stimuli and to validate explicit questionnaire content. Tests for the second stage involved interviews, Stroop tests and implicit association tests.

### **Methods Stroop tests, implicit association tests and interviews**

Participants for the second stage of tests were recruited as a subsample of the mixed methods questionnaire study population.

First stage participants were given the opportunity to attend for the second stage of tests by completing and submitting the last page of the questionnaire as previously described for the mixed methods study. Contact details supplied by volunteers were used to inform volunteers of sessions for second stage tests. Sessions were made available at dates and locations convenient to participants. Tests were conducted in conditions replicating those in the pilot study. These were delivered in order as outlined in Figure 4.1.

Participants who attended for the computer based implicit tests and interviews were given a five-pound voucher as a thank you for their time.

## **4.9. Mixed methods study interviews**

The interviews were for the purpose of further clarifying the meaning of the questionnaire content, and for validating the questions and answers.

### **Mixed methods study interview methods**

Interviews were conducted using methods used for the pilot studies. These used the revised mixed methods questionnaire. Interviews were delivered with the second stage two tests as outlined in Figure 4.1.

Interview data were analysed using pilot study interview methods.

#### **4.9.1. Mixed methods study interview results**

Each of the 41 participants who attended for the IAT and Stroop tests participated in semi structured one-to-one interviews.

Participants consistently interpreted questions, scenarios and response scales. The intensity of descriptions of self-reported disgust and anxiety during the interviews were similar to questionnaire responses.



#### **4.10. Mixed methods study Stroop test**

The Stroop test was carried out for the purpose of capturing implicit reactions to oral care stimuli in the population sample.

##### **4.10.1. Methods for the mixed methods study Stroop test**

Stroop test methods were identical to the pilot study however, no heart rate monitor was used and images of heavily restored teeth were excluded.

##### **Data preparation and analysis for the mixed methods study Stroop test**

Stroop test data were retrieved checked and analysed using the procedures from the pilot study in SPSS. Stroop data were skewed and log transformation was undertaken. Median Stroop reaction times were calculated for dirty, clean and neutral stimuli. Median differences between dirty, clean and neutral stimuli were calculated. A further dichotomous variable was produced to indicate a positive Stroop test result.

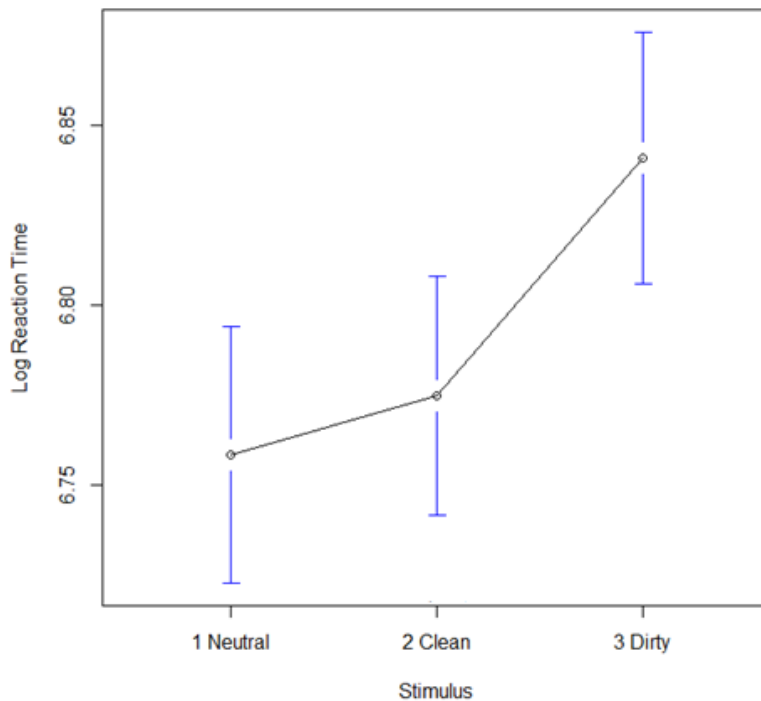
##### **4.10.2. Results for the mixed methods study Stroop test**

A sample of 41 participants from the 248 questionnaire participants attended for the Stroop test.

In total 205 practice trials, 1230 neutral practice trials and 3690 Stroop trials were conducted. Stroop test reaction times were slowest for dirty mouth image stimuli. Reaction times were quickest for neutral mouth stimuli.

The one way ANOVA to compare transformed reaction times for neutral, clean and dirty stimuli across participants showed significant differences between reaction times for the three image stimuli conditions [ $F(2, 3685) = 6.905, p = 0.001$ ] shown in Figure 4.7.

**Figure 4.7 Plot of mean log reaction times for Stroop tests in the mixed methods studies**



### **Mixed methods Stroop test post hoc test results**

Post hoc comparisons using the Tukey HSD test indicated that the mean Stroop reaction time score for the neutral images (M=6.76, SD=0.61) was significantly different to Stroop reaction times for tests with both clean (M=6.77 SD=0.58) and dirty (M=6.85 SD=0.60) image stimuli (Appendix 4.12).

### **Repeated measures ANOVA for differences in reaction times between Stroop test stimuli and blocks**

The repeated measures ANOVA showed a significant main reaction time effect from the different stimuli. Reaction times were slower for dirty stimuli in all blocks [F (2, 80)= 4.953, p=0.009]. Tests also showed a significant main effect from block on reaction times, and reaction times were faster for later blocks [F (2, 80)= 15.654 p=<0.00]. Tests showed no interaction between block and image.

#### **4.11. Mixed methods study implicit association test (IAT) tests**

The purpose of the implicit association test was to capture and measure student nurses' implicit associations between oral care stimuli and emotional disgust to examine the meanings of implicit reactions.

##### **4.11.1. Methods for the mixed methods study implicit association tests**

The implicit association test design was based on previous studies (Grandfield et al., 2005). An open source IAT programme freeiat (Meade, 2009) was used to run five sets of trials with ten trials in each set. The order of these stages is outlined in Appendix 4.13. Instructions, images, target words and test instructions were added to the programme (Appendix 4.14).

##### **Data recording, preparation and analysis**

Once prepared, the programme was then sent for consultation and testing to a person with expertise in the field of emotional disgust measurement using the IAT test. This was to confirm that the tests had been set up correctly and that the results were also being recorded accurately.

##### **Data preparation and analysis**

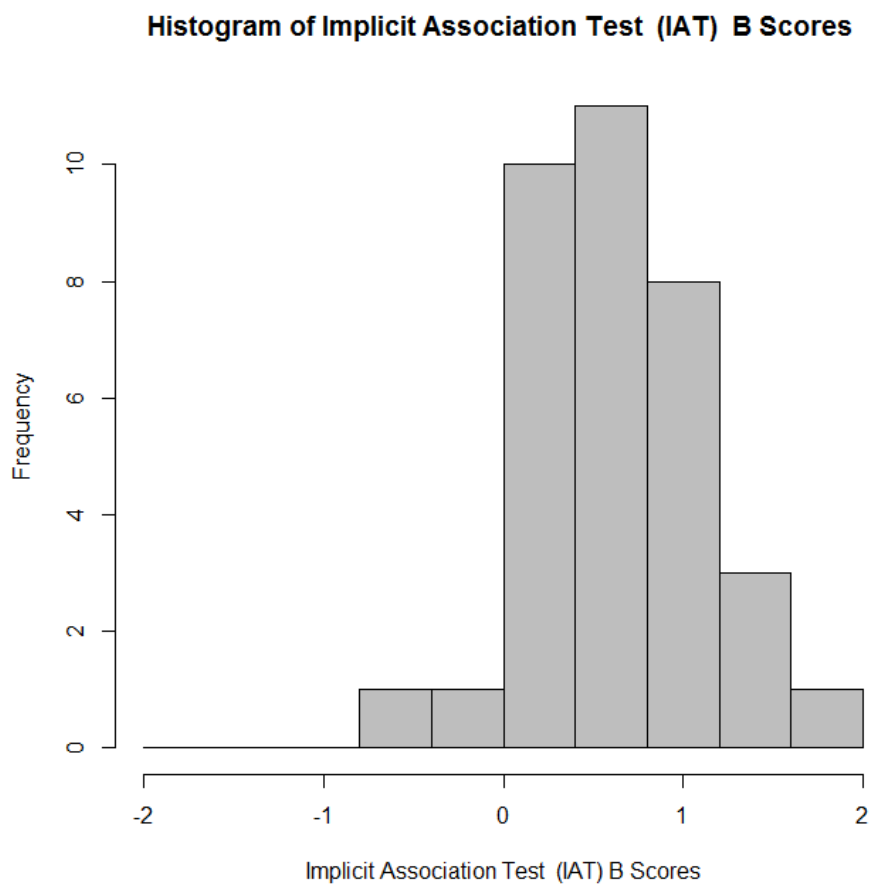
The computer programme recorded and automatically calculated scores from the IAT tests in accordance with Greenwald et al. (2003) to produce IAT Beta scores as outlined in Appendix 4.15. IAT data were retrieved from the computer file. Data checks followed procedures for the Stroop test. In accordance with the guidance (Greenwald et al., 2003), two participants were excluded from IAT analyses as their responses were too slow and were therefore outside the parameters of the test. In accordance with previous studies of implicit responses (Grandfield et al., 2005), IAT data were recoded into two groups based on the median IAT score. These were a low implicit association group IAT with scores of -2 up to and including 0.5, and a high implicit association group with IAT scores Beta over 0.5.

