Perceptions of Clinic-Related Stress Among a Cohort of Australian Third-Year Dental Students

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Abstract

Careers in health care can be highly stressful, in particular, those in dentistry. Dentists have one of the most stressful professions in public health care, struggling to manage dentist-patient relationships, time and scheduling pressures and other work-related factors. The combined effects of stress and job dissatisfaction on work and home life can cause dentists to become burnt out and contributes to many dentists leaving the profession prematurely. Similar effects appear in the dental student population, with many experiencing anxiety, depression, psychological distress and burnout. Previous research examining dental students' perceptions of stress has been predominantly quantitative. Therefore, it is important to undertake qualitative research to give voice to students' experiences, which until now have been lacking. Four focus groups with 21 third-year dental students from the University of Adelaide were conducted to explore students' perceptions of stress. In line with the research questions, common themes related to students' stressors, manifestations of stress, current stress management strategies and possible curriculum changes, were identified using thematic analysis. Tutors, patients, procedures, and demonstrating competency requirements were identified as significant sources of stress. Manifestations consisted largely of psychological symptoms such as decreased mental clarity, communication and sleep quality. Students reported a variety of useful and adaptive stress management strategies such as maintaining a healthy lifestyle, social support, and proactive preparation. Curriculum improvements suggested by students included improved tutor training and clarity about expectations and opportunities for formative practice. The implications of these findings and areas for future research are discussed.

Keywords: dentistry, student, stress, qualitative

Declaration

This thesis contains no material which has been accepted for the award of any other degree of diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.

September 2020

Contribution Statement

In writing the thesis, as the study is part of a larger research program, the ethics application was already written and approved at the beginning of my involvement, and the methodology had been selected. I conducted the literature search, collected the data via leading the focus groups with my supervisor acting as a scribe, and completed transcription of the focus group data. I was responsible for completing the thematic analysis of the focus groups with guidance from my supervisor and wrote up all aspects of the thesis.

Acknowledgements

I would like to sincerely thank my supervisor, XXXXXXXXXX, for her guidance and support throughout the year. I couldn’t have asked for a better supervisor. I would like to thank XXXXXXXXXX from XXXXXXXXXXXX who completed the ethics application for the broader project this thesis sits within, advertised the focus groups, and provided definitions for various dental terminology.

Thank you to my family who supported me throughout the year, from reading and editing sections, to providing useful advice in tackling the trials of the year.

Thank you to the third-year dental students who participated in the focus groups conducted, without your willingness to share your experiences and opinions that contributed to the primary research findings of this thesis, this would not be possible. I understand that your year has been severely disrupted by COVID-19 and wish you all the best in your future studies. Your dedication and responsibility you have for your patients is to be commended.

CHAPTER 1

Introduction

1.1 Overview

Careers in health care can be highly stressful, in particular, those in dentistry. Dentists have been found to have one of the most stressful professions in health care, struggling to manage relationships with patients, scheduling pressures and other work-related factors (Myers & Myers, 2004). The combined effects of stress and job dissatisfaction on work and home life can cause dentists to become burnt out, contributing to many dentists leaving the profession prematurely. Similar effects appear in the dental student population, with many experiencing anxiety, depression, psychological distress and burnout (Alzahem et al., 2011). While studies have explored stress in this population, most studies have sought to quantify stress and factors associated with stress, but have not focused on gaining qualitative data. Possible curriculum improvements and/or stress management interventions that could alleviate stressors have also not been discussed with students. This study, using qualitative methods, aimed to explore third-year dental students' stressors, how their stress manifests, their current stress management strategies, and curriculum improvements that could assist students to minimise and alleviate stress. The findings from this study will inform a broader program of research with third-year dental students which includes a quantitative survey, physiological measurements of stress in clinical situations, and piloting a stress-management intervention.

1.2 Process of Dental Training

A dentist, or dental surgeon, specialises in the prevention, diagnosis and treatment of diseases of the oral cavity (Merriam-Webster, n.d.). These individuals must have extensive oral knowledge and competency in the majority of dental treatments and procedures. Depending on

the country, after completing tertiary study, dentists are commonly registered with their local or national regulation body.

Worldwide, the process of dental training occurs at a tertiary education institution. Over several years, students gain skills in the prevention, diagnosis, and treatment of diseases of the oral cavity. High knowledge of oral techniques and procedures is required, alongside sub-millimetre surgical dexterity, and effective communication and interpersonal skills. Accredited courses vary between countries. In the United Kingdom and British Commonwealth countries like Australia, students can complete a Bachelor of Dental Surgery to become a qualified dentist (Australian Dental Council/Dental Council New Zealand, 2016). In contrast, in continents such as the Americas, Asia and Europe, students can complete a Doctor of Dental Surgery or Doctor of Dental Medicine (American Dental Association Commission on Dental Accreditation, 2020). Duration of these courses required to become a dental practitioner varies between 5-8 years of post-secondary study.

Generally, in the first two years of study (pre-clinical), students memorise information regarding topics, including, but not limited to, dental, clinical and behavioural sciences, clinical skills, and professionalism. Students engage in simulations focussing on the initial stages of patient care. Most often in the third and fourth years, students begin applying their skills to patients, members of the general public, in a supervised care setting. This stage aims to rapidly develop students' skills, founded in the first two years. Commonly, students have not been primarily responsible for the welfare, health and care of an individual before. For some students, this experience can be quite stressful due to the high degree of responsibility involved. Thus, frequently, the third year of training is viewed as the most stressful (Ahmad et al., 2011). The fifth and later years focus on refining students' skills before they enter the workplace. By now,

they have gained confidence in working with patients and concentrate on consolidating their clinical skills in procedures of increasing complexity where internships or placements are available.

1.3 Composition of Dental Students in Australia

The composition of dental student cohorts in Australia has changed over time. The dental student population at Australian universities is increasingly becoming comprised of students born overseas, primarily from Asian countries (Dobson et al., 1996), due to increased immigration (Mariño et al., 2006). In 2002, the average age of students was 22.2 years, where 56.1% were female (with 67.1% of international students being female), and most reported being single (Mariño et al., 2006). 46% were of Asian ethnicity, 30.2% were Anglo-Australian/New Zealanders, and 13.4% were of “Other” origins. International students comprised 10.4% of the population, with the majority being from Malaysia (30%), Singapore (21.4%), Canada (12.9%), and Korea (5.7%; Mariño et al., 2006). The majority of Australian oral health profession students (in the Bachelor of Dental Science and Bachelor of Oral Health Degrees) during the 2009-10 academic year were female (61.4%), single (91%), and of Asian ethnicity (65%) having an average age of 21.4 years (Mariño et al., 2012). In a recent study utilising Australian dental students (Stormon et al., 2019), the majority were female (57.5%), domestic (60.3%), aged 20-29 years (77%), and single (92.7%).

1.4 Definition and Epidemiology of Stress

An individual experiences stress when exposed to environmental demands that tax or exceed their adaptive capacity, resulting in biological or psychological changes that may increase the risk for disease (Cohen et al., 1995). Low levels of stress can improve biopsychosocial health and motivate an individual to achieve at their peak performance (Shahsavarani et al., 2015).

However, higher levels can be detrimental to an individual's biological, psychological and social wellbeing (Shahsavarani et al., 2015; Tucker et al., 2008). Occupational, or workplace, stress is the physical and/or psychological stress related to an individual's job, often arising when one perceives that their job demands exceed their abilities and/or resources (Shahsavarani et al., 2015). Workplace stress has been found to increase the risk of psychological symptoms and physical illness (Clarke & Cooper, 2004). Employees often require time off work due to workplace stress; accounting for a high proportion of workplace absence (Clarke & Cooper, 2004).

At present, individuals are more stressed than ever before. In 2017-18, the Australian National Health Survey reported that 1 in 5 Australians, or 4.8 million (20.1%), had a mental or behavioural condition, an increase from 2014-15 (4 million), due to the increasing reports of anxiety-related conditions and depression (Australian Bureau of Statistics, 2018). Increasing amounts of stress can lead to the development of a stress disorder such as Post-Traumatic Stress Disorder, Acute Stress Disorder or Adjustment Disorder (Gradus, 2017). Throughout society, the risk factors for stress are broad and diverse. The transitional nature of university life makes university students prone to stressors (Hamaideh, 2011). Commonly, sources of stress for university students related to course overload and academic evaluation pressures more than personal, familial, and social factors (Hamaideh, 2011). Depending on the circumstances, some university students must adjust to living away from home for the first time, without direct parental support. The new social environment of university can be stressful; finding new friends, and feeling comfortable in the classroom (Friedlander et al., 2007; Hamaideh, 2011). Maintaining a high level of academic achievement also brings unforeseen stressors; unclear assignments, homework, relations with lecturers and tutors (Clinciu, 2013). It appears that the

most common stressors for university students are self-imposed and come from pressures to achieve (Hamaideh, 2011).

In terms of workplace stress, a popular model seeking to describe risk factors is the Decision Latitude Model by Robert Karasek (Houtman & Kompier, 1995). The model comprises two main dimensions: job demands such as the amount of work, and the availability of possibilities for controlling these demands. According to the model, the most detrimental combination for an employee's health is high job demands and low availability of possibilities for control (Houtman & Kompier, 1995; Karasek, 1979). There is support for the model's predictive value for depressive disorders, psychological dysfunction, absenteeism, medication use, cardiovascular disease, musculoskeletal problems, and other health issues (Houtman & Kompier, 1995). Also, technology and knowledge changes in organisations can mean reduced holidays, lack of support, and role conflict leading to a more stressful workplace (Shahsavarani et al., 2015).

1.5 Impact of Stress for Dental Students and Professionals

Most dental students have been shown to experience emotional exhaustion and stress (Jiménez-Ortiz et al., 2019). The physical and psychological effects of stress on dental students have been linked to a variety of impacts. Reduced academic performance appears to be a significant consequence of stress, alongside burnout and mental illness related to decreased concentration, mood changes, and frustration (Crego et al., 2016; Elani et al., 2014). Higher levels of obsessive-compulsive disorders, anxiety and depression, have also been observed due to psychological distress (Basudan et al., 2017; Jain & Bansal, 2012). Students' physical health can also be impacted, causing loss of appetite, digestive problems and increased sick days (Jain & Bansal, 2012). Students are known to be tired and fatigued, and regularly experience headaches,

sleep disturbances, cold symptoms, and oral ulcers (Jain & Bansal, 2012). In extenuating circumstances, the stress from study can cause behavioural changes, such as smoking and substance abuse (Jain & Bansal, 2012).

Stress impacts not only students, but also the performance of their dental practice. Decreased concentration is especially detrimental when dental students are dealing with patients; their hands may shake, meaning they cannot perform minute and delicate procedures to the best of their ability (Basudan et al., 2017). Students' stress can also impact the stress levels of their patients. Patients with dental anxiety may become even more uncomfortable and unwilling to cooperate with the student (Jain & Bansal, 2012). Increased pain perception can be caused by anxiety and lead the patient to exaggerate that pain in their memory (Appukuttan, 2016). When treating anxious patients, students can become more stressed, as a patient becomes less cooperative and requires more treatment time, leading to an unpleasant experience. This can ultimately lead to a cycle as a stressed dental student becomes more stressed with an anxious patient who becomes more anxious.

Academic performance is incredibly important in dental school as being unable to perform at a high standard can lead to expulsion. From 2011-2018, a total of 40 students failed their third year in the Bachelor of Dental Surgery at the Adelaide Dental School (ADS), with each of these students failing the clinical component, highlighting stress during clinical placement as an impediment to their progress. As dental students are often highly critical of their abilities due to the responsibility they have to their patients, some have chosen to cease training of their own accord, changed courses or contemplated suicide (Bhayat & Madiban, 2017).

