How a dental anxiety service for torture, abuse and dental phobia patients works and why

A realist evaluation

by

Emilie Bryne

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Tannhelsetjenestens kompetansesenter Rogaland

University of Stavanger
NO-4036 Stavanger
NORWAY
www.uis.no

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Det er utrolig hva man kan få til når man ikke kjenner sine egne begrensninger. — Tormod Bryne, 05.03.1934–12.06.2022

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Summary

Background. Neglecting one's oral health can negatively impact one's general health, quality of life and well-being. Attending dental examinations is good step toward maintaining and attaining good oral health. However, people exposed to torture or abuse or affected by dental phobia tend to avoid dental examinations and care due to elevated anxiety or because the dental setting may trigger retraumatisation.

The current literature suggests that cognitive behavioural therapy (CBT) administered by a dental practitioner can effectively alleviate dental anxiety. Nevertheless, research on *how* dental practitioners successfully deliver CBT or *how* service delivery incorporates this for heterogeneous patient groups remains scarce, leaving us with a knowledge gap. How are services incorporating CBT to cater to the different patient needs, and how are dental practitioners adopting CBT to alleviate dental anxiety in their service delivery?

The TADA service. In 2010, the Norwegian government established the TADA (torture, abuse and dental anxiety) service, and as of 2018, 52 TADA teams existed across the country with the aim of alleviating dental anxiety for patients with a history of torture or abuse or who meet the diagnostic criteria of dental phobia. The TADA teams are interdisciplinary and include psychologists and dental practitioners. The psychologist oversees patient admission and trains dental practitioners, and dental practitioners deliver CBT. After dental anxiety is alleviated, patients are referred to a follow-up team that restores the patients' oral health. Although the TADA service was rolled out as a national service more than 10 years ago, little research exists on the service itself or the patient group. Moreover, even though dental anxiety is an international challenge, the TADA service seems unique in its service delivery to its contextual patient group.

A realist evaluation. A realist evaluation is a theory-driven approach that develops, tests and refines programme theories that articulate and explain what works within a programme, for whom, under what circumstances, how and why. A realist evaluation was thus chosen due to its ability to inform how, why and for whom the TADA service is working. Investigating the TADA service through a realist lens can inform us on the practice of CBT service delivery and the dental practitioner's role.

Evaluation question. The realist question of what works within TADA, for whom, under what circumstances, how and why was operationalised by answering the following three focused questions:

1. From a developer perspective, how is the service designed to achieve its outcomes of alleviating dental anxiety and restoring dentition for its users?
2. From a deliverer perspective, how and under what circumstances are TADA dental practitioners managing the role change of alleviating dental anxiety for TADA patients?
3. From a patient perspective, how is the TADA service alleviating patients' dental anxiety?

Data collection. To answer the focused questions, the study collected data in two phases. The first phase of the study used a sequential multimethod design and collected data from interviews with 12 service developers and 13 service documents. The second phase of data collection recruited 15 patients from one county in Norway and interviewed them after they had finished exposure treatment, an element of CBT, thus, the service assumed their anxiety was alleviated.

Analyses methods. Data retrieved from the service developers in the first phase of collection were analysed through a direct approach of content analysis incorporating the heuristic logic formula: context + mechanism = outcome (CMO). The service developers were located

across Norway and represented a national perspective of holding a dual role while acting as service deliverers. Thus, they informed theory development from both the developer and deliverer perspectives and answered focused questions one and two. Data retrieved from the individual patient interviews in the second phase were analysed through a template analysis that incorporated CMO heuristics. Individual patient interviews were used for the following phase to answer the last focused question.

Key findings from investigating what works within TADA, for whom and under what circumstances through a realist lens led to 10 programme theories depicting structural and relational features. Four programme theories depict how, from a developer perspective, TADA's structural features alleviate torture, abuse and dental phobia patients' dental anxiety and restore their oral health. These programme theories conclude that the TADA service adopts a hybrid bottom-up/top-down service that allows teams to practice discretion and tailor their approach to meet individual needs. Moreover, the TADA service is free of charge for its patient group, which has improved service accessibility for patients otherwise found to avoid services. Nevertheless, the service still struggles to reach torture survivors (Paper 1, "Exploring the Contexts, Mechanisms and Outcomes of a Torture, Abuse and Dental Anxiety Service in Norway").