IAT data were analysed using descriptive statistics and histograms to examine the distribution and mean IAT Beta scores for the population in SPSS.

#### 4.11.2. Results for the mixed methods implicit association study

IAT Beta scores were markedly skewed to the left (Figure 4.8) and only two of the participants had an IAT B score below 0.

**Figure 4.8 Histogram of Implicit association test scores for the mixed methods studies**



#### **4.12. Methods for exploring relationships between mixed methods explicit and implicit data**

Data from the mixed methods studies were entered into a single data file in order to examine and compare explicit and implicit responses to oral care. This involved data linking and data analysis.

##### **Data linking**

Data linking was carried out for test variables using the participants' identifiers. Median Stroop test scores and median differences between dirty, clean and neutral stimuli were manually transferred to the main questionnaire database. IAT Beta scores were also manually entered. Data checks were carried out at a later date to confirm the accuracy of the data linking procedure.

As previously described, two respondents were excluded from analyses relating to the IAT test. A further four respondents were excluded from analyses using implicit responses because linking between the datasets could not be confirmed.

Kendals Tau tests of correlation were carried out for attitudinal questionnaire data, questionnaire data, DSS data and median differences in Stroop test scores.

IAT data analyses followed previous studies (De Jong et al., 2003) and, as data were skewed, used Mann Whitney U tests. These were used to examine the differences in implicit responses between individuals who were highly disgust sensitive and those who were not.

##### **4.12.1. Results for the mixed methods studies**

The subset of participants for the second stage of tests was similar to the main sample but it did not include any first year students (Table 4.13).

**Table 4.13 Baseline characteristics of participants in the mixed methods study**

	Characteristics of Participants					
	Stage 1 only			Complete data from stages 1 and 2		
	No	Mean (SD) or %	Range	No	Mean (SD) or %	Range
Age	209*	25	20-55	37	29	20-55
Gender						
Male	20			3		
Female	191			34		
Year of Study						
Year 1	6	3%				
Year 2	118	56%		23	62%	
Year 3	86	41%		14	38%	
*2 missing with no age recorded						

**Relationship between individual responses and questionnaire findings**

The presence of a Stroop effect was not significantly correlated with explicit emotional questionnaire responses.

Participants with greater total scores for disgust towards touching and brushing the mouth demonstrated strong implicit associations between disgust and oral care images (IAT scores above 0.5)  $U=201.50$   $p=0.026$  and  $U=199.00$ ,  $p=0.02$  respectively.

Disgust and dissatisfaction towards not cleaning and both empathetic anxiety and disgust in scenario A were significantly associated with stronger implicit associations between the mouth and disgust ( $p=0.015, p=0.037, p=0.011, p=0.008$  respectively). In addition, significant associations were also seen between stronger implicit associations and dissatisfaction towards not cleaning in scenarios D, F, G and H ( $p=0.014, p=0.02, p=0.011, p=0.39$ ).

### **Relationship between disgust sensitivity and IAT scores in the mixed methods study**

Although variables were not significantly correlated, trends were seen for Stroop, and DSS data. Participants with the greatest disgust sensitivity scores showed slower Stroop responses.

Participants with a positive Stroop response had significantly higher IAT scores  $U=177$ ,  $p=0.03$  than those who did not.

### **Summary of results, analyses and key findings for the mixed methods studies**

An overview summary of the tests, analyses and key findings for the mixed methods studies are presented in Table 4.14.

**Table 4.14 Summary of results, analyses and key findings for the mixed methods studies**

Data source	Data	Purpose	Analysis	Key findings
Mixed methods study questionnaire	Ordinal and nominal data	Examine and compare participant ratings for: Previous experience of oral care <ul style="list-style-type: none"> <li>Disgust (physical and moral) towards the mouth and oral care</li> <li>Anxiety (physical and moral) towards the mouth and oral care</li> <li>Anxiety, disgust and satisfaction when cleaning the teeth</li> </ul>	Examination of response frequencies using <ul style="list-style-type: none"> <li>Data tables</li> <li>Bar plots</li> <li>Scatter plots</li> <li>Parallel plots</li> </ul> Compare responses with: <ul style="list-style-type: none"> <li>Contingency tables</li> <li><math>\chi^2</math> tests</li> </ul>	<ul style="list-style-type: none"> <li>Physical experiences (touching and the provision of tooth brushing) evoked disgust and anxiety.</li> <li>Moral emotions were distinct from physical emotions.</li> <li>Disgust was associated with emotional anxiety towards oral care.</li> <li>Intentions to provide oral care varied in relation to presenting situations; variations include, changes to the selected method for and frequency of oral care.</li> <li>Intention to provide toothbrushing care was not associated with the intention to use swabs for oral care.</li> <li>Student nurses' Intended toothbrushing or swab oral care frequencies were not correlated with emotions.</li> <li>Help seeking behaviour was correlated with anxiety towards physical touching and brushing teeth and physical disgust in the most unpleasant scenarios.</li> <li>Being gentle or avoiding areas of the mouth in the cleanest mouth scenario was associated with moral disgust empathetic emotions of disgust and anxiety.</li> </ul>
		Explore relationships between behavioural intentions in each scenario	<ul style="list-style-type: none"> <li>Mann Whitney U tests</li> <li>Kendals Tau correlations</li> </ul>	
		Explore underlying components for aggregate emotional and behavioural responses	<ul style="list-style-type: none"> <li>Pearson's moment correlations</li> <li>Principal component analysis</li> </ul>	



### Summary of results and analyses from the mixed methods studies continued

Data source	Data	Purpose	Analysis	Key findings
Mixed method study attitude questionnaire	Ordinal and nominal data	Examine and compare participant ratings for attitudes towards oral care	Examination of response frequencies using <ul style="list-style-type: none"> <li>• Data tables</li> <li>• <math>\chi^2</math></li> </ul>	Finding the mouth unpleasant was associated with difficulty cleaning. Attitudes towards oral care are not associated with oral care behavioural intentions.
		Explore the relationship between attitudes, emotions and oral care behaviours in the mixed methods studies	<ul style="list-style-type: none"> <li>• Kendals Tau correlations</li> <li>• Spearmans rank correlations</li> </ul>	
Disgust sensitivity	Ordinal and nominal data	Examine disgust sensitivity in the population under test.	Tests for normality <ul style="list-style-type: none"> <li>• Q-Q plots</li> <li>• Kolmogorov–Smirnov</li> <li>• Shapiro–Wilk</li> </ul> Examination of response frequencies using <ul style="list-style-type: none"> <li>• Data tables</li> <li>• Histograms</li> </ul>	Student nurses who have a greater propensity for emotional disgust were more likely to feel disgusted and anxious touch in the mouth or brushing teeth. Disgust sensitivity was not associated with moral emotions towards the mouth or satisfaction towards the provision of care Disgust sensitivity was not associated with the frequency of oral care provided.
		Examine relationships between disgust sensitivity and mixed methods questionnaire emotions and behaviours	<ul style="list-style-type: none"> <li>• Pearson's correlations</li> <li>• Kendal's Tau correlations</li> </ul>	
Mixed method study Interview	Textual transcript	Verify the content of the scenario, image scenarios, questions, response scales and responses to the revised questionnaire	Thematic analysis to confirm the meaning of the patient scenario, image scenarios, questions, response scales and responses to the revised questionnaire	Questionnaire content and responses verified