Previous literature has repeatedly identified the impending retirement of a large proportion of the current health workforce, particularly dentists, placing pressure on the medical

workforce (Schofield & Fletcher, 2007). Job stress is one of the most common reasons dentists retire (Schofield et al., 2010). For dentists, job stress usually arises from workload, patient-dentist relationships and work-related judgements (Song & Kim, 2019). Interviews with dentists regarding chronic sources of stress revealed six main categories of stress; time pressures, professional concerns, patient attitudes, staffing issues, treating patients, and business process stressors (Johns & Jepsen, 2014). Dentists have a high level of responsibility, as the outcome of a procedure is placed almost entirely on them. Dentists' job stress also affects their mental and physical health, where their job performance can sometimes lead to inadequate care of patients (Johns & Jepsen, 2014).

Suicide is an extreme response to stressors and can be a consequence of untreated depression or undiagnosed mental illness (Brondani et al., 2014). Dentists often have the highest rates of deliberate self-harm, such as suicide, amongst health professionals, and at rates seven times higher than the general population (Brondani et al., 2014). The 2012 New Zealand Occupational Stress and Job Satisfaction Survey revealed that all dentists surveyed knew a colleague who died by suicide (Jones et al., 2013). The most significant factor contributing to suicide for dentists is occupational stress (Jones et al., 2016). Their job is naturally client dependent, and interactions that are accompanied by discomfort, frustration, and hostility, contribute to the development of stress and potentially depression (Jones et al., 2016). Dentists are also less likely to take breaks during work and to go on holidays leading to burnout from unmanageable stress (Lange et al., 2012). In a survey of 437 general dental practitioners, the most commonly reported job stressors were treating difficult children, constant time pressure, and maintaining high levels of concentration (Ayers et al., 2008). Dentistry is often regarded by many academics as the "impossible" profession, as it is difficult for dentists to establish a

balance between work, family and personal time (Sancho & Ruiz, 2010). Their physical and mental health is significantly affected by the busy workplace where they must fulfil a daily list of appointments involving the handling of patients who hold the remuneration for dentists' work.

1.6 Existing Findings

A large body of literature has examined the sources and effects of stress on dental students and their perceptions of it. The most frequent perceived sources of stress come from the workload domain; examinations and grades, lack of relaxation time, completing clinical requirements, and fear of failing (Abu-Ghazaleh et al., 2011; Alhajj et al., 2018; Fonseca et al., 2012; Mahmood et al., 2019; Myrvold, 2017). Specifically, males have reported patient factors and academic overload as causing more severe stress, whereas females have reported fear of failure, examination and grading (Al-Samadani & Al-Dharrab, 2013). Females also tend to perceive more stress than males (Al-Sowygh, 2013; Babar et al., 2015; Divaris et al., 2014; Ersan et al., 2017). Sources of stress tend to change as students progress through their program (Alshammery & Aldahian, 2019).

In the period before students begin clinic work (pre-clinical), the primary sources of stress tend to be time strain, test frequency, heavy study material, problems with family, and health issues (Alshammery & Aldahian, 2019). After students begin clinic work, seeking patients, clinical requirements, and communication with staff (concerning opinions on procedures), become greater sources of stress (Astill et al., 2016). Although students deal with a variety of stressors in their education, they rate their overall quality of life as good. In a survey of 384 dental students completing the World Health Organization Quality of Life-BREF, the mean score for the physical health domain was significantly higher than the other domains, while the psychological domain had the lowest score (Andre, 2017). Further, psychological domain scores

were significantly lower for third-year than first-year students (Andre, 2017). These findings fit with the notion that dental students' stress often results from transitioning from pre-clinical to clinical learning, and clinical students consistently report a higher prevalence of severe stress compared to pre-clinical students, in particular, stress concerning patients (Bhayat, & Madiba, 2017; Elani et al., 2013).

The most frequently reported stressor by third-year students in a mixed-methods study was workload (Polychronopoulou & Divaris, 2009). Students highlighted feeling pressured when finishing requirements (such as finding specific patient cases) and that many factors outside of their control can influence their performance (Polychronopoulou & Divaris, 2009). Stress concerning patient treatment has been found to peak during the third and fourth years, alongside workload, and examinations and grades in the latter years (Polychronopoulou & Divaris, 2009). The first time third-year students perform dental treatment on real patients can be a particularly stressful experience (Alzahem et al., 2013; Sriram, 2016). Stress ratings for competition with peers, examinations and grades, and patients not arriving on time were particularly high (Sriram, 2016). Most students also felt moderately stressed about patient satisfaction and responded as moderately afraid when asked about the fear associated with patients (Sriram, 2016). As students progress through the clinical years of training, burnout becomes more prevalent (Reddy et al., 2014; Sriram, 2016). Dental students from two Jordanian universities reported high levels of burnout involving emotional exhaustion and depersonalisation, which is particularly critical as it could lead to patient negligence in treatment (Badran et al., 2010). Whilst these existing findings paint a picture of the broad stressors dental students experience, very little qualitative research describing their experiences has been conducted. In order to address this gap in the literature, the current study aimed to gather qualitative data regarding the stressors, manifestations of stress,

current stress management strategies, and possible curriculum improvements described by students; all areas that previous literature has only covered briefly.

1.7 Current Research Aims

Dental students beginning and progressing through the clinical components of their program are clearly at higher risk of procedure- and patient-based stressors. These stressors can impact their academic performance, and physical and mental health to the point where some fail their course, drop out or contemplate suicide. Previous research determining third-year dental students' perceptions of stress has been almost entirely quantitative and, hence, qualitative data where students express their experiences in their own words have been lacking. Therefore, to address this gap in the literature, using qualitative methods, this study aimed to explore third-year dental students' perceptions of stress, through the following research questions: 1) What do students find stressful? 2) How does stress manifest for students? 3) What are students current stress management strategies and 4) What curriculum or curriculum delivery changes could assist students to decrease and/or better manage stress? The findings from this study will inform a broader program of research with this population which includes a quantitative survey, physiological measurements of stress in clinical situations and piloting a stress-management intervention.

CHAPTER 2

Method

2.1 Participants

Participants were 21 third-year dentistry students enrolled in the Bachelor of Dental Surgery (BDS) at the ADS, University of Adelaide; 7 males and 14 females, aged 20-32 years (M = 22, SD = 2.61). Individuals were eligible to participate if undertaking their third year of study in the BDS at the ADS and fluent in English. Most participants identified with Asian ethnicity, were single, currently lived alone, and were not currently employed. Fourteen participants were domestic and seven were international students. Table 1 provides a summary of participant characteristics.

2.2 Procedure

The University of Adelaide Low Risk Human Research Ethics Review Group (Faculty of Health and Medical Sciences) approved the study (approval number H-2019-192). During a BDS class, students were informed about the study and were given a Participant Information Sheet (Appendix A) and Consent Form (Appendix B). Those interested were encouraged to contact the researchers and return the consent form. After assessing eligibility, participants were contacted to schedule a convenient time for them to attend a focus group.

Focus groups were conducted to gather information about participants' perceptions of stressors concerning clinical practice, manifestations of stress, current stress management strategies, and ideas on curriculum or curriculum delivery improvements that could minimise or alleviate their stress. Data from the focus groups will also inform a broader research program that includes a quantitative survey, physiological measurements of stress in clinical situations and a stress management intervention for dental students. Participants were advised that participation

Table 1: *Summary of Participant Characteristics*

Focus Group	Age	Gender	Birth Country	Ethnicity	Relationship Status	Living Arrangement	Student Type	Current Employment
1	24	Male	Australia	Philippines	In a relationship	Share House	Domestic	None
1	20	Female	Australia	Middle Eastern	Single	Alone	Domestic	None
1	22	Female	China	Asian	Single	With friends	International	None
1	21	Female	Malaysia	Asian	Single	With friends	International	None
1	22	Female	Malaysia	Asian	Single	With family	International	Part Time
2	20	Male	Australia	Australian, Asian	In a relationship	Alone	Domestic	None
2	21	Female	South Korea	Asian	Single	Alone	Domestic	None
2	22	Female	China	Asian	Single	Share House	Domestic	Part Time
2	20	Female	Australia	Asian	In a relationship	With family	Domestic	None
2	23	Male	Malaysia	Asian	Single	With friends	International	None
2	21	Female	Australia	Asian	Single	With friends	Domestic	None
3	22	Male	Singapore	Asian	Single	With friends	Domestic	None
3	23	Female	South Korea	Asian	In a relationship	Student accommodation	Domestic	None
3	24	Male	Canada	Canadian	In a relationship	Student accommodation	International	None
3	22	Female	Australia	Asian	Single	Alone	Domestic	Part Time

4	20	Male	Australia	Asian	In a relationship	Share house	Domestic	None
4	32	Male	Canada	Asian	Single	Alone	Domestic	Part Time
4	26	Female	Canada	Sikh	Single	Alone	International	None
4	23	Female	Malaysia	Asian	Single	Student accommodation	International	None
4	22	Female	South Africa	African, Asian	Single	Alone	Domestic	None
4	21	Female	Australia	Australian	In a relationship	Share house	Domestic	Part Time

was voluntary and that their decision regarding participation would not affect their ongoing studies at the University of Adelaide. Participants could choose not to answer any questions and to withdraw from the study at any time until the end of data collection.

Focus groups, consisting of 4-6 students each, were undertaken face-to-face in a private room at the University of Adelaide in March 2020. The researcher led all focus groups with the research supervisor present to assist with note-taking. Focus group questions and prompts were reviewed by the researcher and research supervisor following each group, so adjustments could be made for future groups if necessary; no questions were added or removed. All focus groups were audio-recorded and ranged from 1 hour and 10 minutes to 1 hour and 45 minutes (M = 1 hour and 24 minutes). Data saturation, no emergence of new information or themes, was reached after four focus groups.

Demographic information including, age, gender, country of birth, ethnicity, relationship status, living arrangement, education, student type (domestic/international) and employment status, was collected from participants before each focus group (Appendix C). Focus groups were semi-structured using open-ended questions and employed a topic guide (Appendix D) to detail the main questions and prompts. Example questions include, How do you feel when you think about seeing patients in clinic?, What aspects of clinic cause you the most stress/worry?, Can you describe what causes you to feel stressed/worried about clinic?. Other examples include, What techniques do you use to manage stress in your every-day life? And How do you manage your stress in relation to clinic?

Focus groups were transcribed verbatim, including all verbal utterances. Confidentiality was maintained by assigning each participant a pseudonym and removing all identifying information from the transcripts.

In recognition of Tracy's (2010) emphasis on the importance of acknowledging a researcher's potential impact on the research through their personal biases, the researcher engaged in self-reflexivity. The practice of self-reflexivity allows for honest and transparent self-awareness. The researcher is a young male who has no dentistry knowledge or experience other than as a consumer and has not studied the BDS at the University of Adelaide. During data collection, unfamiliarity with dental terms and procedures may have led to misunderstandings between the researcher and participants. However, transcription provided the opportunity for the researcher to seek further information to increase his understanding of such details. Many participants stated that having the focus groups conducted by researchers external to the ADS allowed them to feel more relaxed and to provide more honest responses.

It is noteworthy, that when the focus groups were conducted, the world was on the verge of the COVID-2019 pandemic. At the time of data collection, between March 5th and March 12th 2020, it was not known how severely Australia would be affected by COVID-19. At this time, Australia had yet to enforce social distancing restrictions countrywide. University classes were still being taught face-to-face, and participants in this research were still providing services in dental clinics. Therefore, COVID-19 is thought to have had a limited impact on the data collected.