Three programme theories depict relational elements that, from a service deliverer's perspective, impact how and under what circumstances the dental practitioners manage the role change in delivering the component of CBT, exposure therapy, to alleviate dental anxiety. These programme theories conclude that dental practitioners successfully alleviate patients' dental anxiety by adopting roles that enable trust, a safe space and gradual desensitisation towards the patient's fear triggers. For dental practitioners to adopt these roles, they need to be in a context that provides them with the resource of time and an institutional setting where they are in proximity to the psychologist and where an interrelationship

between the psychologist and dental practitioner is fostered. This allows dental practitioners to build a skillset on how to effectively communicate and grade the therapy to individual anxiety levels (Paper 2, “More Than Just a Dental Practitioner”).

The last three programme theories explain how patients address the relational service features leading to their alleviated dental anxiety. By building on the theory from phase one, patients explained that their dental anxiety was alleviated when dental practitioners provided them with a calm and holistic approach, positive judgement and predictability throughout the service pathway. This led patients to feel understood, cared for and in control, their shame to be reduced and their self-esteem to emerge. The patients insinuated that it was not the CBT intervention alone that alleviated their dental anxiety, but that it was affected by the approach taken by dental practitioners (Paper 3, “Seeing the Person Before the Teeth”).

Conclusion. Dental anxiety and the effects it has on oral health and, in turn, the individual is well established in the literature. Nonetheless, a review of the literature shows that the TADA service’s approach to alleviating this specific type of patient’s dental anxiety and restoring their dentition seems unique to the Norwegian welfare state. Thus, the programme theories developed for the current study may be of interest to the international community looking at ways to tackle the challenge of dental anxiety for vulnerable patients. The specificity of the programme theories that this study has developed brings a certain transferability, in that the reader can assess if a similar programme can be implemented into their context.

The findings of this study contribute to the knowledge gap on dental anxiety service delivery and how dental practitioners adopt therapeutic roles in anxiety treatment. The study findings imply that subsidising a dental anxiety service is essential for reaching a vulnerable patient population otherwise found to avoid general dental services. Moreover,

the current structure is deemed valuable in that it permits the service to tailor itself according to patients' individual needs. This means that the context must continue to permit professional discretion and not assume that "one size fits all". The findings from the current study also indicate that the dental practitioner's approach to a dental anxiety service plays a meaningful role in alleviating dental anxiety. For patients, they need to be met with an approach that reflects person-centred care. From a deliverer perspective, they need to be in an institutional setting that provides time as a resource and a context that allows them to learn from and lean on the psychologist.

List of papers

Paper 1

Bryne, E., Hean, S., Evensen, K. B., & Bull, V. H. (2022). Exploring the contexts, mechanisms and outcomes of a torture, abuse and dental anxiety service in Norway: A realist evaluation. *BMC Health Services Research, 22*(1), 533. doi:/10.1186/s12913-022-07913-7

Paper 2

Bryne, E., Hean, S., Evensen, K., & Bull, V. (2021). More than just a dental practitioner. *European Journal of Oral Sciences, 129*(6). doi:10.1111/eos.12820

Paper 3

Bryne, E., Hean, S., Evensen, K., & Bull, V. (2022). Seeing the person before the teeth: A realist evaluation of a dental anxiety service in Norway. *European Journal of Oral Sciences, 130*(3). doi:10.1111/eos.12860

Abbreviations

TADA: Torture, abuse and dental anxiety

CBT: Cognitive behavioural therapy

CMO: Context mechanism outcome

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1 Introduction

1.1 Oral health

A robust set of white and healthy teeth has long been valued for both aesthetic and functional reasons. This is echoed from the Old Testament (Bible, 2011, Gen. 49:12) to The Beatles, who sing about the consequences of overeating candy in their song "Savoury Truffle" (Beatles, 1968). Teeth are part of one's oral health, which affects the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex (Glick et al., 2017; Locker et al., 2000; Ng & Leung, 2006; Slade, 1997). From here on, oral health covers craniofacial and dental health.

Oral conditions and dissatisfaction with teeth and mouth negatively impact a person's daily living and quality of life (Haag et al., 2017; Naito et al., 2006). Research shows that oral conditions that affect aesthetics and oral functioning can be burdensome for the individual and society as a whole, as people affected tend to isolate themselves and withdraw from society (Kisely, 2016). Studies show that, if a person has a problem with mastication, speech and oral aesthetics, this negatively affects their self-esteem and social relationships (Gil-Montoya et al., 2015). Beyond the psychosocial effects of poor oral health, severe physiological health consequences, such as endocarditis, mouth cancer and diabetes, are also associated with poor oral health (Lockhart et al., 2009; Meurman, 2010; World Health Organization, 2005).