### Summary of results and analyses from the mixed methods studies continued

Data source	Data	Purpose	Analysis	Key findings
Stroop tests	Reaction time data	<p>Compare reaction time data for clean, dirty and neutral image blocks for:</p> <ul style="list-style-type: none"> <li>• Reaction time data for stimuli</li> <li>• Reaction time data for stimuli and blocks</li> </ul>	<p>Histograms</p> <p>Tests for normality</p> <ul style="list-style-type: none"> <li>• Q-Q plots</li> <li>• Kolmogorov–Smirnov</li> <li>• Shapiro–Wilk</li> </ul> <p>Stroop test reaction times for stimuli</p> <ul style="list-style-type: none"> <li>• One-way ANOVA post hoc Tukey HSD</li> </ul> <p>Stroop test reaction times for stimuli and blocks</p> <ul style="list-style-type: none"> <li>• Two way repeated measures ANOVA</li> </ul>	<p>Implicit responses were different for clean, dirty and neutral images</p>
Implicit Association test	Reaction time data Beta scores	<p>Examine IAT Beta scores across participants.</p>	<p>Histograms</p> <p>Tests for normality</p> <ul style="list-style-type: none"> <li>• Q-Q plots</li> <li>• Kolmogorov–Smirnov</li> <li>• Shapiro–Wilk</li> </ul>	<p>Most nurses associated a dirty mouth with emotional disgust. Student nurses who have a greater propensity for emotional disgust implicitly associate the dirty mouth with disgust. Student nurses who hold strong implicit associations between the dirty mouth and disgust are more likely to experience disgust when touching the mouth and disgust when brushing a patient's teeth.</p>
		<p>Examine the relationship between IAT Beta scores and:</p> <ul style="list-style-type: none"> <li>• Emotion and behaviour intention in mixed methods questionnaire responses</li> <li>• High and low DSS groups</li> </ul> <p>Stroop reactivity groups</p>	<ul style="list-style-type: none"> <li>• Kruskal Wallis</li> <li>• Mann-Whitney U</li> </ul>	

## **4.13. Discussion**

This, the final discussion in this thesis, is divided into two parts. The first part addresses the final studies in the thesis; this commences with the aims and objectives of the mixed methods studies. It considers revised methods and findings for each of the mixed methods studies. Methods for analysis across these studies and findings are then considered, leading to the second part of the discussion.

The second part of the discussion draws the findings from the studies in this thesis together. It addresses the overall aims and objectives of the thesis and considers the extent to which these have been addressed leading to the conclusions and recommendations for future research.

### **4.13.1. Aims and objectives of the mixed methods study**

The overall aim of the mixed methods study was to examine and compare student nurses' explicit and implicit emotional responses towards oral care for hospitalised adult patients. The revised questionnaire and interview studies collected and examined student nurses' explicit emotional responses to oral care using a questionnaire-based tool, which was used for the first objective towards this aim. The disgust sensitivity study was used to explore the relationship between emotional predisposition to emotional disgust and emotional responses to oral care, was used to meet the second objective. Stroop and implicit association tests on a subset of the questionnaire sample were used to measure student nurses' implicit reactions to oral care stimuli, meeting the third objective. The findings of the mixed methods studies were then analysed together, comparing explicit and implicit responses, to achieve the final objective towards this aim. The strengths and limitations of the methods and findings towards the aim and these objectives will be considered.

#### **4.13.2. Discussion of the methods and results from the mixed methods studies**

Methods and results for each study will be discussed in turn commencing with the revised questionnaire, attitude disgust sensitivity studies. The second stage interviews, Stroop tests and implicit association tests on a subset of the first stage questionnaire study sample will then be considered. Analyses across the studies will then be discussed.

##### **Mixed methods study questionnaire methods**

Following recommendations from the pilot study, revisions were made to the mixed methods questionnaire to make it more acceptable for participants and to improve participation. Changes were also made to explore the effect of changing the scenario. These revisions appeared to be successful at meeting this objective as the questionnaire was reportedly more acceptable to participants. Missing data analyses of questionnaire data revealed no missing data trends and participants did not appear to be deliberately omitting specific questions. Interview findings confirmed that none of the questionnaire questions were reported to be unacceptable. In addition, none of the interview participants reported that the questionnaire was too long and there was no indication to suggest that questions were unacceptable or misunderstood. Furthermore, recruitment was achieved and participants completed the questionnaire in the mixed methods study. Therefore the revised questionnaire methods appeared acceptable to the study population.

The number of images was reduced in order to shorten the final questionnaire. Factor analysis would have been an appropriate approach for this (DeVon et al., 2007, Tabachnick and Fidell, 2007) but due to the time commitment involved, the sample in the pilot was too small for factor analysis to be used as a basis for item reduction. Pilot data and interview data were used for item selection in the mixed methods study and participants stated that descriptive scenarios and images used in the revised tool were appropriate for nursing care. In addition, the revised questionnaire findings confirmed different emotional responses and intended oral care behaviours

for each of the images. It is possible that emotions relevant to care were missed because the number of images had been reduced from the pilot study. Interview participants were however asked to suggest and discuss anything additional that they felt was relevant to oral care experiences on the ward and no further suggestions were made. This suggests that the revised questionnaire included a range of relevant situations for oral care.

Principal component analyses validated construct validity in the study in accordance with recommended practices (DeVon et al., 2007). Temporal stability of responses to the questionnaire was however not tested in the study. As participants were undergoing training, it is possible that their responses may have changed over time and with training. A study to examine the reliability of responses over time and the impact of training in accordance with recommended questionnaire validation practices (Oppenheim, 1992) and confirmatory factor analyses in accordance with recommended guidance (DeVon et al., 2007) is therefore recommended for future studies.

Improving the acceptability of the questionnaire involved adapting the questionnaire from computer-based delivery to paper based in lectures. It is possible that shared social emotions in the lecture influenced the results as emotions can be influenced by mood and group interactions (Gohm, 2003, Duggleby, 2005, Windmann and Chmielewski, 2008, Vogt et al., 2010). Similarly, it is not possible to know the conditions in which a remote online questionnaire is completed. Although it is possible that the method of administration influenced emotional responding, questionnaire study responses were similar to those seen in the pilot administered in a controlled environment. This implies the environment did not affect the present study findings and that these modes of delivery were suitable.

Recruitment for the mixed methods questionnaire was targeted at those who had undertaken their mouthcare training because inclusion criteria included having seen or carried out mouthcare. The population under test were therefore second and third year nursing students. Although this focussed sample potentially limited the generalisability of the present study findings, it

reduced the variability of the sample population, reducing the chance of bias. It was anticipated that, once tested, further studies should be used to examine the concepts in a wider population.

The use of paper questionnaires did result in an increase in the amount of missing data. Missing data were investigated and although above the desired level of 5%, there was no evidence that missing data were significantly distributed in a way that would bias the findings. The majority of missing data were missing because of one value and so analyses with and without replacement of missing data were undertaken to assess the effects of missing data on analysis.

The numbers of analyses conducted were limited to avoid the possibility of a spurious error as a result of multiple analyses (Austin et al., 2006). Agreement between data and studies suggested that a spurious result had not occurred.

The majority of questionnaire analyses followed the pilot study. As nursing care involves many different experiences, aggregation of emotional response scores was undertaken in order to obtain overall scores for emotional experiences across a range of oral care scenarios. The use of subscales to produce an aggregated measure is established and has been used in studies to explore relationships across scenarios (Sinharay et al., 2007, Sinharay and Haberman, 2011, Sinharay et al., 2011). The potential weakness with this approach was that scenario ratings may not have equal weight. A number of methods of weighting the scenarios were attempted with the assistance of a statistician but after consideration, no weightings were applied because on an applied level, it was considered that each patient should be equally considered.

### **Discussion of the mixed methods questionnaire findings**

The sample recruited in the present study was predominantly female reflecting the trends in the profession. The implication for the study findings is that disgust stimuli may affect men and women differently, and so it is possible that the present findings are influenced by the gender of

participants. In the study, age was not associated with emotion or behaviour; however, age data were skewed because of the predominance of younger participants. Age has been associated with attitudes towards oral care (Ganz et al., 2009) and is possible that there was a relationship between emotions towards oral care and age which was missed due to low numbers of older nurses. Further research with a larger sample is therefore indicated to investigate differences between men and women and between age groups.

Participants' previous experience of one procedure was associated with previous experience of another. It is likely that these associations related to both opportunity as well as attitude. Previous oral care experience was significantly associated with current oral care experience. This relationship is plausible, because people who carried out oral care in the past may be likely to continue with these practices, whilst some people who did not carry out oral care in the past may have omitted care because of difficulties in carrying out oral care. It is however difficult to compare these results to previous studies because of the internal validity issues from the use of generic oral care terms in the past.