2.3 Data Analysis

Data were analysed using Braun and Clarke's (2006) widely accepted six-step qualitative analytic method of thematic analysis. Data familiarisation involved transcription of the focus groups, repeated reading, and taking notes of initial ideas. Initial codes were then generated by identifying and organising interesting features. Codes were then sorted into potential themes and sub-themes. Themes were then refined in relation to initial codes, the entire dataset, and the

research aims. Next, the themes were defined and further refined. Finally, extracts illustrative of the themes were chosen. Codes and themes were also cross-checked with the research supervisor to ensure clarity, consensus and trustworthiness as per Braun and Clarke’s (2006) recommendations.

CHAPTER 3

Results

3.1 Overview

The results are categorised into four sections, aligning with the research aims (see Figure 1 for a thematic map). Specifically, Section 3.2 presents findings about stressors experienced by students, Section 3.3 describes findings concerning how stress manifests for students, and Section 3.4 details their current stress management approaches. Finally, Section 3.5 discusses findings relating to improvements in curriculum design and/or delivery that may be beneficial in minimising stress.

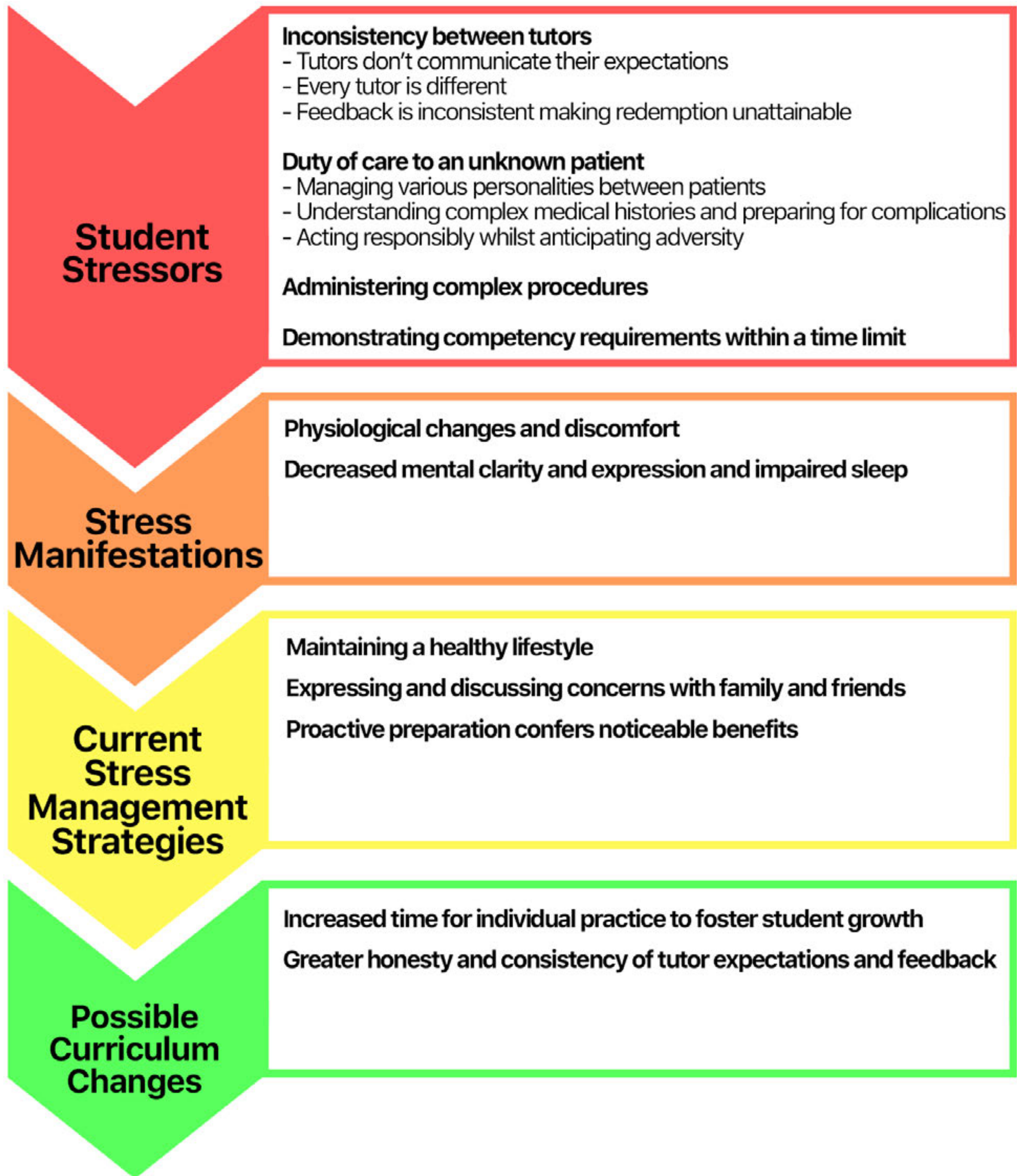

Figure 1: *Thematic Map*

3.2 Stressors for Students

3.2.1 Inconsistency between tutors

Across the sample, inconsistency between aspects of tutors' personality and conduct was identified as a theme. Within this, three subthemes were identified; 'Tutors don't communicate their expectations', 'Every tutor is different', and 'Feedback is inconsistent making redemption unattainable'. Most students felt that tutors' expectations during clinic were unrealistic, and not communicated. Tutor feedback also varied.

3.2.1.1 Tutors don't communicate their expectations

Students [redacted] described tutors placing expectations upon them to achieve at a high level. When conducting dental procedures on patients, some students felt they were expected to be able to perform a specific procedure without having practised it before:

> *"It's one step, but it's a really important step that we haven't really practised yet, but we're expected to be able to do, um and it's something that can really affect the patient, so things like that, things that we haven't prepared for but we're expected to know."* ([redacted], Focus Group 1, Lines 745-748)

Further, due to the number and variation of tutors, several students reported tutors having different ways of performing the same procedures. This variation was seen as problematic because students were expected to conduct the procedure in tutors' preferred style without necessarily knowing what that style was:

> *"Each tutor kind of has their own way of doing things, so you don't know until you like make a mistake, or like until they ask you, so they've been doing it for so long, so they just expect that of their students, whereas we don't know anything about them, like one tutor might want to do uh a list of things completely different to the next tutor."* ([redacted] Focus Group 2, Lines 690-694)

Stress concerning tutor expectations also resulted from hearing other students' experiences. Such observations led students to question whether they could meet tutor expectations:

> *"On Wednesday, I have like a pretty strict tutor and um, and then um hearing like kind of the feedback he gives to other people, and then because I'm a student learner as well, just hearing all that just actually added a bit of stress, because like I could kind of ascertain what his expectations were, so now like, now I'm thinking oh Wednesday I get more stressed for the session because I it's because I already like I've already established what my tutor wants, but um it seems as though like people can't reach that expectation in my group, so it makes me question whether I can as well and that's just a bit of stress I think um to the situation, and it's because, and it's not only me but it's like a lot of people in my group as well feel that they can't, you know meet that expectation."* (Focus Group 2, Lines 1352-1362)

Summarised by , the variation in tutor expectations can leave students feeling unprepared and stressed coming into clinic:

> *"When you don't know their expectations, you're, you're trying to kind of, you're trying to guess what they think of you, what they think you're at, and that's where the stress comes in a bit more."* (, Focus Group 3, Lines 1185-1187)

3.2.1.2 Every tutor is different

Alongside expectations, many students recognised other differences between tutors that also influenced their stress levels. Among students at the ADS, some tutors have generated a reputation for regularly failing students. Tutor reputations and differences contribute to students' mood:

> *"Some tutors have a reputation for like a huge fail rate and then some of them are like, just, you just pass, so like I have a, I don't know, pretty strict tutor and like that really stresses me out, like on Mondays, and then on Wednesdays I feel a bit more calm, so yeah it's a bit, cause their standards are really varied um across tutor groups so that plays a huge role."* (, Focus Group 2, Lines 238-243)

Some students identified that grading varied greatly between tutors, often hinging on the tutor's personality or mood during clinic which was unpredictable:

> *"Their critique of your work is based on how they feel that day, and you don't know how they're going to feel that day."* [redacted], Focus Group 4, Lines 618-619)

The wide variability between tutors made some students question inter-rater reliability, leading to unpredictability in grading:

> *"I feel like if I had my restoration and I showed like the tutor sitting across I'd get a completely different grade."* [redacted], Focus Group 3, Lines 1609-1610)

Many students expressed that the support they receive during clinic also depends on the tutor, and to some extent, the tutor's personality. When students seek some reassurance that they are performing well, tutors give no indication:

> *"Some of the tutors, it's really hard to read them like you don't know if they're happy with you or not, like they just have the same facial expression with everything, so like I don't know if like, they're happy that I did this or they're not happy, and they don't really say oh you did well in this case or whatever like they only kind of say the bad things, or like what you need to improve on, but they don't say oh you did a good job, um but other tutors are, it just depends, like um one of my tutors is really caring and like cause I got to sim clinic really late and then she like tried to make sure that like I ate and everything like if I needed anything I could just like go outside and eat even though I had like an assessment to do um, so just like being caring and encouraging is the biggest thing."* ([redacted] Focus Group 2, Lines 1395-1405)

An unsupportive tutor can make clinic, an already stressful scenario due to the many factors students must manage, an increasingly arduous experience:

> *"I think what helps with that is like a supportive tutor, like I've heard some people that don't get as much support um from their tutors can get quite stressed."* ([redacted], Focus Group 1, Lines 405-408)

3.2.1.3 Feedback is inconsistent making redemption unattainable

Receiving feedback was identified by most students as a stressful experience, especially since tutor feedback varied from no feedback, to extremely critical. After working hard in clinic and receiving critical feedback, students described feeling discouraged, and stressed about future clinic sessions:

> *"If your tutor was really harsh on you in that session, and then he told you like, you did this wrong, you did this wrong, you did this wrong, you need to review this, you need to review this, yeah definitely you're going to leave clinic feeling pretty stressed out about for the next session."* (█████, Focus Group 2, Lines 572-576)

Some students also noted that sometimes there is a disconnect between how their tutor said they performed, and the written feedback they receive which can create confusion or doubt:

> *"Sometimes tutors will sort of say, or they don't really say anything, or they say it's really good, and then on your feedback form it's like oh ok, like you just did ok, and then like it's sort of different to what they're saying um, and that can be like, you just have no idea why they wrote that, or you thought you did better than you did."* (█████, Focus Group 2, Lines 674-678)

In some instances, tutors voice their feedback to a student during a procedure, causing the patient to lose confidence in the student. This, in turn, adversely impacts the student's confidence, and increases their stress levels:

> *"If the tutor makes it really obvious that you missed something, and then your patient hears, and they start to doubt your ability."* (█████ Focus Group 2, Lines 547-549)

Overall, receiving feedback is a stressful experience for students. Concerns about missing something important are particularly stressful:

> *"A big thing is um I'm always worried about like missing something obvious in a mouth, and then the tutor will be like, 'oh like what do you see here,' and I'll say, 'well I see,' but they'll be like, 'oh why didn't you see this,' or um 'yeah did you not like check clearly,'*

and they'll think I had like inaccurate information like clinical observations, so I guess that's the main thing like missing things in the mouth that they'll pick up." (■■■, Focus Group 2, Lines 527-533)

3.2.2 Duty of care to an unknown patient

Across the sample, a sense of responsibility to diverse patients was identified as a theme. Within this, three subthemes were identified; namely, 'Managing various personalities between patients', 'Understanding complex medical histories and preparing for complications', and 'Acting responsibly whilst anticipating adversity'. The patient's personality can have a significant effect on the consultation, influencing students' stress levels. Students must meet the needs of patients from diverse backgrounds with varying degrees of health. A medical emergency is also possible when the medical history of the patient is relatively unknown.