Most oral diseases and poor oral health are preventable. Prevention procedures are defined by dental practitioners as "good hygiene routines", which include tooth brushing, flossing and attending dental service examinations. Nevertheless, an estimated 3.5 billion people worldwide are affected by various oral diseases (Kassebaum et al., 2017). A factor complicating the matter is that most oral diseases are

chronic and progressive. Thus, a lack of self-maintenance, poor oral hygiene routines or avoidance behaviour is likely to negatively affect the disease. Therefore, dental practitioners advise regular attention from a trained professional (Armfield, 2012).

The progressive and irreversible nature of oral diseases and the adverse psychosocial and general health effects of poor oral health have led the World Dental Federation to declare good oral health a fundamental human right (Glick et al., 2017). This declaration builds on the World Health Organization's reports emphasising the importance of implementing effective public health programmes to facilitate good oral health (Petersen, 2003; World Health Organization, 2005).

Research has revealed oral health inequality, in which vulnerable groups are evidently affected by poor oral health (Watt et al., 2018, 2019). Therefore, a recent Oral Health series published by *The Lancet* highlighted the need for strong and effective oral health programmes and a radical change in dental service delivery to close the gap between good and poor oral health ("Oral Health at a Tipping Point", 2019).

Policy also needs to support the implementation of sound and accessible services for all populations to achieve good oral health. However, a policy intervention's success depends on the individuals using the proposed service. Dental anxiety is one barrier to dental service utilisation (Armfield et al., 2007).

1.2 Dental anxiety's impact on oral health

Anxiety is an innate response that is vital for human survival (Steimer, 2002). From an evolutionary perspective, a biological response to a threat stimuli must be present to save oneself from potential danger (Steimer, 2002). When faced with a threat, the body reacts with a fight or flight mode, removing oneself from the danger (Quick & Spielberger, 1994). More recent studies have included faint, freeze and

immobilisation (S. M. Cohen et al., 2000; Kozlowska et al., 2015). These defence responses require sudden cognitive, physiological and emotional alteration, which can be stressful and painful for the individual. Thus, anxiety is understood to consist of (1) a subjective-emotional component, which includes a person's apprehension and feelings; (2) a cognitive component that includes a person's thoughts and coping abilities (3) a physiological component, which entails bodily reactions such as heart and blood pressure, muscle tension and breathing; and (4) behavioural component, which entails how a person reacts -such as avoidance (Holt et al., 2019b). Although anxiety is considered essential for survival, it can also become pathologic when stimuli responses are activated and prevail in scenarios with no real threat or danger or the behavioural component of anxiety interferes with daily life (Abramowitz et al., 2019; Holt et al., 2019b).

Dental anxiety may lead to maladaptive behaviours, and consequently to poor oral health. This phenomenon has been described in the literature as early as 1946 (Coriat, 1946):

> This type of fear may be termed dental anxiety and in some cases is so prominent and exaggerated that it becomes an obsessive anxiety concerning the teeth, to such an extent that any dental surgery, no matter how minor, or even dental prophylaxis treatment, may be so postponed or procrastinated that the inroads of disease may affect the entire dental apparatus. (p. 1)

Dental anxiety is a conditioned response linked to high and prolonged anticipation and worry about the perceived danger of the dental setting and is considered the most prominent type of fear (Oosterink et al., 2009).

The aetiology of dental anxiety is multifaceted and complex. Some scholars ascribe dental anxiety resulting from a negative treatment

experience, typically from early childhood years (Locker et al., 1996). Theories, such as classical conditioning theory, have also been used to describe how unconditioned stimuli in the dental context may be paired with a negative stimulus and create an unconditioned response (Abramowitz et al., 2019; Holt et al., 2019b). For example, the drill's sound, smell, vibration or sight may trigger a fear response, as the stimulus is paired with a painful drilling experience. Other scholars describe how dental anxiety can be taught vicariously, such as children observing parents or other caregivers' anxiety towards dental procedures and settings (Milgrom et al., 1995; Themessel-Huber et al., 2010). Attributes such as age, gender, personality traits, beliefs about the dentist, the patient's oral health and dental examination routines are also found to correlate with higher dental anxiety (Armfield, 2006; De Jongh., 1995; Eli et al., 1997; Oosterlink et al., 2008). Traumas may also be paired with the dental setting, meaning patients with a history of abuse or torture may develop dental anxiety due to their traumatic incident (section 1.3). Therefore, there may be multiple and various explanations to why some people have dental anxiety.