Emotions of anxiety, disgust, dissatisfaction and satisfaction were reported in the present study. These emotions agreed with the pilot study and attitudes. These emotions also corroborated reports of unpleasantness in care home and hospital oral care literature (Eadie and Schou, 1992, Weeks and Fiske, 1994, Binkley et al., 2004, Furr et al., 2004, Reed et al., 2006). The existence of these emotions in relation to oral care was therefore corroborated by the present study.

Emotional disgust and anxiety intensity was greater in the scenarios rated as most unpleasant in the card sort. As studies have produced images and wordlists with emotional affect and intensity ratings (Lang et al., 1993, Bradley and Lang, 1999, Libkuman et al., 2007, Lang et al., 2008), variations in emotional intensity and valence are plausible. Although participants' responses showed similar trends, the study also found differences in individual responding. This finding is also plausible as individuals use

different emotion regulation strategies to deal with situations (Gross, 1998, Gross, 2002, Gross and John, 2003, Gross and Thompson, 2007). Emotion regulation is associated with individual differences in emotional responding (Gross and John, 2003). The present study finding therefore supported the inclusion of measures of individual differences in emotion for the present and future studies.

Disgust and anxiety towards touching the mouth and providing brushing care were associated. A relationship between these physical acts is plausible because both involve touching. This finding agrees with studies which have associated touching objects with both disgust and avoidance and (Vogt et al., 2010). This finding also agrees with reports from oral care studies which have inferred that finding the mouth unpleasant is a reason why care is not provided (Eadie and Schou, 1992, Weeks and Fiske, 1994, Reed et al., 2006). In addition, the first principal component derived from the principal component analysis in this study related to the emotions of physical care. Contamination related disgust and anxiety are associated with behavioural avoidance (Oaten et al., 2009, Van Overveld et al., 2010a, Curtis et al., 2011). These data therefore corroborate a relationship between disgust, anxiety and physical contact with the mouth, particularly in unpleasant scenarios. The clinical implication for the present study findings are that that care may be avoided in unpleasant conditions and therefore those who need the most care may be less likely to receive it.

In the present study nurses were most disgusted, dissatisfied and anxious with the prospect of not providing oral care in the most unpleasant scenarios. These moral emotions, which were also reported in the focus group and interview studies comprised the second principal component of the questionnaire analysis. It should however be considered that focus group and interview studies found that a lack of care could be socially unacceptable. Further to this, the main researcher was a dentist and participants' responses may have been influenced by what they thought the researcher wanted them to feel. It is therefore possible that questionnaire



findings were influenced by social desirability bias despite the fact that questionnaires were completed anonymously.

Although no studies have been identified to show this in the oral care literature, reduced moral motivational drivers have been shown in relation to helping behaviours for students (Weiner, 1980, Schmidt and Weiner, 1988). Furthermore cleansing is considered to be a moral act (Schnall et al., 2008b, Schnall, 2011) and nurses' moral judgements are associated with behaviour (Parker, 1990, Oddi and Cassidy, 1994). These findings and the wider literature agree and so it is plausible that these moral emotions have a role in motivating oral care. However, it is difficult to be specific about which emotion provides the strongest motivation or how these moral emotions are used to enable care. Vogt et al. (2010) suggested that cleaning actions are undertaken to reduce discomfort arising from disgust. Hence, a nurse could potentially alleviate their emotional discomfort by providing oral care. This agrees with the theory of cognitive dissonance which suggests that behaviours are undertaken for the purpose of reducing discomfort (Festinger, 1962). The literature also suggests that cleansing behaviours have a positive impact on dissonance (Lee and Schwarz, 2010a). These findings agree that unpleasant situations may motivate care.

Empathetic emotions were identified as the fourth principal component from questionnaire analyses. These empathetic emotions varied with the scenarios and nurses expressed the most anxiety and disgust towards being a patient in the scenarios with the most physical debris. Empathy is considered to be important in nursing and it is possible that empathetic emotions inform nurses' oral care decisions in the same way as is seen in general nursing care (Wurzbach, 1996, Tangney et al., 2007).

The association between empathy and moral emotion and action is established in the wider literature with studies of moral situations and behaviour (Batson). This finding is also supported by the embedded nature of empathy within the care literature (Wurzbach, 1996, Tarlier, 2004, Wilkin and Slevin, 2004). This finding is also important because empathy has been

associated with emotional intelligence, stress (Augusto Landa et al., 2008) and using emotions to make decisions (Freshwater and Stickley, 2004).

Student nurses were less disgusted, dissatisfied and anxious with the prospect of not providing oral care for the healthiest mouths. Although not associated with care frequencies, oral care was most often intended for the most unpleasant scenarios. This evidence further corroborates an association between emotion and oral care motivation. The clinical implication for this is that patients who have healthy mouths could potentially receive less care because there is less of a motivation to act. Oral health declines without regular care (Axelsson and Lindhe, 1978, Axelsson and Lindhe, 1981) and the lack of motivation suggested may be one of the reasons for oral health decline on entering hospital (Terezakis et al., 2011). Similar to moral emotions, empathetic motivation was also not associated with behavioural measures in the study. However, the majority of nurses in the study reported experiencing empathetic emotions and indicated that they would intend to provide oral care and there may not have been sufficient sensitivity to identify an effect. As a consequence this recommends that the moral and physical and empathetic motivations to provide oral care be further explored in a larger sample of participants.

Intended care varied considerably between scenarios. All participants indicated an ability to provide oral care however, the proportion of nurses who intended to provide twice daily oral care for patients as per the recommended standard varied between the scenarios from 74% in scenario G to 39% in scenario F. This finding is similar to the pilot study and fits with the interview study theoretical model (Figure 2.4). It therefore appears that an ability to provide oral care does not equate to all patients receiving care. This suggests that further studies in nurses willing to provide oral care are indicated to understand omissions of oral care for patients.

In the present study participants were less anxious and disgusted dealing with a totally dependent patient when compared to a patient who was less dependent and could resist care. Chalmers et al. (1996) and Jablonski et al. (2009, 2011a, 2011b), have identified a reluctance to provide oral care in

situations for patients with resistant behaviours. Present study findings support the idea that resistant behaviours may affect the quality of care given to patients and may mean that some patients receive more effective oral care than others. This finding also reinforced the earlier proposals that stable oral conditions are required for the measurement of emotion towards oral care.

The present study showed no relationships between care frequency and emotions. This finding may be because most nurses in the study intended to provide some form of oral care and so there are too few participants in the sample who did not intend to provide care to detect an effect. Further investigations to compare participants unwilling to provide care and those willing to provide oral care are recommended.

The third principal component identified in the present study was the modification of oral care. The majority of nurses in the mixed methods questionnaire study intended to modify their care action by being gentle or particularly careful when providing care, indicating that they would be most gentle in the most unpleasant looking scenarios. As with using swabs, being gentle and avoiding areas of oral care appears to be a coping strategy to deal with difficult and unpleasant situations consistent with behavioural modification to mediate the emotional state (Folkman and Lazarus, 1988, Lazarus, 1999).

Oral care with swabs was associated with being gentle when cleaning and with negative emotions such as anxiety and disgust toward oral care. The use of swabs may therefore be a coping mechanism or mechanism for providing oral care with the minimum emotional burden. This finding was corroborated by cognitive dissonance theory (Festinger, 1962), and emotion regulation theories (Gross, 1998, Gross, 2002, Gross and John, 2003, Gross and Thompson, 2007) which suggest that behaviours, such as cleansing can alleviate emotional discomfort. This adaptive behaviour also corroborates the theoretical models from the focus group and interview studies in this thesis and was supported by the principal component analysis of data in this study.

Help seeking behaviours were most commonly reported in relation to the most unpleasant scenarios and were associated with physical emotional anxiety towards oral care. Help seeking may again reflect vigilant coping strategies (Folkman and Lazarus, 1988). Seeking help in relation to anxiety appears to be a logical action, which fits with avoidant behaviours for phobias. The relationship between help seeking and anxiety, which is also seen in the pilot study, and was supported by the implicit association test results, appears to demonstrate that oral care is modified in relation to emotional anxiety as proposed the theoretical model from the interview study. This suggests that modification to oral care behaviours is associated with emotions. As these modifications may reduce the quality of oral care given to patients, this study recommends that these adaptive behaviours and the emotions associated with them are further investigated.