3.2.2.1 Managing various personalities between patients

Students care for a variety of patients in clinic, each with a different personality that can make the session stressful. The unknown personality of a patient can increase stress levels in many students leading up to their first interaction with their patient:

> *"A bit of uncertainty about um, what we'll see in the patient's mouth but also just, whether we'll get along or, like whether they're happy to, the type of person who's happy to answer all your questions."* ■■■, Focus Group 3, Lines 309-311)

The rapport between patient and student is important for clinic to progress without incident. However, the patient's personality dictates how quickly and easily rapport can be established:

> *"I like kind of find stressful is um how well you rapport with the patient cause um how well you interact with the patient and how comfortable you and the patient are kind of affects the whole session and like the dynamic of the session so uh with my first patient I guess, it's kind of like hard to rapport with him so I kind of felt like not uncomfortable but um I found myself like wishing like oh like I wish it was a bit like nicer or like talked a bit more um so I didn't feel great after the session because of the um, the rapport."* (■■■, Focus

Group 2, Lines 735-742)

The variability of patients' personalities can also bring unforeseen interactions where students expressed feeling uncomfortable or embarrassed. For example, ■■■■ noted feeling bad when patients were mean:

> *"It's been really awful this year actually but then at the same time um, you kind of get worried that oh what if this patient is like, this kind of personality then, how would you manage it would I be able to manage it, cause like, there were VPP [Volunteer Patient Program] sessions that kind of, failed when I, like when I was doing it cause like, it just got out of my hand and you're like, being too mean."* (Focus Group 3, Lines 589-594)

Receiving dental care can make some patients feel uncomfortable, especially those who have had a bad experience previously, and experience dental anxiety. Therefore, students must take extra care to ensure patients feel comfortable during the procedure; another factor to manage, further increasing stress levels:

> *"Especially when you're using like local anaesthetic, patients are already nervous about getting one needle if you're taking too long you're going to need a top up so you don't want to tell you patient oh well I took too long so now I have to give you another needle, they're not going to be happy with that, even if somebody isn't scared of needles you just don't want more needles."* (■■■■, Focus Group 1, Lines 337-342)

A few students feared treating cigarette smokers, as they would have to confront their patient, who may become irritated, about quitting in order to maintain oral health:

> *"The smoking thing actually gives me a little bit of anxiety every time I come to that question because when we had that, PCC [Patient Centred Care] tutorial last year and the actor, that I had she actually got very offended, when I asked her about smoking and a follow-up question was have you ever considered quitting, and she freaked out, and it was not like, her acting anymore it was actually her cause she came up to me after and she's like so are you BOH [Bachelor of Oral Health] or BDS [Bachelor of Dental Surgery] and, she was offended that I asked."* (■■■■, Focus Group 4, Lines 501-507)

With smoking comes the possibility of developing cancer, which could make the interaction very serious with the potential for an emotional reaction from the patient. The possibility of having to inform patients about cancer is daunting for students still in the early stages of their training:

> *"I know my first patient he was like a 20 a day, smoker for like four years and I was really concerned about cancer, I was like what if I find something and I have to tell this person that they have cancer."* (, Focus Group 4, Lines 301-304)

Inevitably, clinic brings about many unknowns that students must manage, with the varying personalities of patients being difficult to endure.

3.2.2.2 Understanding complex medical histories and preparing for complications

When patients come into clinic, students must understand their medical history to provide the care required. Often patients' medical history contains significant comorbidities that students must be aware of during procedures. When faced with potentially life-threatening medical complications, most students described pressure to perform to the best of their ability and not add to medical issues:

> *"I think um, preparing for the patients, stresses me out a little bit, just because when you're looking at their histories and stuff, you can see that, there's so many things that has happened to this patient and then it's just like, um I think I put like a higher expectation on myself to do like, to, to get this patient in and like um, help them out um, cause there's so many things that's going wrong for this patient's life. Um yeah I think, like I need to do this, to the best of my ability because there's already so many things going on for this patient, I don't want to add anything onto that."* (, Focus Group 1, Lines 472-479)

Although students can prepare for complex medical histories before clinic, they reported feeling overwhelmed when discussing these with patients, where the history is even more complex than they had anticipated:

> *"I think like going into it is very different to like when you're in it, because when you're going into it you've prepared everything you can prepare and that's fine, so it's only when*

like you hit like a huge like 10 medications and suddenly you're like oh ok this is completely new and then you may not be so comfortable anymore, so when you get those unfamiliar territories, yeah you get a bit more uncomfortable." ███, Focus Group 3, Lines 1148-1153)

Students also feared the possibility of patients experiencing a treatment-related reaction such as an allergic reaction or seizure, where they would be responsible for providing appropriate care. Even if students feel prepared to face an extreme circumstance, they expressed concern about their patient management, and how they would handle allergic reactions:

"All of a sudden something unexpected were to happen on the chair, where at some point if the patient were to undergo an epileptic seizure and like of course you regret like the management of that epileptic seizure but then like all of sudden you see it for the first time with your eyes." (███, Focus Group 2, Lines 438-442)

The complexity of some patients' medical histories can increase students' stress levels as they scramble to understand all of the previous procedures the patient has undergone, and the patient's current medications, including side-effects. Additionally, students are concerned about making the correct assessment in preparation for tutor questioning and grading:

"My first other patient … I took an hour to do the history uh like all the medical and dental cause they hadn't been to the dentist in 30 years and um he had like I don't know like how many operations and how many medications he was taking … its a different thing like when your tutor actually comes around asks you ok now what's the class of the medication he takes, what are the oral implications um have you checked for it yet and like um when you go through that many medications and that many conditions you just feel really overwhelmed because um when you actually go to then look into the patients mouth you're looking for you know the signs of like side effects or anything … when you throw in too the factor of like a patient has these medical conditions and you should actually address looking at if they have side effects it just kind of throws of your game I think and that is pretty stressful I think because um especially when your tutor does come round to check

> *and he's checking other things that you probably, that didn't come, to mind for you it just makes you feel like you haven't, you're not quite up there to the standard that you should be and I think it's, it's disappointing."* ([redacted] Focus Group 2, Lines 450-476)

Students have numerous factors to consider during clinic, with patient care being one of the most significant where misunderstanding their medical history can have serious consequences.

3.2.2.3 Acting responsibly whilst anticipating adversity

Struggling with the various personalities and complex medical histories of patients comes full circle when considering the responsibility and duty of care students have to their patients. Due to the cliental that the clinic attracts, students understand that their patients are preoccupied with many other things in their life, and thus do not want the care they provide to waste the patients time or make the patient feel uncomfortable:

> *"I don't want to cause them discomfort I also don't want to discourage them from coming back, to receive the care that they, probably need."* [redacted], Focus Group 3, Lines 575-577)

Most students placed a high level of responsibility on themselves to perform optimally as they understand that their patients are often struggling through hardship. They described understanding the responsibility to their patients now, and in the future when they are a qualified dentist. However, they noted this creates pressure to develop their clinical skills as much as possible during university:

> *"I don't want to be a dentist in the future to just have like a, like a decent job … I don't want it just to be satisfactory … this is someone else's tooth, this is someone else's health. I want it to be like the best that I can give this patient … that is something that plays in the back of my mind … when we had PCPC [Preparation for Comprehensive Patient-centred Care] like pre-clinical um we were able to do like a few fillings and after not touching like a hand-piece or having to do a filling for so long, coming back and then having a tutor tell me that my work needs to be improved upon but then knowing that I'm going to be seeing a*

patient in like 2 weeks time was super stressful because I was like if I can't pick up all of my skills now and like if I can't pick myself up and be able to do a decent restoration I don't want to do it on like a person that you know, with that stress of like oh it can be a semi-decent restoration like semi-decent filling but it's not going to be good, good, that stresses me out that I can't provide that quality of care to somebody." (█████, Focus Group 2, Lines 391-406)

3.2.3 Administering complex procedures

Due to the complexity of patients' medical histories, students are often required to conduct intricate procedures requiring fine motor control and a calm patient. However, treating a patient brings about many factors that are not present during simulation clinic. These can increase students' stress levels, making it much harder for them to conduct procedures:

"We've been doing oral examinations so like check ups, and like you tell the patient to turn their head like a certain way and like they'll turn it for like 30 seconds and then they'll slowly like it's fine because it's an oral examination like you're not actually drilling or doing anything invasive but when you're actually like making a cavity or whatever and you're, you've got something sharp in your hand like what if they move or they, I don't know just thinking of those types of things that's all stressful." (███, Focus Group 1, Lines 758-765)

Sometimes procedures cause patients to feel slight discomfort, and a physical reaction to the treatment can increase students' stress levels:

"If the patient flinches at any point, suddenly my stress like jumps, yeah, even though, like ok that's not great, because if you're like perioprobing they would be flinching like, um every couple seconds if they're like really inflamed but, um still I can't help but be stressed." ████, Focus Group 3, Lines 567-571)

Many students described fillings as a procedure that can be quite stressful, especially since they had only just started practising in the simulation clinic, but are expected to perform them if necessary in clinic:

> *"So like when we start doing fillings, I mean we can only technically do fillings and cleaning and but I feel like fillings are probably going to be the most extensive procedure that we do this year um I am nervous for that because we haven't done it on like an actual patient yet."* (█████, Focus Group 1, Lines 714-717)

Restorations are another procedure that many students find stressful as they involve anaesthetising the patient, which has its own timeframe. If students take too long, or the patient is not successfully anaesthetised, they will have to try again, increasing their stress level:

> *"restorations we've never done it on people … we have to do like an IAB [Inferior Alveolar (Nerve) Block] like … we have to anaesthetise the person and we've only done it with like friends … if we miss for example … we just kind of briefly like skip over or we can have another go but actually telling a person, oh you're not successfully anaesthetised we might have to give it another go I think would be much different um in real life and just uh knowing how to manage situations I think it's not something we're, we're like really exposed to … so it's much harder than I think, we think it will be … I think it's a worry at the back of your mind um just like any restoration."* (█████, Focus Group 2, Lines 789-799)

3.2.4 Demonstrating competency requirements within a time limit

Clinic is the primary location where students must demonstrate their learning and apply it to real patients. However, certain requirements students need to meet often increase stress levels, especially when they are under a time limit. There are competing demands; students want to do their best for their patient but have limited time to do it in order to be assessed favourably:

> *"Stress is that always like I want to like all double check but there's time constraints so I'm like oh I have to get this finished at this time but then at the same time I'm stressed cause it's like what if there's something I've missed that's very important and that is like yeah part of the patient management."* (███████, Focus Group 1, Lines 267-271)

Some students also feel pressure and subsequently doubt their ability as they see others around them progress further and faster through consultations than themselves:

> *"I would always set up kind of like a time like ok so I want to spend 30 minutes here, 10 minutes here this kind of thing but when you, when you start looking at the time and it's like you're nowhere close to finishing that's when the stress really kind of piles on and like everyone, you see everyone else kind of moving onto the next stage and you're still here and you're like, you're still just asking questions, you haven't even put on your gloves yet like you're not even there it's like that's when the stress really builds on and it's like your tutor knows as well it's like is he thinking that you're slow it's like, you start really doubting your capabilities at that point, um that's when I'd say definitely its stressful to happen during clinic"* , Focus Group 2, Lines 535-545)

Time limits, while a necessary skill to develop for future practice, are especially detrimental when students are partway through a procedure, check the clock, and subsequently panic. Students feel a responsibility to their patient to finish the procedure, while also worrying about finishing on time, increasing their stress levels:

> *"That's something that really freaks me out like you're coming towards the end of a session, you're just carving, you're carving your amalgam restoration, you over-carve it a little bit and then it's not ok for the patient to just like, to just leave, it's like when, how like what am I going to do in that case of like, I need to take out this entire thing again and start all over but I don't have time left."* (, Focus Group 2, Lines 868-874)

When struggling to finish consultations on time, clinic reveals to students how limited their knowledge is. As they meet patients and begin procedures, they worry about the consequences their limited knowledge could have for patients:

> *"I mean obviously there's an underlying stress cause you want to provide the best care that you can to your patients, but at the same time you feel very incompetent in my case I'm like, my knowledge is very limited, there will be like things that I miss, and like obviously like, tutors there to help you but at the same time since we get graded, it's like, like you like, even if you were to not know things sometimes, you're like tempted to just like conceal it so just in case of like if it was to affect your, performance like what they think of you."* (Focus Group 3, Lines 255-262)

█████ description of the many factors students worry about during clinic was representative of sentiments expressed by other students. Alongside time concerns, students worry about the health of their patient, and the grade they receive for that clinic session hinging on their knowledge:

> *"When you have a patient that has like 20 different medications like or has like a lot of medical problems… I think every student can understand how your tutor will ask you basically every single medication … the more the worry is actually just if one of these things goes wrong will I be knowledgeable enough to be able to keep my patient under a safe environment … I think it really hits you that this patient is under your care so if anything happens… you're in charge of, sure you have your tutor and everything, a but they're still under your care … when I see a patient with lots of medical conditions it's like not really the fact that there's all these medications I've got to keep aware of, it's the fact that if I'm not aware of it, and there's consequences do happen, I have to be responsible for that … you can't really reduce that kind of stress cause it's something that is just always there and you hope it never happens but if it does happen you, are you able to take care of it … can't really manage if you wanted to."* (████, Focus Group 2, Lines 412-432)

3.3 Manifestations of Stress

3.3.1 Physiological changes and discomfort

Many students mentioned physiological changes they experience during clinic due to stress. An increased respiration and heart rate were among the most common changes discussed:

> *"I think my heart rate goes up, and then it's always like, it's almost a little bit like kind of difficult to breathe like it's not so much like an attack or something, but yeah you're just like oh my goodness like sometimes you kind of forget to breathe in a sense like you're kind of holding your breath."* (████████, Focus Group 2, Lines 1011-1014)

Flushing or feeling hot was a symptom identified by some students as an indication of physiological changes:

> *"I can feel it in clinic that my heart rate goes up like even though it's winter when I walk into clinic and then I just immediately feel why is the clinic so hot today and then I just start like flushing."* (■■■, Focus Group 1, Lines 846-848)

Students must wear protective equipment during clinic such as a mask, goggles, and gloves. An increased respiration rate causes students' goggles to fog up, providing them with a visual indicator that they are stressed:

> *"I feel like there's like blood like more flowing to my face and kind of flushing, and like my glasses like tend to fog up."* (■■■, Focus Group 3, Lines 680-681)

Conducting a procedure while looking through foggy goggles is discouraged given that it can be hazardous when having sharp instruments in or around a patient's mouth:

> *"That is like one of the things that add up to your stress they're not supposed to have your goggles fog up."* (■■■, Focus Group 1, Line 867)

Some students experience their stress manifesting through their hands shaking. This can be especially dangerous when treating patients as fine motor control is required to perform some procedures:

> *"I shake which is not good as a dentist, um and then I, like if I get really nervous like my hand will wobble, and I'm like what the fuck stop doing that and then it does it more and I'm like oh no."* (■■■, Focus Group 4, Lines 701-703)

When some students noticed this, their hands shake more; their awareness increased the shaking and distracted them from the procedure, and adversely impacted their performance. A few students identified that their hands shaking was the first problem, which escalated and led to more problems:

> *"Like your hands are shaking obviously you won't be able to turn on like, manipulate instruments correctly um, you'll probably like fumble over the patients face and um it'll just make you more stressed like once you, once things goes wrong, goes wrong and you'll just be more stressed and then you won't be able to like perform procedures correctly."*

(█████, Focus Group 2, Lines 1166-1171)

3.3.2 Decreased mental clarity and expression and impaired sleep

Many students reported experiencing psychological manifestations of stress more frequently than physical manifestations. Forgetfulness was a common difficulty for students. During clinic, students are required to progress through many procedures, such as discussing medical history and preparing instruments. Stress often impacts students' mental clarity making it harder to move through procedures in a systematic manner:

> *"When we're doing like, uh a nerve block when we're giving local anaesthetic ... we've been taught to do things in a set way like ok you've got to uncap the needle and then you need to make sure you need to ask, you need to do all these things, you need to make sure your hand is here, make sure you bring it across like the patient so, so they don't see, you need to have your other hand over here that like, when I'm doing something like that, that's all that replays in my mind and you don't even think about like, oh I should be telling the patient they shouldn't be stressed out right now like cause I'm so stressed out about like ok you need to do step 1, step 2, step 3 in this, in this sequence that yeah, 100% you just forget that there's a patient lying there ... you just kind of like zone so much into what you're doing that you just totally forget about the communication part."* (█████, Focus Group 2, Lines 1144-1156)

Students' increased stress levels, alongside the large volume of information they are required to process, are detrimental to their performance. Students can miss actions or perform them in the wrong order, which can impact their patients or subsequently lead them to be penalised:

> *"I think for me it's sort of similar like I usually have a flow in my head and when I get stressed I think the flow gets mixed up, so then I tend to miss certain things or do certain things."* (█████ Focus Group 4, Lines 866-868)

With all the factors students have to manage during clinic, time pressure, specifically, causes stress levels to increase quickly. In these situations, time pressure causes students to rush and miss important steps:

> *"My patient came in like 40 minutes late, and so like we were very behind and he was also very chatty, and so I was feeling a lot of time pressure and I realised I was doing social history and dental history but I hadn't done medical history yet and I was like why the heck did I do that like, cause he was like giving me so much information, that I realised that I'd missed this crucial step, and so it didn't matter like I just went back and did it like it wasn't like I'd opened his mouth or anything, but yeah so sometimes I just accidentally, move on too quickly or I forget to check the TMJ [Temporomandibular Joint Dysfunction] like something that's silly like that."* (, Focus Group 4, Lines 914-922)

Forgetting to converse with a patient was a particularly prevalent topic. Even if students remember to communicate with their patient regularly, they note the stress of clinic can make this communication incoherent:

> *"When something goes wrong I keep replaying what it, what happened like in my head over and over again, so then like my mind isn't focussed on how I should be saying things to the patient anymore, like I'll have, I'll keep saying the wrong thing and then I need to go back and then I need to re-say what I'm going to say."* (Focus Group 2, Lines 1050-1054)

Sometimes lack of communication from students leads patients to feel uneasy, making it more challenging to conduct procedures with an anxious patient:

> *"I get um much less coherent, and like I just kind of jump all over the place instead of having a nice signposted way of explaining things and so, I think uh that probably, makes it much harder for a patient to have a consistent train of thought and understand what I'm saying to them and same with my tutor like if they're asking me a question but, I'm not quite sure what they're meaning like I'll be like, rushing to lots of different answers to be like oh this or this or this but it's not very, I don't know, systematic."* (, Focus Group 4, Lines 854-860)

Communication is also important between a student and their tutor, and students' increased stress levels can lead to miscommunication of observations:

> *"When I'm stressed I feel that my brain don't connect with my mouth and like I don't know like I think I'm saying left for example but I say right so I'm like why is she that, like my tutor will be like are you saying like, you told me right but its left but I was like, I thought I said left like I don't know it's just like I meant to say 3 and then I said 4 so I don't know why it just doesn't connect maybe something wrong with me."* (█████, Focus Group 1, Lines 948-954)

Some students identified that their sleep was adversely impacted by clinic stress manifesting in varying ways. Some students expressed that they tend to sleep less due to waking up early on clinic days:

> *"I think clinic days like yeah those I get up without the alarm clock too and I was going to be like some days I'll just be like wait did I set my alarm the night before and then I like wake up and I'm just like you I can't be late."* █████, Focus Group 3, Lines 748-750)

Others mentioned grinding their teeth during their sleep; an activity that only appeared after starting dentistry:

> *"I grind a lot only when I'm stressed and also I only noticed it when I started doing dentistry."* (█████ Focus Group 1, Lines 834-835)

As dental students, they understand how detrimental this activity is to oral health making them feel distressed about their sleep:

> *"I start grinding my teeth like when I'm trying to sleep like I just start thinking of everything and I start grinding my teeth and I can, I can tell that I'm doing it but it's like I try to stop and then like 10 seconds later I'll start again, and that's never something that I had experienced before I dentistry, and now we've learnt about like people who do that so now I'm like more conscious of it."* (█████, Focus Group 1, Lines 791-796)

Summarised by Bryce, while trying to fall asleep, students' thoughts can linger on what could have been done differently, or mistakes that could have been avoided, and due to the stressful nature of clinic, these situations occur frequently:

> *"I think sleep is the big thing cause you start to, dwell on certain things, like that you could have done or worry about, yeah, you'll eventually worry about, did I miss something, did I do this right or something like that, um, you just kind of think about it when you go to sleep or could I have done this a different way or, how could I prevent this from happening next time it's just again, you think about it over and over again, you know try, you try when you can, not to think about anything but again that never works when you're just like, don't think about something and just go to sleep it works."* (■■■■, Focus Group 4, Lines 775-783)

3.4 Current Stress Management Approaches

3.4.1 Maintaining a healthy lifestyle

Students understand the importance of exercising, healthy eating, and making time for themselves, in order to manage life stressors and specifically those that arise from clinic. Most students reported participating in physical activity and that it distracted them from thinking about clinic stressors:

> *"I find that I like exercising does help a lot I remember like those last like last year especially we had a lot of sim clinic and … they would mark you every time you go in um with your fillings and stuff and that could be quite stressful especially if you have like a really bad day but I remember … if I found myself to be like overly stressed I would um go to the basketball court and just like shoot around until I forget about it … it's just like you and the court and then like nothing else and then you get back to reality."* (■■■■, Focus Group 1, Lines 156-163)

Participating in a sport also incorporates a social aspect to exercise, which can build social connection and comradery:

> *"I do running at the moment but I used to do other sports as well I also play badminton as well during the weekends and socialise with people during when I play badminton and things like that."* (█████ Focus Group 1, Lines 148-150)

As well as exercise, students also reported other activities that helped take their mind away from clinic stressors. Students spoke of the importance of making time for relaxation where they can rest and refresh away from clinic:

> *"Playing board games is really something I love um and I like, well I don't love reading but reading takes my mind off things um and it's sometimes quite interesting the stuff that I read whether online or books."* █████ Focus Group 3, Lines 234-237)

Several students also identified that music was a helpful distraction that also increased proficiency in study or everyday tasks:

> *"Blast music and like for 45 minutes and that it and be done, and then kind of like increase your productivity like for example ok like you can have a clear mind."* (█████, Focus Group 3, Lines 212-214)

3.4.2 Expressing and discussing concerns with friends and family

Most students discussed how helpful emotional support is while studying dentistry. Commonly, this comprised friends and family who are happy to listen to students' struggles, and sometimes offer solutions. Most students frequently mentioned that talking to other dental students can be helpful, as they have a shared understanding of what is being experienced:

> *"I got, roasted or something and then, uh my friend's just like oh do you want to go out to, have bubble tea or something and then yeah we just, hung out for a bit and just communicate and cause it was kind of like, cause we're all in the same profession we kind of bond or like can kind of, give us a bit of advice as well, um that helps."* (█████, Focus Group 4, Lines 1135-1139)

█████ described a supportive relationship she has with another student who often shares information and experiences he has with different tutors in clinic:

> *"He'd ask like questions that, the tutor asked him the last week so and like in case that pops up to me, like I guess I get stressed like at the instance cause like I'd be like I don't know the answer to that question but like, he teaches me the answer as well so, then I feel more prepared like kind of."* (Focus Group 3, Lines 1004-1008)

Most students identified that familial support was beneficial as family understand who the student is and how stress affects them:

> *"I just talk to my like family every, everyday so especially before clinic … even if I'd prepared more or whatever there's always like nerves … I'll just call my mum … I'm always nervous about the same thing so she gives me the same speech every time like you're not a dentist like you're not expected to know everything it's okay if you're being assessed like the tutor is going to understand like it's better to make mistakes at the beginning of the semester learn from it rather than like hide your mistakes… my mum always says like to show your mistakes now rather than when you're in fifth year and you're actually expected to like be prepared to be a dentist so yeah I just speak to my family a lot."* (, Focus Group 1, Lines 1037-1051)

Asking for a parent or close friend's opinion can give students confidence and reassurance in their abilities and actions:

> *"I think just personally I will go, and ask somebody else whether that'd be like a friend or like a parent or something usually a friend, and I'll ask them, ok is this like the best I can do like I need like sort of that reassurance from someone else saying ok no this is as much as you like the rest is out of your hands."* (, Focus Group 3, Lines 175-179)

Being able to voice struggles and concerns from clinic to others who will listen and be supportive was seen as the most helpful aspect of having an emotional support group:

> *"I think um just like not bottling it up is good like just venting feels a lot better like after you get it all out."* (, Focus Group 1, Lines 1034-1035)

3.4.3 Proactive preparation confers noticeable benefits

Many students discussed being proactive in managing their clinic-related stress, most often through preparation. Examples of preparation include reviewing the appointment schedule, studying patient forms, and mental relaxation:

> *"I like things to be really structured and I'll practice on my friends like go through the entire appointment from the beginning like pretending my friend is a patient, bringing them into the "clinic" and then talking to them even the small talk that I have to tell my patients, I have to rehearse that so that I can anticipate as much as possible so that's why I prepare more."* (, Focus Group 1, Lines 910-915)

Some students described overpreparation as rewarding; it makes them feel more comfortable and ready to deal with clinic stressors:

> *"Preparing for clinic is more sort of a reward because like I think, if I didn't prepare for clinic I'd be like having a horrible time so I, so when I'm preparing I'm like this is actually, going to make things positive rather than like make me feel like shit in the actual like, thing so that's why I'm just like I want to feel good about myself so I'll prepare."* (, Focus Group 4, Lines 933-937)

If students have clinic in the afternoon, some will ensure they prepare, and relax during the morning to boost their mood and reduce their stress:

> *"I'm in the afternoon so, I have the whole morning to prepare but then um around 12 o'clock … I'm like at level 7, just um on the balcony just, maybe reviewing notes or something, but um I think the last 10 minutes I'm just usually listening to music, um I don't know just some either calming music or just, my music like makes me happy, um just to get my, um to get my mood up at maximum and then, so you can go down to, prepare for it to go down, but um yeah it's kind of like that, but um I didn't, I did that for, I do that for my exams and then I guess, um I'm trying, I'm bringing it to the um clinic."* (, Focus Group 4, Lines 977-985)

Many students discussed how arriving early for clinic is helpful, as they have time to ensure they have everything they need, and to calm their nerves:

> *"Being in clinic early just makes you mentally prepared for everything and then you can, because some of them have already been to the clinic so you actually have a history to see so in case you miss out anything when you're at home you can still refer and you can still ask your mates or ask your tutor um how does it affect what I'm doing today and then you can just be more fully prepared yeah so there are things that are predictable that you can prepare for it and I think that's the most you can do for your session and that makes other stress go a lot lower."* (■■■■, Focus Group 1, Lines 1077-1084)

■■■■ identified that arriving early for clinic and being prepared positions him to ensure he starts clinic at his best:

> *"On days when I know I have like a complicated patient or like I have no history no chart nothing, and like on the phone they're complaining about something, and when you're confirming the appointment, I think that day I'll like make sure I get there like early like open my titanium open everything make sure all the like, uh radiograph forms they're filled out everything signed and ready to go just in case, and I think it's just like, getting everything prepared so I can like start off on the right foot right from the beginning."* (Focus Group 3, Lines 852-859)

3.5 Curriculum Improvements

3.5.1 Increased time for individual practice to foster student growth

Students frequently mentioned that their performance in clinic is graded from the beginning of the year. Moving from simulation clinic in their second year, to clinic in their third year is accompanied by many fears and stressors, as discussed previously. Although grading provides students with an added incentive to care for their patient to the best of their ability, many students felt that a short period of ungraded clinic practice would be beneficial to increasing their confidence in clinic:

> *"I think we should have clinic sessions where we're not assessed like, like from the first week the first clinic session we're already being assessed, I know you have the entire year where you're assessed on each grade so even if you get like an unsatisfactory for one session it's not the end of the world but like at the end of the day it still contributes like, I don't know I feel like we should get at least like a month of where we're not being assessed like we had the PCPC [Preparation for Comprehensive Patient-centred Care] program which um fills just like basically four weeks that we came in earlier but we were still kind of being assessed like we still had to do like um self-assessment feedbacks and I don't know I just, I just would like some sessions where there's no, there's no assessment you're just there to learn its fine like yeah I don't know I just find it really stressful the fact that we're being assessed from the first session, the first time you do something like you're being assessed about it."* (█████, Focus Group 1, Lines 1204-1216)

The expectation of students to be able to adequately perform a technique or skill that they have never attempted before on a real patient increases students' stress levels, which can impede their performance. Some students felt that if they had an opportunity to practice a technique or skill under the guidance of their tutor before being assessed, they would feel more competent and confident when being assessed:

> *"I personally would like a bit of an ease into it I think, you know especially it's like our first time ever and working with people who aren't friends and we haven't established something before is definitely harder to, you know get everything right in the one go and, um it's pretty disheartening if you don't do something right and like you're getting assessed like first thing it just makes you second guess everything, so it would be great if we could have just an opportunity like it doesn't have to be a week maybe just one session where our tutors would still be there but instead of like um, grading us or whatever they could just point out things you know not like, you know writing down and asking questions like what is the implications of this medication like they could just be like oh next time make sure you research this stuff you know be more, be more guided towards kind of what, they expect of us would be, would be I think less, less stressful in that situation."* (█████ Focus Group 2, Lines 1618-1631)

Many students discussed the value of being given dedicated time to individually practice techniques and skills that they have difficulty perfecting in clinic. As they are limited to their time in clinic to refine their skills, they essentially cannot practice outside of that time. Students saw clear benefits in being provided with additional time to practice in a simulation clinic; they could investigate different techniques and develop their skills to enact in clinic:

> *"You want to get that exposure you don't want to be just like confined to those 3 hours that you have in clinic every single week to, to refine your skills and then your tutors will be like oh well just go home and work on your plastic teeth, but it's like that's not, a human body that I can like you know rotate I can't practice where I'm sitting with plastic teeth on my table you know like it's, it's a totally different thing."* (, Focus Group 2, Lines 1567-1572)

If students were allowed additional formative practice, they could focus on specific areas highlighted by tutors that need improvement. Due to the stress that students feel while their tutor is present, giving them time to focus by themselves on their skills without critique could be beneficial to their development as described by :

> *"Sessions where people can go in and actually practice, like even if there was no tutor supervision, as is yeah I don't need a tutor to check over my thing cause I can look at it and be like ok that's what I was specifically trying to fix that this tutor said, like this tutor said ah your amalgams are too thin then I can be like ok do thicker thicker thicker amalgams in practice and then, then kind of tailor it, and that will make me more confident about doing it."* (Focus Group 2, Lines 1587-1593)

3.5.2 Greater honesty and consistency of tutor expectations and feedback

As mentioned in Section 3.2.1, tutors are one of the greatest stressors students experience in clinic, as they do not clearly communicate their expectations, are highly variable, and their feedback is inconsistent. In terms of curriculum improvements, students primarily discussed how tutors could establish and communicate their expectations at the beginning of clinic. This would

enable students to clearly understand tutor expectations, rather than finding them out partway through clinic:

> *"Before everything starts, they introduce themselves, set up their expectations, but if there might be formal time for that, that might be like really helpful."* (Focus Group 3, Lines 1470-1472)

Some students reported leaving clinic still feeling stressed due to their performance and/or contact with their tutor, and fear their next session. Overall, many students felt that staff (specifically tutors) could be more encouraging and supportive while in clinic to boost students' confidence:

> *"They'd be like oh even if you think that you like messed up horribly in that like, session if the tutors are like … I know that you did this but I see that you did this because of this, then you're like ok they see where I'm coming from and like I am not in too much trouble then it's like you leave the clinic less stressed."* Focus Group 3, Lines 1252-1256)

Several students also recognised the variability in tutor grading as an issue. suggested a form of inter-rater reliability or checkpoints that each student must fulfil, rather than the somewhat subjective grading perceived by students:

> *"Maybe there should be like certain checkpoints that … you need to meet and every person in the class has to meet these checkpoints … like you get two grades you get like the average of the two."* (Focus Group 3, Lines 1623, 1627, & 1658-1659)

Regarding feedback, some students expressed that if tutors gave more balanced and honest feedback rather than dissecting students' work, or not providing much feedback at all, students would have a better understanding of the areas they need to improve, without feeling stressed:

> *"If your tutor was able to be like yeah ok these are your areas that you didn't do well this session these are the areas you need to improve on however you did ok say even if it was just 1 thing or 2 things that like they're like you know what it could be something really basic like your ergonomics was good today like you were sitting in the chair properly like*

that would be more encouraging." ([redacted], Focus Group 2, Lines 1419-1424)

As noted above, tutor variability is a significant source of stress for students. Students compare which tutor they have in clinic as some tutors will grade students more strictly, and/or be less unapproachable than others. [redacted] identified that there should be a discussion around the culture of tutors, and how they treat students in clinic:

> *"I also think like it's not just a student thing like, I think that a big source of stress for students are the tutors like, because, everyone before, this year was like what tutor have you got, have you got a bad tutor, like the bad tutors are the ones where you freak out about that session, so I think there has to be a discussion about, um I guess, the culture of tutors and how they're treating like, what, what tutors are saying it's not ok, this is a professional, place, you can't yeah, anyway I think there has to be a discussion with tutors about how they, respect students."* (Focus Group 4, Lines 1805-1812)

CHAPTER 4

Discussion

4.1 Overview

This study aimed to explore third-year dental students' perceptions of stress, through identifying stressors, and stress manifestations, alongside current stress management strategies, and curriculum improvements that may help minimise and alleviate stress. Thematic analysis of focus groups identified themes according to the research aims: four themes described the varied stressors students manage during clinic, two themes detailed how these stressors manifest in students, three themes described students' current stress management strategies, and two themes outlined curriculum improvements students felt would help minimise or alleviate stress. These themes will be addressed, along with the study's strengths and limitations, future research avenues, and broader implications.

4.1.1 Stressors for Students

As qualitative data describing clinic-related stressors experienced by students in previous research has been relatively absent, this study aimed to enable students to express their experiences in their own words during focus groups. The themes described two primary clinic-related stressors, 'Inconsistency between tutors' and 'Duty of care to an unknown patient'. Tutors add significant variability to clinic, making it difficult for students to understand each tutor's expectations. Personality, expectations and the consistency of feedback, varied between tutors increasing students' stress. There appears to be no formal time for tutors to explain their expectations to students either at the start of a semester or before patients come into clinic. Therefore, students only discover tutors' expectations and preferences during consultations. These findings are consistent with previous literature as relationships with staff have been found

to induce a stress response in third- to fifth-year dental students (Al-Omari, 2005). In particular, dental students have identified the differing opinions among clinical staff as a source of stress (Harris et al., 2017).

Due to the requirement in clinic for students to consult with patients, it is challenging to control patient-related stressors. Much like tutors, each patient that students consult during clinic brings new sources of stress for them to manage. Whether it is dental anxiety, impatience, or lack of communication, each of these patient characteristics makes the consultation increasingly stressful for students. Results from previous literature indicated that dental students identify patient contact and responsibility as sources of stress; consistent with the current study (Alzahem et al., 2011).