A systematic review estimated that 15.3% worldwide struggle with severe dental anxiety (Silveira et al., 2021). In Norway, 6–12% of the population suffers from dental anxiety (Nermo et al., 2019). People with dental anxiety are often less attentive to their dental hygiene; they floss less, brush less and avoid or postpone dental treatment more frequently (Schuller et al., 2003). Thus, their oral health tends to be poor (Armfield et al., 2007), and they have fewer teeth, more fillings and report more negative impacts on their daily routines due to oral diseases (Abrahamsson et al., 2001; Hakeberg et al., 1993). An epidemiological study using a dental anxiety score (DAS) uncovered that people scoring high on DAS (severe dental anxiety) typically had 7.3 extracted teeth (compared to 4.9, a low DAS score), almost twice as many decayed surfaces (1.5 compared to 0.8) and more decayed teeth (1.2 compared to 0.7; Schuller et al., 2003).

Dental phobia is often considered a more severe type of dental anxiety. For adult patients to be diagnosed with a dental phobia disorder, a psychological assessment underlies the following criteria (A–G), as outlined in the Diagnostical Statistical Manual 5th edition (DSM-V) (American Psychiatric Association [APA], 2013; Gordon et al., 2013):

A. The patient has a considerable and prolonged response to the presence or anticipation of a specific object or situation.
B. Immediate anxiety responses are evoked from exposure to this stimulus.
C. The fear is recognised as unreasonable and excessive by the individual.
D. An avoidance behaviour or enduring strong anxiety results from the phobic setting/stimulus.
E. The phobic stimulus or situation impairs the individual's daily routines and social or occupational life.
F. Adults do not need to meet a minimum duration for onset, but for children (under 18 years), symptoms must have persisted for at least six months.
G. Differential diagnoses do not explain the symptoms.

Consistent with the DSM-V criterion (letter D), research shows that years go by before people with dental phobia seek help (Carlsson et al., 2015; Cohen et al., 2000; Kheir et al., 2018; Kvale et al., 2002). Avoidance behaviour is a tactical strategy that refrains the individual from arousal-inducing activity. Berggren (1984) proposes the "vicious cycle of fear" theory to describe the relationship between dental anxiety, avoidance behaviour and poor oral health. The theory states that a person's initial fear may lead them to cancel a dental appointment, obscuring periodic dental service visits. This irregularity reflects an avoidance behaviour in which they are absent from the services or only show up for emergency treatment procedures to alleviate pain. As oral diseases are progressive, oral health worsens if not treated. The individual may be aware of this. Their inability to attend treatment

services triggers a shame response, and due to their deteriorating oral health, they may isolate themselves, which leads to social and occupational challenges. The assumption is that the anxiety will increase with time, enhancing their avoidance behaviour and leading them to isolate themselves even more (Berggren, 1984). Berggren (1984) considers that the only way to stop oral decay and reengage these patients in social and occupational events is to break the cycle. The vicious cycle theory has been tested and evidenced in Australian and Dutch contexts (Armfield et al., 2007; De Jongh et al., 2011).

Furthermore, Clark (1986) builds on the theory of the vicious cycle of fear, relating it to panic disorders and introducing trigger stimuli. The assumption is that a patient's cognition becomes distorted when a trigger stimulus creates a physiological response, leading to a perceived panic attack. For example, attending to or thinking about the dental setting may trigger a physiological response, such as increased blood pressure or heart rate. The patient may misconstrue it as a real threat, leading to catastrophic thoughts in the dental setting. This, in turn, nurtures feelings of threat and horror, leading to a sensation of panic beyond their control (Clark, 1986).

1.3 Vulnerable group's oral health and dental anxiety

The dental setting may trigger a response defence for patients with a history of abuse or torture because the setting and dental procedures could mimic their past traumas. The following sections describe abuse and torture survivors' oral health and associated dental anxiety.

1.3.1 The oral health and anxiety of abuse survivors

Descriptive studies on child abuse reveal that abuse survivors tend to have poor oral health. Drawn from a Swedish context, children who are abuse survivors scored higher on dental caries, permanent dentitions and dental treatments than nonabuse survivors (Kvist et al., 2018). In an

American context, Akinkugbe et al. (2019) found that a history of abuse was associated with postponing dental examinations and having ≥ 6 teeth extracted. In their sample of 86 children, 30 portrayed dental neglect and 56 dental service avoidance behaviour (significant for both).