The questionnaire study identified a fifth principal component comprised of satisfaction and being gentle. The provision of care is often considered in relation to the presence or absence of a care activity, however for nurses, care also involves nurturance and intimacy. Certainly the concept of wellbeing is important for nursing care (Wurzbach, 1996, Berry and Davidson, 2006) and dealing with the body, although difficult, can also be satisfying as an experience (Picco et al., 2010). Hence the concept of caring emotion appears to relate to the concept of well-being and the theoretical model of emotions from the interview study (Figure 2.4).

### **Discussion of mixed methods attitude questionnaire study**

Attitudes towards oral care were collected and examined in the present study for the purpose of exploring the relationship between attitudes and behaviours. Most questions were completed but only 217 of the sample answered the question regarding personal encroachment. There is no evidence to show why this question was most often omitted; however 80% of those who responded admitted to feeling this discomfort. It may be that this attitude is less acceptable to admit than others and so this merits further investigation.

Participants in the study had positive attitudes towards oral care with over 95% and 80% of nurses stating that oral care is 'good nursing' and 'had to be done' respectively. This was confirmed by the findings of the second attitudinal questionnaire whereby the majority of the sample (87.9%) agreed or strongly agreed that oral care was a high priority.

In the present study, two thirds of participants (67%), reported that they did not find providing oral care repulsive, which is consistent with the previous studies of nurses in care settings (Wardh et al., 1997, Wardh et al., 2012). At face value, this would suggest that oral care was not a repulsive activity for most nurses. This however conflicts with the emotional responses to the unpleasant scenarios. This suggests that attitudes may account for pleasant oral care situations but not for unpleasant situations where care is most needed.

There was a relationship between attitudinal difficulty providing oral care and unpleasantness. There was also a weak association between disgust touching and finding 'oral care repulsive in the present study. Although these associations were weak, they did provide evidence, which fitted with the interview study theoretical model (Figure 2.4) and the argument that unpleasantness is a barrier to oral care. Therefore the evidence agrees with the argument that emotional disgust can be a barrier to oral care.

### **Discussion of the mixed methods disgust sensitivity study**

In the mixed methods studies, disgust sensitivity measures were captured to examine individual differences in sensitivity to disgust and then explore relationships between these and responses from the other mixed methods studies. Established DSS questionnaire methods (Haidt et al., 1994) revised by Olatunji et al in 2007 were used. There were no issues with participation administration scoring or analysis. The main weakness of the DSS was that it was written in American English and a minor adaption was made to change the word trash to dustbin in accordance with instruction from the School of Psychology Ethics committee. This may have affected the validity of the tool, however, it had previously been adapted, validated and used in a number of other languages. There was no evidence to suggest any misunderstandings

of terminology and data collected were distributed normally. The tool, as an established method, therefore appeared to be appropriate for the purpose of the study.

Disgust sensitivity data were normally distributed through the population in the study which indicated that participants in the study were neither particularly prone nor were they insensitive to disgust. No studies of individual differences in nursing populations were found for comparison and so this distribution could not be confirmed as normal for a nursing population but studies of disgust sensitivity have shown normal distributions (Mataix-Cols et al., 2008), therefore the study sample appeared to be normal.

### **Discussion of the mixed methods second stage of studies**

The second stage of the mixed methods study was conducted to explore implicit reactions to oral care stimuli and to undertake interviews to confirm the content of the mixed methods questionnaire study. Participants volunteered to attend and undertaken the second stage of tests, therefore the sample may have been biased towards nurses who were more enthusiastic about oral care. When examined, there was no evidence of differences in the mixed methods questionnaire responses between those who attended for second stage tests and those who did not.

Test administration was different to many other Stroop test studies because tests were undertaken outside of a laboratory environment. It is therefore possible the setting reduced the sensitivity of tests for Stroop effects and implicit association. It is also possible that the sample size was too small to detect an effect in the population under test.

### **Discussion of the mixed methods study interviews**

Interviews followed methods used in the pilot study. Interview results agreed with both the mixed methods questionnaire study and the pilot studies. In the study, 41 interview participants confirmed content and face validity for the revised questionnaire. Although a content validity rating score was not produced, these interviews met requirements for the number of assessments

for content validity (DeVon et al., 2007). These findings validated revised questionnaire content and responses.

### **Discussion of the Stroop test in the mixed methods study**

Stroop tests followed the pilot study, however images of heavily restored teeth were removed. This was because pilot card sort study findings identified that participants did not interpret these images consistently and as images were delivered in blocks, it was possible that these images could affect the results.

The population sample demonstrated a Stroop effect, which corroborated the findings of pilot study and this was confirmed by the repeated measures ANOVA for stimuli and blocks. These findings suggested that unpleasant stimuli attracted attention. This finding agreed with previous studies that tested physical responses and self-reported emotions towards unpleasant image stimuli (Mataix-Cols et al., 2008). Tests were significantly influenced by block order and participants were faster at later tests. Stroop tests have been used in many studies for identifying interference effects (MacLeod, 1991, De Ruiter and Brosschot, 1994, Constantine et al., 2001, Hester et al., 2006) and randomisation is included within the design for this reason. Test findings showed that the different stimuli produced different reactions irrespective of the blocks, confirming the effect.

Stroop tests in the present study were not designed to confirm nor refute emotional reactions towards oral care stimuli on an individual level, as these tests are not used for that purpose. Furthermore, although image content was reported using emotive terms in the card sort interviews, the Stroop test did not attribute verbal or descriptive emotional content to the Stroop responses. As a result, there were limitations to the implicit emotional information derived from Stroop test data and a test designed for individual level emotional responses may have provided stronger implicit emotion evidence for individual emotional reactions towards oral care. The agreement of these different tests to detect emotion did corroborate the presence of emotional reactions to oral care stimuli.

### **Discussion of the implicit association tests in the mixed methods pilot**

Implicit association tests were added to the mixed methods study to collect implicit emotional reactions in a way that could be attributed to meanings. A pre-existing implicit association test was not used, as none were available for this study. Methods however followed an established structure (Greenwald et al., 1998, Greenwald and Nosek, 2001, Greenwald et al., 2003, Grandfield et al., 2005, Nosek et al., 2005, Lane et al., 2007b, Nosek et al., 2007) and a psychologist experienced in implicit association testing verified the tests. It was therefore not possible to compare results to previous findings using the test however, all of the evidence suggested that the test was developed, produced and conducted in accordance with established practices and was therefore appropriate.

Although all second stage participants undertook the study, two participants were excluded from analyses as their reactions were too slow and did not meet the criteria for analysis (Greenwald et al., 2003). There was no evidence to suggest that these participants were outliers. It is possible that the strength of association between oral care and disgust may have extended reactions beyond the parameters of the test for these participants. As only two participants had this response, it was not possible to determine whether this was the case but a further study with a larger study sample may explain these responses further.

The majority of participants associated the dirty mouth with emotional disgust, which suggests that implicit associations are relevant to oral care.

### **Discussion of analyses across the mixed methods studies**

Analyses were undertaken using a linked data set. Memorable word and numbers were used for data linking but a small number could not be confidently linked to the implicit test data. This reduced the amount of cross-linked data available for analyses, which included implicit data. Tests (Tabachnick and Fidell, 2007) showed no evidence to suggest that these missing data biased the results. To minimise data loss, alternative methods



of cross linking data may need to be considered for any further studies of this nature.

### **Discussion of the relationship between attitudes and the mixed methods findings**

Reports of unpleasantness towards oral care agreed in the mixed methods studies. These responses contradict with negative self-attitudes seen in previous studies (Chalmers et al., 1996, Wardh et al., 1997, Furr et al., 2004) towards oral care. The percentage of participants reporting that oral care was not unpleasant was similar to other studies (Willumsen et al., 2012). It is possible that participants were unhappy to admit a general aversion towards oral care, however, most reported disgust and anxieties towards specific scenarios in the mixed methods questionnaires and interviews, which suggests that they were aware of their feelings. In view of this, this evidence corroborates the argument that generalised attitudinal questions may be insufficiently sensitive to explicit implicit emotional responses to specific oral care situations.

The mixed methods attitude study findings suggested positive attitudes towards oral care. A willingness and ability to provide oral care was also seen in the reports of past and present oral care experiences. Despite these positive attitudes and a general willingness to provide oral care, it was clear that in the different scenarios patients would not receive the same level of care. It was also evident that attitudes were not associated with intended oral care. The patients with the greatest need for care may receive oral care twice per day but these patients would most likely have areas of cleaning missed or techniques chosen would not meet the necessary levels to be effective (Axelsson and Lindhe, 1978, Axelsson and Lindhe, 1981). This evidence corroborates suggestions earlier in the thesis that the general attitudes towards oral care are insensitive to differences in patients' care needs and do not explain omissions in care.