The experience of clinic in students' third year of study aims to simulate the real dentistry world; unfortunately, variability in patient characteristics is simply an element of real-world practice. Even if the ADS screened each prospective patient to ensure they would be cooperative in clinic, this would be costly, unrealistic, and also unrepresentative of real dentistry practice. Therefore, in order to ease client-related stressors, other areas of clinic need to be examined. Clinic involves a great deal of uncertainty, and perhaps a possible intervention could be to increase dental students' tolerance for uncertainty and to enhance their ability to be flexible in the face of variability.

'Administering complex procedures' and 'Demonstrating competency requirements within a time limit' were also themes that described clinic-related stressors. Previous literature has highlighted completing course requirements as a significant stressor for dental students; consistent with the current study (Abu-Ghazaleh et al., 2011; Muirhead & Locker, 2007). Similar to patient stressors, these areas of stress are simply part of the clinic experience and simulate real

dentistry practice, where consultations are scheduled for a specified amount of time, and administering complex procedures is often required. Students must also demonstrate competency in clinic as part of grading. In the experiences described by students, tutor and patient stressors also come into play while students administer complex procedures. There is no doubt that the procedures students administer can be complicated, demanding fine motor control, a cooperative patient, and a calm student. However, when tutors ask questions designed to test students' knowledge, or a patient flinches, unsurprisingly, students find these experiences extremely stressful.

Individually, each of these stressors makes it very difficult for students to perform optimally in clinic, but collectively, it seems near impossible. Students have no control over tutor and patient-related stressors but then are also expected to competently administer procedures within a time limit. The stressors students experience during clinic can be summarised by the interactions between the competency requirements they must demonstrate within a time limit, and all of the other extraneous variables tutors and patients bring into play. Students made it apparent that often one mistake produces a snowball effect where they make subsequent mistakes, increasing their arousal. A possible intervention to minimise students' arousal may reduce the likelihood of this effect occurring, enabling students to perform optimally.

4.1.2 Manifestations of Stress

Whilst previous literature has identified objective symptoms of highly stressed individuals, the current study aimed to understand the specific effects that stress has on dental students, and their experiences when in clinic. These were described by the themes 'Physiological changes and discomfort' and 'Decreased mental clarity and expression and impaired sleep'. Some of the specific manifestations students experience during clinic are

consistent with previous literature such as students' hands shaking during procedures (Basudan et al., 2017). Although not experienced by all students, this manifestation is concerning as students are often using sharp metal instruments, having the potential to cause harm to their patient. Many students described feeling tired, a finding consistent with previous literature (Bello & Gumarao, 2016; Jain & Bansal, 2012), but more identified their quality of sleep was decreased. Also of concern to students, was the adverse impact on their oral health caused by grinding their teeth in their sleep. These findings are supported by previous literature as stress is commonly known to decrease rapid eye movement sleep, and sleep efficiency, while increasing awakenings (Kim & Dimsdale, 2007). The manifestations experienced by students fit with the general symptoms of anxiety. This is problematic for both patients and students, as other anxiety symptoms include feeling tense, fatigue, and difficulty concentrating (American Psychological Association, 2013). With the possibility of dental students developing sufficient anxiety symptomatology to satisfy a diagnosis of a stress or anxiety disorder, it is vital to reduce their stress levels. A sleep management intervention promoting good sleep hygiene and practice may be beneficial for dental students.

4.1.3 Current Stress Management Approaches

All students mentioned employing a variety of stress management approaches in daily life, with most also having techniques to use in clinic. These were described by the themes, 'Maintaining a healthy lifestyle', 'Expressing and discussing concerns with friends and family' and 'Proactive preparation confers noticeable benefits'. Eating healthily and undertaking regular exercise are commonly known methods for reducing stress. Social support is another effective stress management technique important for maintaining good physical and mental health known to enhance resilience to stress (Ozbay et al., 2007). Previous research on the typical coping

strategies utilised by dental students has found that they tend to use adaptive strategies (i.e., planning, instrumental support) more frequently than maladaptive strategies (i.e., denial, substance use). Further, students who used maladaptive coping strategies reported higher procedural anxiety (Piazza-Waggoner et al., 2003). Practising dentists are encouraged to participate in a variety of best practices for managing stress. Social support networks of family and friends are emphasised in order to acquire useful advice and feedback (Babore et al., 2020; Isikhan et al., 2004; Naidoo, 2015). Developing skills such as self-awareness and emotional regulation (Odigie, 2016), communication skills, and business management skills to meet the demands of dental practice, and more specific stress relief techniques such as relaxation, can all be useful to manage and/or alleviate stress (Naidoo, 2015). It is reassuring that students are using best practice methods to manage stress, many of which are commonly utilised by practising dentists and healthcare professionals.

4.1.4 Curriculum Improvements

This study was part of a broader research project involving dental students, with one of the intentions being to pilot a stress management program. While discussing curriculum improvements with students, the introduction of a stress management program was seemingly absent. Indeed, when the idea was introduced, some participants were entirely opposed to a stress management program. Many participants articulated that they understand how to manage stress and that the introduction of a stress management program was unnecessary. Further, as described previously, many clinic-related factors can lead to extreme stress during consultations. Therefore, students felt that curriculum improvements should seek to improve or reduce these factors, rather than assist them with their management of stress. The two main strategies to assist found in a systematic review of stress management in dental students were decreasing the

number of stressors, and increasing the ability to cope with stressors (Alzahem et al., 2014). The improvements suggested by students in the current study are consistent with these two strategies to some degree.

Suggested improvements concerning tutors were described by the theme, 'Greater honesty and consistency of tutor expectations and feedback'. The crux of tutor-related stressors is miscommunication, or sometimes lack of communication. If students are unaware of tutors' working style, then they will be unable to meet tutors' expectations. Further, if they are expected to improve over time, they need to receive honest feedback in order to advance their dental skills.

The improvements described by the theme, 'Increased time for individual practice to foster student growth' revolved around time set aside from clinic for students to practice their clinical skills. In order for students to perform optimally in the stressful clinic scenario, they require dedicated time to practice the procedures and techniques without simultaneously managing clinic-related stressors. Becoming confident and competent in a given procedure would remove one stressful factor when in clinic.

As previously mentioned, any improvements to the curriculum or clinic need to be focused on either reducing the volume of stressors students experience or ensuring they feel prepared and comfortable to manage those stressors. Third-year students at the ADS do not want a typical stress management intervention. The current results have shown that students already utilise a variety of techniques that have been proven in previous literature. Instead, it might be beneficial to introduce a brief workshop focusing on clinic and tutor expectations where a formal time is designated for tutors to articulate their expectations. This workshop could also focus on tolerating uncertainty. As previously mentioned, variability is a common theme throughout clinic, whether it comes from tutors, patients or procedures. Therefore, a workshop dedicated to

teaching students to tolerate uncertainty, whilst also reinforcing their current stress management strategies appears beneficial.

4.2 Methodological Considerations and Future Research

The findings must be considered in light of limitations. The data was collected early into students' third year of training when they had only just commenced seeing patients in clinic. Therefore, it could be said that their experiences in clinic were somewhat limited. If the data was collected at the midpoint of the year, results might have been different. Further research could involve longitudinal approaches collecting data from dental students at more than one point in the year (i.e., the beginning and end of the year). Through collecting data at multiple time points, results could indicate whether students' stress levels change over time as their competency increases. Throughout the year, students would gain more experience, hopefully enhancing competence and confidence, and, in turn, reducing their stress levels. The possibility for formative practice was also a curriculum improvement suggested by students, where their confidence could grow through repeating procedures and skills independently. Future research may also explore the benefits of any additional formative practice.

The sample used in the current study is somewhat limited. Although the sample of 21 students comprised 26.6% of the ADS third-year dental student cohort, students were self-selected. Due to this, the study may have attracted certain types of students who were more motivated or disgruntled to discuss their experiences. The sample had a gender ratio of 1 male:3 females and predominately consisted of students of Asian ethnicity (76.2%). While the unbalanced gender ratio is dissimilar from the composition of registered dentists reported by the Dental Board of Australia (2020), 47.4% male and 52.6% female, the current study was consistent with the tendency for there to be more females in the dentistry profession than males.

The third-year dentistry student cohort at the ADS also has a relatively large number of international students (42 international, 37 domestic), whereas only 33% of the current sample were international students. While the sample has limitations, it is important to also recognise its diversity. Participants were aged 20-32 years and 33% were international students. Although most participants were of Asian ethnicity, 38.1% were born in Australia. Two-thirds of participants were single, and at the time of data collection were living in a variety of arrangements (alone, with friends or family, in a share house, in residential accommodation).

Demographic differences between students may have impacted the results. Individuals of Asian ethnicity often come from families who have high expectations for them to achieve highly in their studies and career (Mau, 1998; Shen et al., 2014; Spera et al., 2009). These students may have different perceptions of stress and coping strategies. International students who are living away from family also lack close familial support compared to other students who are living at home. A future research pathway could involve international students, specifically in relation to the current findings that many students valued support from family and friends. Male and female medical students have also been found to perceive stress differently, impacting the results (Worly et al., 2017). Future research involving dentistry students could investigate differences between gender, ethnicity, and student type.

It is also important to recognise when the data was collected. As previously mentioned, the focus groups were conducted between March 5th and March 12th 2020. At this time, the world was on the precipice of the COVID-19 pandemic. Social distancing restrictions had not yet been enforced, and university classes were being taught face-to-face with the participants still providing services in dental clinics. Therefore, COVID-19 is thought to have had a limited

impact on the data collected. Future research may explore perceptions of stress during COVID-19.

The current study aimed to collect data from dental students about their perceptions of stress. This study is part of a larger project, which will also involve the collection of objective physiological measures of stress. An inherent limitation of the qualitative data collected in the current study is that it is students' subjective perceptions of stress. As individuals may not accurately identify if they are stressed, further research should examine the relationship between students' perceptions of stress and physiological measures of arousal. Although it is important to collect qualitative data regarding students' perceptions of stress, it is equally important to conduct physiological research to observe whether students objectively show signs of stress and whether there is congruence between student perceptions and physiology.

Taking into account these limitations, the current study makes an important contribution to literature exploring third-year dental students' qualitative perceptions of stress where they could express their experiences in their own words; an area previously absent. The focus groups also collected a large amount of qualitative data where students could consider each other's experiences alongside their own.

4.3 Implications

As one of the first studies about stress involving the collection of qualitative data from dental students, this study offers a significant contribution to the literature. The results of the study, particularly, clinic-related stressors and curriculum improvements expressed by students, have significant value for the ADS and the profession more broadly. As students have identified the most stressful factors in clinic, staff could target those stressors, and make changes to improve the clinical environment for students. Curriculum improvements suggested by students,

including improving tutor training and explicitly communicating tutor expectations, as well as additional formative clinic practice, could be implemented.

Although students do not desire a typical stress management intervention, a tailored clinic preparation program could be developed. A clinic preparation course could provide students with an opportunity to understand and discuss the expectations of university staff, tutors, and themselves. Therefore, they would have a clearer understanding and feel better prepared when they begin clinic. The clinic preparation program could also aim to enhance students' tolerance for uncertainty. Students would also benefit from additional time for formative practice. Having the opportunity to rehearse skills and procedures without the added stress of being graded on their performance could help build competence and confidence, and prepare students for the uncertainty of clinic. While students have demonstrated that they have stress management skills, there may also be an opportunity to reinforce methods of self-care.

The results of the current study have implications for students transitioning from second to third-year dentistry. It may be beneficial to expose second-year students to clinic in an observational capacity to familiarise them with the reality of clinic before being graded on their clinical performance in the third year. Additional formative practice would also assist students' preparation for clinic-related stressors.