An early study by Walker et al. (1996) uncovered an association between sexual, physical and emotional abuse and dental anxiety. The association between dental anxiety and abuse has also been studied in the Norwegian setting (Willumsen, 2001, 2004). In a cross-sectional study, women were categorised into three abuse groups: sexual touching, intercourse or oral penetration. Data analyses showed that dental anxiety was significantly higher across all groups when compared to the general Norwegian population (Willumsen, 2001).

A recent national report describes the prevalence of abuse in Norway. From a patient pool of 4299, 18% reported at least one incident of sexual abuse. Combining the different types of abuse, the report concludes that around one in four adults are abuse survivors (Dale et al., 2023). Such prevalence suggests that dental practitioners are likely to engage with abuse survivors. Larijani and Guggisberg's (2015) comprehensive review examined the effects of sexual abuse on dental anxiety, uncovering triggers that dental practitioners can look out for when engaging with abuse survivors. The review identified seven quantitative, one mixed-method and two qualitative studies from 1995 to 2011 from Norway (2), Germany (2), the United States (2), Canada (1), the Netherlands (1), the United Kingdom (1) and Denmark (1). The review concluded that sexual abuse survivors avoid dental services because the dental setting leads to feeling a loss of control, powerless and helpless (Larijani & Guggisberg, 2015). Moreover, abuse survivors exhibit major psychological restraints in the dental encounter because they trigger memories from their abuse (Leeners et al., 2007). These triggers include the placement of the body, physical contact and dental instruments placed in their mouths (Leeners et al., 2007). Additional triggers identified include the smell of latex from gloves used to inspect the

mouth, the embarrassment or fear of being judged and criticised, and body positions (Moore et al., 2004; Stalker et al., 2005).

A more recent study by Wolf et al. (2020) examined abuse survivors' psychological and physiological effects from dental encounters. Based on interviews with 13 abuse survivors, the study found that dental encounters triggered psychological stress reactions by mimicking abuse episodes. The study also found that regular routines in which dental practitioners engage, such as touching the patients' faces, were challenging for patients to tolerate (Wolf et al., 2020), echoing earlier studies (Leeners et al., 2007). Both Leeners et al. (2007) and Wolf et al. (2020) suggest that dental staff could facilitate the dental encounter by being aware of patients' abuse history, by learning and recognising patients' defence mechanisms and by pairing female abuse survivors with female dental staff. Furthermore, a recent qualitative study on facilitating abuse survivors in the dental setting found that specific steps were needed to make dental encounter achievable (Kranstad et al., 2019). First, the study found that dental procedures need to start in a good way, meaning that the reception needs to feel warm and welcoming, and appointments need to address patients' individual needs and be frequent. The dental practitioner needs to be competent in providing quality-assured dentistry, conscious of how patients' abuse history interplays in the setting and wary of their behaviour, body language and attitude throughout the sessions. Lastly, dental practitioners need to build a safe relationship and treatment setting that explores the individual patient's triggers in the dental environment (Kranstad et al., 2019).

1.3.2 The oral health and dental anxiety of torture survivors

Descriptive pathology and examination studies depict dental torture, head trauma and asphyxiation as prevailing torture methods affecting the head and mouth region (Herath & Pollanen, 2017; Pollanen, 2018). Dental torture involves breaking teeth or running electrical currents into

the teeth. Head trauma is associated with blows to the face and surrounding regions, often leading to swelling or fractures that affect jaw and neck mobility. Asphyxiation relates to suffocating the victim by gagging, choking with a plastic bag enclosing the head, obstructing the nose and mouth and strangulation (Herath & Pollanen, 2017; Pollanen, 2018). Gingival swelling and bleeding are not uncommon results of dental torture or dental neglect (Pollanen, 2018; Singh et al., 2008).

Although it is known that torture methods tend to involve the head and mouth region, research on this population and its relationship to oral health and dental attendance remains scarce. A descriptive study assessing the oral health status of torture refugees fleeing to the United States indicated that 90% of their sample (N = 216) needed near-immediate dental care, 20% suffered from moderate to severe gingivitis and 76% had untreated dental caries. Based on subjective reporting, 30% described having dental pain (Singh et al., 2008). A more recent systematic review assessing dental caries disease among refugees in Europe found the prevalence of dental disease ranged from 50% to 100% (Bhusari et al., 2020).