The mixed methods studies showed that disgust towards touching and brushing the teeth were associated with the attitude measure, finding oral care repulsive. The suggestion that those participants who found oral care

repulsive in general would also find touching and brushing teeth in specific situations to be disgusting is plausible as contamination related anxieties have been shown to predict behaviour (Deacon and Olatunji, 2007). These findings allude to a sense of physical disgust towards oral care stimuli, which agree with reports of disgust in the qualitative and pilot studies in this thesis and with reports of unpleasantness towards oral care in the wider literature (Eadie and Schou, 1992, Weeks and Fiske, 1994, Chalmers et al., 1996, Wardh et al., 1997, Furr et al., 2004, Reed et al., 2006). These findings also infer that anxieties towards oral care are underpinned by a sense of unpleasantness and disgust and therefore there may be contamination threat related anxieties as described in the literature (De Jong et al., 2002, Charash, 2004, Olatunji et al., 2004, Rachman, 2004, Huijding and de Jong, 2007, Charash and McKay, 2009, Olatunji et al., 2009b). Therefore, evidence in this study suggests that oral care can be physically unpleasant and that disgust and disgust related anxiety is relevant to the experience of oral care.

Disgust towards touching and brushing in the mixed methods questionnaire was also associated with feeling that mouths “get worse no matter what I do”. It is possible that the association between the generalised attitude of being unable to improve oral care and feeling both anxiety and disgust may be because people who find oral care difficult may also be less effective at oral care. This agrees with evidence that shows that individuals who find providing care unpleasant spend less time cleaning teeth (Chalmers et al., 1996). Emotions of disgust have been associated with avoidant behaviours (Woody and Tolin, 2002, Deacon and Olatunji, 2007). Therefore this link is plausible but is not fully explained by these findings. This finding suggests that relationships between attitudes, emotions and avoidant behaviour need further investigation.

### **Discussion of the relationship between disgust sensitivity and the mixed methods findings**

In the present study, disgust sensitivity was moderately correlated with anxiety and disgust towards touching the mouth. There was also a weak but

significant relationship with disgust and anxiety experienced whilst cleaning the mouth and empathetic disgust. The relationship between disgust sensitivity and the physicality of touching a clean mouth is credible because people who are particularly prone to feeling disgust have been shown to feel disgust in relation to touching something unpleasant (Olatunji, 2010, Vogt et al., 2010). Those who were most disgust sensitive were therefore most likely to indicate that this was towards physical and not moral aspects of the experience in this study. Therefore reports of disgust towards providing oral care in these studies appeared to be underpinned by physical disgust towards care.

Disgust sensitivity was not associated with intended behaviours in the present study and the study findings show that nurses who are disgust sensitive still appear to carry out oral care. This suggests that physical disgust relates to oral care but is not the only factor in whether or not a nurse intends to carry out oral care. This suggestion is plausible as the mixed methods questionnaire and the pilot studies demonstrated moral emotions towards carrying out care. This also indicates that tendencies towards emotional disgust and personality may not predict whether care is carried out. However it may indicate that some individuals may be more likely to need additional support in dealing with their emotions whilst providing care. This is an important area for further research.

### **Discussion of the relationship between Stroop responses and the mixed methods findings**

Stroop effects were seen across the population, which confirmed that reactions to the unpleasant stimuli were different to pleasant oral care stimuli. Stroop test reactions were however not associated with behaviour or emotion on an individual level. This may reflect a lack of sensitivity of this test on an individual level. Stroop tests findings were, however, associated with IAT tests results and with disgust sensitivity test findings. The relationship between implicit findings towards the same stimuli agreed that both tests were measuring similar or associated concepts. In view of the relationship seen in the studies between these implicit reactions, disgust and

anxieties towards touching, it is likely that these concepts are underpinned by physical disgust. Slower Stroop reaction times have been associated with contamination related anxieties and this is therefore plausible (Charash and McKay, 2002, Charash and McKay, 2009). Furthermore, the Stroop tests may also have been insufficiently sensitive to detect differences on an individual level in this population, as mixed methods studies showed that this population was willing and able to provide oral care. Implicit differences may therefore have been too subtle for Stroop tests in this population. Therefore further investigations using Stroop tests responses between those willing to provide oral care and those unwilling or unable to provide oral care, similar to other studies of contamination related anxieties (Charash and McKay, 2002, Olatunji et al., 2004, Deacon and Olatunji, 2007) may be indicated for future studies.

#### **Discussion of the relationship between implicit association test responses and the mixed methods findings**

The majority of participants in the study implicitly associated the unclean and dirty mouth images with disgust. Participants who highly associated the mouth with disgust were more likely to feel disgust touching or brushing the mouth. This was true for the majority of scenarios with the exception of the most unpleasant, where most participants indicated disgust, reducing the sensitivity of the test. This finding agrees with the suggestion that individuals who implicitly associate the mouth with disgust are most likely to find cleaning teeth unpleasant. This agrees with studies of contamination related disgust and anxieties, which showed unpleasant and contaminated images, evoked similar reactions (Grandfield et al., 2005, Huijding and de Jong, 2007).

Implicit association test findings were not associated with intended oral care behaviours in the present study. This may be explained by a lack of sensitivity of the IAT test because virtually all participants implicitly associated the mouth with disgust. The lack of an association between behaviour and the IAT results may also reflect a lack of sensitivity on the part of the measure of behaviour. Chalmers et al. (1996) for example, found that

carers who found oral care unpleasant spent less time undertaking oral care. Therefore it is possible that student nurses would provide oral care regularly but those who are most disgust sensitive, who implicitly associate oral care with disgust or who have the least effective coping strategies (Lazarus and Folkman, 1984) would provide less effective care. This would be best measured with actual behaviours similar to other studies linking behaviours and emotions (Dorfan and Woody, 2011, Willems, 2011). A more intricate measure for oral care effectiveness on a practical level would be recommended for further research.

#### **4.14. Discussion of the thesis findings**

This, the final discussion in this thesis will draw together and discuss the findings of the studies in this thesis. A conclusion will be presented and suggestions for further research will be discussed.

The aim of the research in this thesis was to understand how nurses' and student nurses' emotional experiences and reactions influence the provision of oral care for hospitalised adult patients. The objectives were to: describe the range of nurses' and student nurses' emotional experiences towards nursing care for the adult mouth in hospital, to identify nurses' and student nurses' perceptions of their roles and responsibilities towards patient oral care, to examine and explore student nurses' implicit and explicit emotional experiences of oral care, and to develop an understanding of the relationship between nurses' and student nurses' implicit and explicit emotions and oral care behaviours for adult patients in hospitals.

##### **Discussion of the range of nurses' and student nurses' emotional experiences towards nursing care for the adult mouth in hospital**

The initial focus group and interview studies in this thesis identified the range of nurses' and student nurses' emotions towards oral care. Emotions of disgust, anxiety, satisfaction and dissatisfaction were common threads through each of the studies. Although these themes have been inferred in previous studies individually (Furr et al., 2004, Forsell et al., 2010, Forsell et

al., 2011, Willumsen et al., 2012), the presence and relevance of these emotions has not received attention.

Disgust and anxieties in the present studies were related to physical experiences of the mouth and moral feelings towards behaviours. These distinctions agree with concepts towards the mouth within the existing literature that suggest that emotional disgust and anxieties arise from bodily violations (Russell and Giner-Sorolla, 2013) and social boundaries (Rozin et al., 1995).

Previous studies of oral care have attributed care failings to single attitudes mainly relating to physical unpleasantness (Binkley et al., 2004, Furr et al., 2004) and or anxieties towards care resistance (Jablonski et al., 2005, Jablonski et al., 2011a, Jablonski et al., 2011b, Willumsen et al., 2012). Although the present studies agree that disgust may relate to avoidant behaviours, the studies also indicated that this is a complex emotional experience involving both moral and physical experiences.

Of the emotions identified in the studies, disgust was a common thread through this thesis and measures relating to disgust were captured in each of the studies. Furthermore, participants used experiences of unpleasantness as the basis of their answers to the pilot card sort study. This emotion agrees with the literature as unpleasantness has been identified in attitudinal studies of oral care (Binkley et al., 2004, Furr et al., 2004) however these previous studies did not explore the role of emotional disgust. The present study also showed that anxieties were reported in relation to disgust similar to studies of contamination related disgust and anxieties (Thorpe et al., 2003, Charash and McKay, 2009, Bianchi and Carter, 2012, Williams et al., 2012).