4.4 Conclusion

This study aimed to explore third-year dental students' perceptions of stress, including perceived stressors, manifestations of stress, current stress management strategies, and curriculum improvements that could assist students to minimise and alleviate stress. The collection of qualitative data revealed tutors, patients, procedures, and demonstrating competency requirements as significant sources of stress. Manifestations consisted largely of

psychological symptoms such as decreased mental clarity, communication and sleep quality. Students reported a variety of useful and adaptive stress management strategies. Curriculum improvements suggested by students included improved tutor training and clarity about expectations as well as opportunities for formative practice. It is important to understand how dental students experience stress in clinic as their career will primarily consist of the management of patients in this scenario. Although dentists as a profession are known to be highly stressed, the discussion between students in focus groups indicated a tight-knit community where shared adversity promotes connectedness. While it is affirming that students are employing effective stress management strategies, staff in the ADS could consider curriculum improvements that better support students and contribute to them having long and fruitful careers.

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Appendix A

PARTICIPANT INFORMATION SHEET

PROJECT TITLE: Stress as a Barrier to Optimal Clinical Performance in Third Year Dental Students
HUMAN RESEARCH ETHICS COMMITTEE APPROVAL NUMBER: H-2019-192
PRINCIPAL INVESTIGATOR: XXXXXXXXXX

Dear Participant,

You are invited to participate in the research project described below.

What is the project about?

This research project seeks to understand stress and stress management strategies among third year dental students. By gaining a better understanding about student stress it may be possible to assist students to achieve better completion rates for their dental training as well as assist in the development of lifelong stress management strategies to improve mental health and wellbeing.

Who is undertaking the project?

This project is being conducted by XXXXXXXXXX, XXXXXXXXXX, XXXXXXXXXX, XXXXXXXXXX, XXXXXXXXXX.

Why am I being invited to participate?

You are being invited as you are a student who is or has undertaken third year study in Bachelor of Dental Surgery Program at the University of Adelaide

What am I being invited to do?

You are being invited to participate in a range of research activities. These include: (a) participating in a focus group to talk about your experiences of stress and stress management, (b) completing a survey and brief psychological test, (c) being observed and monitored in clinic situations, and (d) participating in a stress management and stress-care program. Participation will occur on campus, in the Adelaide Dental School, the South Australian Dental Service Clinic and online, where appropriate. Focus groups will be audio recorded, so that anonymous transcripts of the discussions can be made.

How much time will my involvement in the project take?

It is anticipated that the time required for each aspect is as follows: focus group – one hour; survey – 25 minutes; clinic observation/monitoring - 30 minutes for baseline physiological results; 24 hours clinical heart rate (HR) recording (in scheduled clinic sessions); stress management intervention – 3 hours.

Are there any risks associated with participating in this project?

As there are multiple aspects to this study you make experience some inconvenience due to the time commitment required. Also, as you are being asked to discuss/report your stress levels and stress management strategies you may experience some emotional distress. However, every effort will be made to minimise this possibility, and you will be provided with a list of supports that you may wish to access. These include contact details for support and telephone helplines. You can also view these supports at the end of the information sheet. You can also choose not to answer questions, or to end the interview at any time. There is no perceived burden in relation to your clinical work.

What are the potential benefits of the research project?

The study may provide benefits to participants by enabling them to identify their own clinical stressors and how well their stress management strategies currently work to manage stress and allow optimal performance. Participants may also achieve more effective completion of their dental training program as well as learn lifelong stress management strategies to improve mental health and wellbeing.

Can I withdraw from the project?

Participation in this project is completely voluntary. If you agree to participate, you can withdraw from most aspects of the study at any time. If you agree to participate in the survey, you can withdraw from the study at any time before submitting your survey responses. If you choose not to participate or to withdraw from the research your decision will not affect your ongoing studies at the University of Adelaide.

What will happen to my information?

Your responses will remain entirely confidential and will be de-identified. While all efforts will be made to remove any information that might identify you, as the sample size is small, complete anonymity cannot be guaranteed. However, the utmost care will be taken to ensure that no personally identifying details are revealed. All data will be stored securely on a password-protected computer for a minimum of five years. The resulting data may be written up for publication in a peer-reviewed journal, or shared with other university course and program coordinators, and may be presented at conferences. Participants will not be identified in any publication or presentation; only summary data will be reported.

Your information will only be used as described in this participant information sheet and it will only be disclosed according to the consent provided, except as required by law.

Who do I contact if I have questions about the project?

Should you wish to ask further questions about the project, please contact XXXXXXXXXX, XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

What if I have a complaint or any concerns?

The study has been approved by the Human Research Ethics Committee at the University of Adelaide (approval number H-2019-192). This research project will be conducted according to the NHMRC National Statement on Ethical Conduct in Human Research 2007 (Updated 2018). If you have questions or problems associated with the practical aspects of your participation in the project, or wish to raise a concern or complaint about the project, then you should consult the Principal Investigator. If you wish to speak with an independent person regarding concerns or a complaint, the University's policy on research involving human participants, or your rights as a participant, please contact the Human Research Ethics Committee's Secretariat on:

Phone: +61 8 8313 6028
Email: hrec@adelaide.edu.au
Post: Level 4, Rundle Mall Plaza, 50 Rundle Mall, ADELAIDE SA 5000
Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

If I want to participate, what do I do?

Please contact XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Yours sincerely,

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

Support Resources:

• University Counselling Service
Available Monday to Friday 9am-5pm: (08) 8313 5663

• University Crisis Line
Available 5pm – 9am daily: 1300 167 654

• Lifeline
Available 24/7: 13 11 14

• Beyond Blue
Available 24/7: 1300 224 636

Appendix B

CONSENT FORM

1. I have read the attached Information Sheet and agree to take part in the following research project:

Title:	Stress as a barrier to optimal clinical performance in third year dental students
Ethics Approval Number:	H-2019-192

2. I have had the project, so far as it affects me, and the potential risks and burdens fully explained to my satisfaction by the research worker. I have had the opportunity to ask any questions I may have about the project and my participation. My consent is given freely.
3. I have been given the opportunity to have a member of my family or a friend present while the project was explained to me.
4. Although I understand the purpose of the research project, it has also been explained that my involvement may not be of any benefit to me.
5. I agree to participate in the activities outlined in the participant information sheet.

    Focus group ☐ Yes ☐ No

    Survey ☐ Yes ☐ No

    Clinical experiment/Monitoring in clinic ☐ Yes ☐ No

    Stress management intervention ☐ Yes ☐ No

6. I agree to be:

    Audio recorded ☐ Yes ☐ No

7. I understand that I am free to withdraw from the project at any time and that this will not affect my study at the University, now or in the future.

8. I have been informed that the information gained in the project may be published in a book/journal article/report/conference presentations/shared with course and program coordinators within the University.
9. I have been informed that in the published materials I will not be identified and my personal results will not be divulged.
10. I agree to my information being used for future research purposes as follows:
    - Research undertaken by these same researcher(s) Yes ☐ No ☐
    - Related research undertaken by any researcher(s) Yes ☐ No ☐
    - Any research undertaken by any researcher(s) Yes ☐ No ☐

11. I understand my information will only be disclosed according to the consent provided, except where disclosure is required by law.

12. I am aware that I should keep a copy of this Consent Form, when completed, and the attached Information Sheet.

Participant to complete:

Name: ______________________Signature: ________________________ Date: __________

Researcher/Witness to complete: [This can be removed for electronically returned consent forms.]I have described the nature of the research to

____

(print name of participant)

and in my opinion she/he understood the explanation.

Signature: ___________________Position:__________________________ Date: __________

Appendix C

Participant Information

1. ID: Please write your ID Number: ____

2. Age: What is your age in years? ____________________________________

3. Gender: With which gender do you identify?

Female Male Other: Please specify __________________________

4. Which country were you born in? ____

5. Which of the following best represents your ethnic heritage?

Australian Aboriginal/Torres Strait Islander New Zealander Maori or Pacific Islander

European African Asian Middle Eastern

American (including Canadian, Mexican, Brazilian) Other: Please specify: _______________

6. What is your current relationships status:

Single In a relationship Married/Defacto/Engaged Separated/Divorced

7. Do you live?

Alone With parents With family With partner

With friends In a share house In residential accommodation

8. What is your post code? ____

9. What is the highest level of education you have completed?

Secondary Education Apprenticeship Bachelors Honours Masters PhD

10. What level of education are you currently completing? ________________________

11. Are you enrolled as:

International Domestic

12. Are you currently in paid employment?

No Yes, part time Yes, full time

Appendix D

FOCUS GROUP TOPIC GUIDE

Demographics

- Age in years
- Gender (male/female/other)

Interview Domains:

The primary topic questions will be supplemented with clarifying and probing questions to encourage more in-depth responses.

1. Can you describe what led you to choose dentistry as a career?
2. Can you tell us whether you consider yourself to be a person who easily becomes stressed in every-day life?

   Prompts:

   - When difficult things happen in life how do you feel?
   - What things lead you to feel stressed?
   - During clinic

3. What techniques do you use to manage stress in your every-day life?

   Prompts:

   - What things do you do for self-care?
   - How do you like to spend your time when you are not studying?
   - What interests or hobbies do you have?
   - Possible responses that may occur - listen to certain type of music, take a walk, deep

     breathing/meditation, drink water, remove oneself from the situation, talk to other

     people, drink coffee, reflection, visualisation

4. How do you feel when you think about seeing patients in clinic?

   Prompts:

- How would you describe the emotions you have when you think about working with patients?

5. What aspects of clinic cause you the most stress/worry?

   Prompts:

   - Pre-clinic
   - During clinic
   - Post-clinic

6. Can you describe what causes you to feel stressed/worried about clinic?

   Prompts:

   - What are you worried will happen in clinic?
   - What are your personal triggers for stress in clinic?
   - Clinical factors: What clinical factors, if any, cause you to feel stressed? Failure to complete clinical requirements; criticism by supervisors; patient contact; meeting a patient for the first time; meeting a patient for subsequent appointments; responsibility for patient care; specific aspects of a case; clinic bay position; atmosphere created by supervisors; the tutor; the student learner helping you; lack of time; performance pressure; excessive workload.
   - What aspects, if any, about patient contact cause you stress: rapport/personality; type - age, gender; difficulty of case, procedures required – exam, scale, filling.

7. How does stress manifest for you?

   Prompts:

   - When you are stressed/worried about clinic can you describe how your body is affected?
   - What changes do you notice in your body?
   - What are the physical signs that you are stressed (e.g. sweating, increased respiration, can't think clearly, communication problems, palpitations, coldness of extremities, tremors, hunger, insomnia, avoidance behaviour, stomach upset, hostility, memory, concentration)

8. When you are stressed/worried about clinic can you describe how it affects your actions?

   Prompts:

   - How does it affect your preparation for clinic?

- How does it affect your ability to communicate with your patient?
- How does it affect your ability to communicate with your tutor?
- How does it affect your ability to conduct procedures?

9. How do you manage your stress in relation to clinic?

    Prompts:

    - Pre-clinic
    - During clinic – e.g. deep breathing, change mask/gloves, talk to tutor/consult tutor for advice
    - Post-clinic – e.g. deep breathing, discussion with colleagues

10. In general, how many times do you need to do a task to feel comfortable with it?
11. What could university staff do to help reduce your stress in relation to clinic?

    Prompts:

    - Pre-clinic
    - During clinic
    - Post-clinic

12. If you could give one piece of advice to another student who is stressed about clinic what would it be?
13. If a program could be introduced to better prepare all students for clinic what format would you like the program to take and what should it include?
14. If a program could be introduced to provide increased support for students who identify as, or are noticeably stressed, during clinic what format would you like the program to take and what should it include?
15. Were there any other questions we should have asked?