A history of torture is not uncommon for refugees. Høyvik et al. (2018) found that half of their sample of 173 refugees in Norway were torture survivors. The countries of refugees varied, but Eritrea, Syria and Somalia were overrepresented. Through regression analyses, the study found that torture survivors scored 6.1 times higher on dental anxiety than nontortured refugees. If they suffered from comorbidity, such as post-traumatic stress disorder (PTSD) and dental anxiety, they were 9.1 times more dentally anxious than nontorture refugees. Thirty-five per cent of the tortured refugees reported torture methods directed at their mouth region and 23% at their teeth (Høyvik et al., 2018). Other factors, beyond dental anxiety, could impact torture refugees' ability to attend to their oral health. A qualitative study investigating the oral health of tortured Hazares refugees fleeing to Australia found that the hazardous environment from which refugees flee and their cultural background

could be risk factors for a diminished priority to attend to their dental care. The findings of the study indicated that primal needs, such as food and security, were more important than restoring or checking their dental health (Lamb et al., 2009). However, a recent qualitative study exploring the dynamics between torture survivors and the dental care setting disputes this (Høyvik et al., 2021). The study's analyses of 10 in-depth interviews with torture survivors revealed a strong desire to treat oral diseases. Barriers such as access, money and language hindered their dental service attendance. Moreover, this study also found that traumatic memory could be triggered during the dental encounter, which impacted torture survivors' ability to maintain control, leading to unpleasant bodily, mental and emotional sensations (Høyvik et al., 2021).

1.4 Treating dental anxiety

One way to overcome dental anxiety in the dental setting is to administer a pharmacological option (Hauge et al., 2021), which include sedatives or anaesthetics that either depress the central nervous system or block pain receptors. Sedation options vary from conscious to deep sedation, annotating the level of conscious suppression. General anaesthetics or deep sedation implies that the patient is entirely unconscious and will not respond if aroused (Kapur & Kapur, 2018). The deep state of sedation and general anaesthetics deviate from local anaesthetics—the medication used locally to numb a specific area in the oral cavity and used by most patients (anxious or not) to avoid procedural pain.

Patients with dental anxiety tend to respond differently to sedative options than patients who are not dentally anxious, with the presumption that sedatives are less effective when anxiety increases (Appukuttan, 2016; Hargreaves & Keiser, 2002). Some also prescribe a failure of sedatives and pain receptors for dentally anxious patients to the patient's strong fear of losing control in the dental chair—that being sedated would enhance their feeling of control loss (Raadal, 2013). If

pharmaceuticals fail to block the pain and their fear of losing control is intensified, the patient's anxiety may intensify, incentivising the avoidance aspect. Thus, Appukuttan (2016) advises that patients with severe dental anxiety who need to undergo extensive and complex dental procedures do this under general anaesthetics.

In contrast to the previous studies, Hauge et al. (2021) propose that providing patients with sedative benzodiazepine (midazolam) and a behavioural approach is effective in alleviating dental anxiety. Their randomised control study examined the effect of dentist-administered cognitive behavioural therapy (CBT) compared to a control group that received a behavioural approach (the Four Habits Model) and sedation (midazolam) on patients with moderate to severe dental anxiety. DAS totals dropped for both groups, indicating that a behavioural approach combined with sedation is an effective treatment for dental anxiety.

The desire to treat dental anxiety has led the dental field towards the psychological domain in search of an intervention procedure that can alter human behaviour. Psychology, the scientific study of human behaviour, the mind, internal states, and processes, treaded into dentistry in the 1940s (Holt et al., 2019a; Ayer, 2011). From published books and monographs, Ayer (2011) depicts how psychology in dentistry changed from being prescriptive, looking for specific recipes to alter human behaviour, to a behavioural and social approach in the 1970s, that incorporated CBT to treat patients with phobia.

1.4.1 Cognitive behavioural therapy

CBT is a psychological treatment that combines behavioural and cognitive theory (Holt et al., 2019a). CBT was, and still is by many, considered appealing in its preciseness and briefness compared to other psychotherapies (Bergin & Garfield, 2004). Thus, CBT tends to dominate in psychotherapy (David et al., 2018; Holt et al., 2019a; Bergin & Garfield, 2004).