Satisfaction towards oral care was also identified in the studies. This has received little attention in the oral care literature. Satisfaction is however a positive emotion, which has been associated with positive goal achievements (Locke et al., 1970, Galand et al., 2012) and may motivate care, therefore the presence of satisfaction as a reward for providing care agrees with the literature. This experience was not investigated in detail in these studies and

further studies relating to oral care satisfaction are indicated as a result of these findings.

Studies in this thesis also identified other emotions such as pride, guilt but, due to the focus on the most commonly reported emotions of disgust and anxiety; these were not investigated in as much detail. These emotions are associated with motivation (Berkowitz and Levy, 1956, Williams and DeSteno, 2008) (Tangney et al., 1996, Tangney et al., 2007) and may have a relevance to the oral care provided and the focus on disgust and anxiety was because these were the most commonly reported emotions in the studies. The present studies indicate emotions such as pride and guilt are relevant to oral care and that further investigation of the role of these emotions may further explain oral care provision.

The studies in this thesis therefore identified a range of emotions towards oral care. These included emotions towards the moral and physical aspects of providing oral care for patients, these agreed with emotion literature and were plausible. Disgust and anxiety were examined in more detail, and other emotions of guilt and pride received less attention. The studies therefore achieved the objectives of identifying concepts but in view of the range of emotions identified, did not provide details for all of these experiences.

### **Discussion of the identification of nurses' and student nurses' perceptions of their roles and responsibilities towards patient oral care**

The focus group and interview studies examined nurses' and student nurses' perceptions of their roles and responsibility towards oral care and the emotions surrounding these. The focus group and interview studies showed that student nurses' roles and responsibilities in these studies were focussed on patients' wellbeing and their emotions reflected this. The concept of wellbeing is common in health care and psychology literature and care to improve wellbeing agrees with the literature (Locker and Matear, 2001, Gutierrez, 2005, Berry and Davidson, 2006, Leary, 2007, Galand et al., 2012) Although ill defined, the concept of wellbeing is well established and narratives have suggested that nurses' emotions may underpin care advocacy for patients and may influence care (Bird, 1994). The present

studies agree that student nurses' perceptions of their professional role and their ideas of what patient wellbeing is may influence emotions and this suggests that this influences the oral care provided for patients.

The present studies highlighted potentially fundamental issues for research exploring oral care emotions as a result of examining nurses' and student nurses' roles, and responsibilities towards oral care. These were differences in how health care workers used and interpreted oral care terminology, generic oral care questions and generic oral care situations. Care could therefore include toothbrushing or cleaning with swabs. When responding, even where participants felt the same role and responsibility, they could be considering quite different patients and care procedures.

The pilot and mixed methods studies in this thesis developed and tested oral care stimuli, scenarios and questions that could be consistently interpreted by student nurses. This approach diverged from conventional approaches of using generic questions in the oral care literature (Vanobbergen and De Visschere, 2005, Soh et al., 2011). These stimuli, scenarios and questions were then used in the pilot and mixed methods studies to explore student nurses' emotions and intended behaviours towards oral care. These studies agreed that emotions and intended behaviours varied in different care situations and this finding was corroborated with evidence of variations in emotion and behaviours in different environments and situations in the wider psychology literature (Deacon and Olatunji, 2007, Dorfan and Woody, 2011, Olatunji et al., 2012). Findings from studies in this thesis suggest that biased responses are possible where situations and terminology are not clear, specific or understood by participants. This evidence suggests that previous literature may have been subject to potential bias and corroborates the methods used in the present studies. The population under investigation in this thesis was however limited to a small population mainly comprising student nurses. Further studies of emotion, attitudes and oral care behaviours using this approach are recommended as a result of this research.



The focus group and interview studies indicated that oral care was considered to be potentially harmful. Similar concepts of harm, discomfort and anxiety when providing care have been seen in the literature (Berry and Davidson, 2006, Forsell et al., 2010, Jablonski et al., 2011a, Jobman et al., 2012). This suggests that although oral care has potential benefits, it is also seen to be a threat to patient and personal wellbeing, providing nurses and carers with reasons not to provide care. Participants described their roles as improving wellbeing. This meant that although oral care in general was described as being part of their roles and responsibilities, some procedures and even oral care could be beyond the nursing role. Concepts of appropriateness, time and wellbeing towards oral care in the present studies echo suggestions in previous work in relation to the barriers for oral care (Jobman et al., 2012, Rabbo et al., 2012, Unfer et al., 2012, Willumsen et al., 2012) and appear plausible. The clinical implications for the present study findings are that, where oral care is considered to be harmful, or crossing professional boundaries patients may not be receiving the oral care that they need. These have not been explored in detail previously. Professional perceptions of patient wellbeing and professional boundaries in providing oral care are therefore potentially important for patient care the present findings recommend further investigation. These studies therefore achieved the objectives of examining nurses' and student nurses' perceptions of their responsibilities towards oral care.

### **Discuss nurses' and student nurses' explicit and implicit emotions towards oral care and the relationship between these and oral care behaviours for adult patients**

As described, the studies in this thesis identified explicit emotions of disgust and anxiety and satisfaction towards the moral and physical aspects of oral care. Focus group, interview study and pilot interview findings suggested that participants were more likely to provide oral care for patients with unpleasant oral conditions although this was not seen in the mixed methods findings. The lack of a significant finding may be because few participants were unwilling to provide oral care. Disgust has been generally associated

with avoidant behaviours (Dorfan and Woody, 2011, Willems, 2011, Olatunji et al., 2012) and at face value; the present study findings appear to disagree with these reports. Implicit attention and moral emotions may however explain this. The present studies showed increased Stroop reaction times towards unpleasant oral care stimuli and implicit association tests agreed that implicit reactions related to disgust. Although previous studies have not examined implicit reactions towards oral care situations, similar reactions have been seen towards unpleasant stimuli in the general literature (Sawchuk et al., 1999, Charash, 2004, Huijding and de Jong, 2007, Charash and McKay, 2009). In agreement with these, present study findings therefore suggest that unpleasant mouths attract increased attention when compared to normal mouths. This implies that unpleasant stimuli may be associated with an implicit trigger or motivator for oral care.

The precise role of implicit emotions is difficult to determine as the findings in this thesis showed agreement between explicit and implicit reports of disgust in relation to physically touching and cleaning the mouth. Furthermore, agreement between implicit and explicit reports is not always found in studies (Hofmann et al., 2005). The agreement between these studies suggests that explicit and implicit studies were measuring some associated concepts, which appeared to relate to physical unpleasantness towards oral care. Physical unpleasantness and disgust have been associated with increased hygiene behaviour frequencies (Porzig-Drummond et al., 2009) and therefore relationships between reported disgust, implicit disgust and increased oral hygiene behaviours in the present studies agree with the literature.

Further findings in this thesis suggest that moral emotions may contribute to oral care. The mixed methods questionnaires showed stronger moral emotions towards the most unpleasant oral care situations. The present findings and this literature suggest that it is possible that nurses' moral feelings motivate oral care behaviours for unpleasant oral care situations. Although rarely considered in the oral care literature, moral emotions are considered to be relevant to nursing care (Crisham, 1981, Wurzbach, 1995, Bradshaw, 1999, Wurzbach, 1999, Esterhuizen and Kooyman, 2001, Tarlier,

2004) and moral distress has been demonstrated in relation to absent and inappropriate care (Raines, 2000, Gutierrez, 2005, Hamric and Blackhall, 2007, Zuzelo, 2007). These studies suggest that these emotions motivate ethical care behaviours. Therefore an unpleasant mouth may first attract attention and secondly it may generate a greater sense of needing to help. Furthermore, moral disgust and anxieties towards not cleaning and empathetic feelings were reported in the focus group, interview, pilot interview, questionnaire pilot, mixed methods questionnaire and mixed methods questionnaire interview study findings.

Despite these findings, moral emotions were not associated with care frequencies in the present studies. The studies in this thesis involved a total of 296 participants across all of the stages, of whom; most indicated that they were willing and able to provide oral care. Those who were not willing to provide oral care indicated that they took measures to ensure that patients received oral care. These reports were corroborated by positive general attitudes to oral care in the mixed methods studies. The measures for moral emotion and motivation in the present studies may therefore have been insufficiently sensitive in this population as most of their responses inferred moral emotions towards care. These findings therefore recommend further investigation of the role of moral emotions to compare the behaviours of those who feel morally bound to provide oral care and those who do not.