The theory behind CBT is that our thoughts (cognition) impact our emotions and behaviours, and that maladaptive cognitions can lead to distressing and dysfunctional behaviours and emotions. The therapy works around identifying the distressing thoughts, and the therapy works with challenging these thoughts to understand how (un)realistic they are. By challenging these distressing thoughts, the therapy works towards altering the cognition around them and initiating behavioural and emotional changes towards them (Beck, 2011; Bergin & Garfield, 2004; Holt., 2019a).

There is considerable variation in CBT treatment pathways, which reflects the need to tailor the therapy towards the individual. Yet, they all centre on producing change by influencing the thought process (Bergin & Garfield, 2004). Moreover, Beck (2011) proposes ten basic principles, guiding all behaviour change for patients:

1. A constant formulation of patients' problems and conceptualizing this in cognitive terms
2. Building a therapeutic alliance
3. Active participation and collaborative work between patient and therapist
4. Goal oriented; problem focused on testing thoughts through behavioural experiments
5. Emphasizing the present; focusing on the here-and-now
6. Education; teaching the patient to be their own therapist
7. Time limited number of sessions
8. Structure; a format of the session that generates predictability
9. Teaching the patient to identify, evaluate and respond to their maladaptive beliefs
10. Varying in techniques to alter the cognition, emotion and behaviour

The basic principles outlined by Beck (2011) are assumed to apply to all patients, although the patient's needs, capability and disorder dictate the

treatment. CBT was initially intended to treat depression but has also been evidenced to alter patients' cognition towards dental anxiety-provoking stimuli (Beck, 2020; Gordon et al., 2013; Kvale et al., 2004; Wide Boman et al., 2013). For anxiety disorders, CBT emphasises on uncovering and testing patients' catastrophic and maladaptive thoughts. A therapeutic component here is exposure, which allows the patient to confront their fear stimuli in a safe environment (Abramowitz et al., 2019). This thesis is concerned with understanding dental anxiety; thus, the focus has naturally fallen to the exposure element of CBT. This is further elaborated in section 7.3.

This paragraph illustrates how the exposure element of CBT intends to alleviate dental anxiety by using a TADA patient as an example. The TADA patient avoided dental services (maladaptive behaviour), linking it to fear of the drill and the waiting room. Section 2.3 explains a typical approach to treating the specific fear stimuli related to the drill. Thus, this example focuses on the fear towards the dental offices' waiting room. Through consultations, the service learned that the patient's fear linked to the waiting room was that she would die from slipping on water that could drip from the water station (a dysfunctional cognition). The patient's exaggerated thought affected her perception of the dental office and was distressing and exhaustive and led to an avoidance behaviour. For this patient, the therapy worked towards altering her cognition related to the dental setting by exploring her catastrophic thoughts related to the waiting area and gradually exposing her to it. This involved sitting and increasing time in the waiting area, walking towards the water station and finally collecting water. For this specific patient, the exposure therapy worked *gradually* towards each fear stimulus (the drill and waiting area), with the assumption that if her cognition changed (belief system and thinking), her distress (emotional) and avoidance (behavioural) would also change. The patient explained that her service pathway had been successful for her.

The literature depicts CBT as a therapy of choice that effectively alleviates dental anxiety. A critical review by Gordon et al. (2013) and a meta-analysis by Kvale et al. (2004) revealed that various CBT techniques significantly alleviate dental anxiety. The critical review by Gordon et al. (2013) included 22 treatment trials published between 1974 and 2012, and treatment options varied from music distraction, hypnotherapy, acupuncture, sedatives and essential oils (Karst et al., 2007; Kritsidima et al., 2010; Lahmann et al., 2008). The CBT variations included elements of behavioural therapy, variations of exposure, relaxation techniques and cognitive restructuring. Session intervals, varying between twice weekly for two weeks and once weekly for four weeks and including sessions ranging from one to five hours, showed significantly reduced dental anxiety and increased dental attendance, irrespectively (De Jongh et al., 1995; Haukebø et al., 2008; Ning & Liddell, 1991; Vika et al., 2009). CBT performed better on treatment outcomes than non-CBT treatment options using sedatives (benzodiazepines; Thom et al., 2000).

A systematic review by Wide Boman et al. (2013) identified and analysed 10 randomised control studies measuring the effect of behavioural dental anxiety treatment interventions for adults with dental phobia or dental anxiety. In line with the two previous reviews, this systematic review also concluded that patients with dental anxiety would benefit from CBT, as it makes them more susceptible to dental treatment, indicating that it is a potential treatment for dental service avoidance behaviour (Wide Boman et al., 2013).