The literature has associated negative attitudes with oral care failures and these studies have assumed that negative attitudes cause an unwillingness to provide oral care (Furr et al., 2004). Evidence from the present studies suggests that care failures in hospitals (Terezakis et al., 2011) may also be attributable to student nurses who are willing to provide oral care. This is because the present study sample was willing and able to provide care, but pilot and mixed methods questionnaire studies suggested that not all patients would receive the same oral care. The present studies suggested that nurses willing to provide oral care would at times provide care falling below the necessary thresholds to maintain oral health (Axelsson and Lindhe, 1978, Axelsson and Lindhe, 1981). Care failures in hospitals may therefore

relate to care omissions and pilot findings suggest that these omissions may be associated with moral and physical emotional care experiences.

The mixed methods study showed that although student nurses felt morally motivated to provide care in the most unpleasant situations they also demonstrated reduced emotional motivation to provide care in normal oral health situations. The implication for this is that student nurses may not be as concerned about providing oral care for patients who they deem to be less urgent or in need. The resulting decrease in oral care may explain declining oral health for patients (Terezakis et al., 2011). In the interviews participants also reported less motivation to provide oral care for patients who were not their own. These findings echo reports in the wider literature relating to legitimacy of touching and interacting with the mouth and body in nursing (Sussman, 1978, Ingham, 1989, Edwards, 1998, Routasalo, 1999). These omissions may explain oral care failures in hospitals and therefore further investigations of care omissions rather than an unwillingness to provide care are recommended as a result of these findings.

The mixed methods studies show that although student nurses in the present studies intended to provide frequent oral care, in the most anxiety and disgust provoking situations, physical emotions of disgust and anxiety were associated with a decrease in the quality of oral care provided for patients. In these situations which evoked anxiety and disgust student nurses were more likely to be additionally gentle, or use swabs. On a clinical level, this means that care is likely to be less effective. As a result, patients with the worst oral health may receive more frequent care however this care may be less effective. These modifications of oral care behaviours in difficult situations may explain why studies improving attitudes towards oral care do not improve patients' care (MacEntee et al., 2007). These behavioural modifications have not been identified in previous studies of oral care however; studies of coping agree that individuals vary their behaviours in order to deal with difficult situations and emotions (Lazarus and Folkman, 1984, Folkman and Lazarus, 1988). Furthermore, theories of cognitive dissonance and emotion regulation also allude to strategies to reduce the

emotional discomfort of situations (Festinger, 1962, Gross, 1998, Gross, 2002) and the results of the studies in this thesis suggest that providing oral care in unpleasant situations is physically uncomfortable. Modifications and avoidance are therefore plausible. These findings recommend that emotional discomfort and changes to oral care behaviours to deal with this be further investigated.

The studies in this thesis examined relationships between explicit and implicit emotions and oral care. Explicit and implicit responses of disgust towards physical oral care stimuli agreed. This physical disgust was not associated with the failure to provide oral care but was instead associated with variations in care and modifications to the care provided. Physical disgust was therefore linked to poorer quality care. While physical disgust and anxieties, reduced the quality of oral care, studies suggested moral disgust motivated care. Disgust and anxiety towards the moral aspects of oral care were also identified and agreed, but no relationships were seen between moral emotions and oral care behaviours in these studies. These relationships were not examined in a wider nursing population. Relationships between other explicit and implicit emotions and oral care were also not examined in detail in this thesis.

#### **4.14.1. Future studies**

The present studies commenced with qualitative research, and models were developed for emotions towards oral care. The subsequent pilot and mixed methods studies then developed measures and examined emotions in these models. Many concepts in the focus group and interview study models were not tested in the subsequent studies for example; the setting and legitimacy of care, the initiation of care and concepts of “good care” were not explored in detail in the later studies. Current study findings suggest that in some situations student and qualified nurses do not reach the point of providing care. As not initiating care would affect care provision for patients, these findings recommend studies exploring the emotions and the care

environment, emotions and the legitimacy of providing oral care and emotions towards good care.

The present studies were undertaken in a localised area and later studies were focussed on student nurses. Studies in this thesis demonstrated that understandings of scenarios, images and terminology for oral care varied. The later studies developed and tested oral care stimuli with a population of student nurses. These were not examined in a wider population and were localised to a small sample which was predominantly female who had generally positive attitudes towards oral care, potentially limiting the generalizability of the findings and increasing the chance of bias. Qualified nurses and health care assistants provide the majority of oral care in hospitals and these studies showed that consistent stimuli were needed for oral care studies. Oral care stimuli will need to be developed and validated in these populations in order to explore emotions towards oral care in these wider populations. Furthermore, the studies indicated scope for improvement of scales for oral care frequencies and modifications to oral care procedures in the revised questionnaire. In addition, further development and validation of the revised mixed methods questionnaire is also indicated in line with questionnaire development practices. These studies therefore recommend further work to develop and validate the revised questionnaire used in the mixed methods study. A wider and more extensive population are also recommended.

The relationship between emotion and intended behaviours were considered in the present studies. Intended behaviours can be different to actual behaviours and these differences have implications for the care that patients receive. As a result, further studies to explore the relationship between emotion, actual and intended behaviours is recommended.

Participants in these studies were willing and able to carry out care, therefore findings do not account for individuals unwilling to provide oral care. Further investigations of the psychological and emotional issues for nurses who cannot carry out care may improve understandings and help to identify methods to help these nurses and are recommended as a result of this work.

The present studies showed that physical disgust and anxiety were related to changes to oral care practices with implications for the quality of patient oral care. It is possible that many care failings may relate to these care modifications and omissions. Therefore further work to examine behavioural avoidance and coping strategies in oral care and nursing are recommended in order to identify strategies to improve oral care for patients. Studies investigating these behavioural modifications in other areas of personal care are also indicated.

The present studies also identified moral emotions towards oral care and indicated that these emotions motivated oral care. Motivating oral care may improve patient oral health and an understanding of the motivation to provide care may also aide the improvement of care quality and standards in hospitals. These studies therefore recommend that these experiences are further investigated and the relationship between moral and ethical feelings and care should be examined in further detail.

As the studies in this thesis are ultimately for the purpose of improving oral care, further work to develop the studies for this purpose is indicated. It is possible that the work in this thesis could be used to help identify personal oral care training needs and be used in a tool for personalised training. Further investigation is recommended to explore this option. In addition, the impact of training and interventions to improve oral care on emotions were not examined in this thesis. These findings therefore suggest further stages of investigation to explore emotions towards training and oral health promotion in hospitals and changes arising from these.

#### **4.15. Conclusions**

The aims and objectives for these studies were met and an increased understanding of nurses' emotional experiences of providing oral care for their patients was developed as a result of these studies. These studies also uncovered the complexity of the emotional experiences involved in oral care and further investigations are recommended to explore these emotions and the relationship between these and care. These studies showed that

emotions are relevant to oral care and that oral care should be considered as series of events involving emotions and decisions with many opportunities for improvements in care.

The studies identified emotions of disgust, anxiety, and satisfaction as being relevant to oral care. Previous studies had alluded to these emotions as reasons for not providing care but had not explored these emotions towards oral care. The present studies demonstrated why these emotions were relevant to oral care. They also gave an explanation for the relationship between finding oral care unpleasant and poorer quality care.

The present studies also identified other emotions, for example pride and guilt but these were not investigated, as the main focus of the later investigations was moral and physical disgust and anxieties relating to this. Disgust was the main focus because it was the common thread through the studies. This emotion has illustrated the relevance of emotions towards oral care but these findings do not mean that it is more relevant to care than any other emotions.

The present studies also found that moral emotions were reported in relation to oral care. The moral motivation to provide oral care has received little attention in the literature however the present studies found that these moral emotions may motivate oral care. These moral motivators could potentially improve oral and general care in nursing.

The present studies have identified potential issues with previous oral care research and the relevance of situations to care. Situations, scenarios and terminology need to be carefully considered when reviewing the existing literature and when planning further studies of oral care. Beyond this, from a care perspective, differences in the interpretation of terminology means that oral care terms should be selected carefully for communication between dental and health care professionals.

Therefore, these studies have identified emotions relevant to oral care, which could potentially be harnessed to improve the quality of oral and general nursing care. Further work is needed to examine the relationships between



these emotions and behaviours and to explore how to use these to improve oral care.

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