Thus, the reviews provide a strong argument for choosing CBT to alleviate dental anxiety. The literature builds on this and reveals, through quantitative studies, that dental practitioners successfully alleviate dental anxiety by administering CBT (De Jongh et al., 1995; Gatchel, 1980; Haukebø et al., 2008; Lahmann et al., 2008; Lillehaug Agdal et al., 2008; Vika et al., 2009). However, exactly *how* CBT is adopted into practice

and *how* dental practitioners successfully alter their focus from oral to psychological needs to be studied.

In summary, the research presented in this chapter reveals that good oral health is essential and that people with severe dental anxiety or a history of trauma, such as abuse or torture, struggle with poor oral health and attending dental services. The literature shows that CBT works to treat dental anxiety and that dental practitioners may successfully facilitate treatment delivery. However, reviewing the literature has also pointed to knowledge gaps in the CBT practice setting and in dental practitioners' role in delivering CBT. This leaves us questioning how dental practitioners are adopting the psychological intervention and how the service delivery side is incorporating CBT as a psychological intervention for alleviating dental anxiety.

This study contributes to the knowledge gap regarding how dental practitioners adopt CBT to alleviate dental anxiety and how service delivery incorporates CBT by investigating the practice of the TADA service. The TADA service is a specific dental anxiety service in which dental practitioners facilitate alleviating dental anxiety through CBT for torture, abuse and dental phobia patients in Norway. To contribute to the knowledge gap, the aim of the study is to develop (programme) theory of what works within a dental anxiety service (TADA) catering to abuse and torture survivors and dental phobia works, how and why.

2 The TADA service

Reports indicate that people are generally satisfied with dental service delivery in Nordic countries (Välfärdsbarometeren [The Welfare Barometer], 2020). However, marginalised groups within society struggle with regular service attendance (Abrahamsson et al., 2001; Vikum et al., 2012). In 2010, the Norwegian government identified the vulnerability of torture and abuse survivors and patients with dental phobia, which could affect their use of the existing general dental services (Norwegian Directorate of Health, 2010). As a response, a stakeholder group of psychologists, dental practitioners and researchers with expertise in dental anxiety was summoned to develop a service that could cater to torture, abuse survivors and patients with dental phobia.

Dental anxiety was considered the precursor for this specific patient group. Thus, the stakeholder group assumed that, by alleviating dental anxiety for patients with a history of torture, abuse or dental phobia, these patients would return to regular dental services. With this, the TADA (torture, abuse and dental anxiety) service was co-created (Norwegian Directorate of Health, 2010). The TADA service chose CBT, relying on the component of exposure therapy, as a therapeutic intervention to alleviate dental anxiety before restoring patients' oral health. Although CBT is a preferred treatment choice for treating dental anxiety, a search through the literature depicts the TADA service as unique in its bidimensional approach to treating dental anxiety and restoring dentition for its specific patient group.

For a contextual understanding of the TADA service, the following sections outline the TADA service inclusion criteria, the increased service subsidisation and the service approach.

2.1 Service inclusion criteria

Patients are eligible for the TADA service if they report a history of abuse or torture or meet the diagnostical criteria of dental phobia outlined in the DSM-V. Reporting their history of abuse, torture or meeting the diagnostical criteria of dental phobia takes place in the first service session with the psychologist (see Figure 2 in Paper 1, "Exploring the Contexts, Mechanisms and Outcomes of a Torture, Abuse and Dental Anxiety Service in Norway"), which depicts the TADA service architecture and pathways).

Service documents (Norwegian Directorate of Health, 2010) define abuse survivors as covering sexual abuse and/or violence. According to service documents, sexual abuse can be a series of repetitive incidents over time or a single episode challenging a person's dental encounter. Sexual abuse or assault covers all forms of coercion or violence that lead a person to actively or passively participate in acts of a sexual nature. Assault covers violence in close relationships in which trust between parties is built that leads the perpetrator and victim to hold a specific obligation between and dependence on each other. This term also covers children vicariously subjected to violence, such as witnessing violence between parents. TADA service documents explain that acute reactions and psychological or somatic disorders can arise from such scenarios. Violence in close relationships often repeats over time. Thus, the assessment needs to consider the sum of the actions that constitute the offence, which can result in trauma and allow for service inclusion.

Although sexual abuse is not an uncommon torture method (Herath & Pollanen, 2017; Høyvik et al., 2018; Pollanen, 2018), the TADA service distinguishes the two in their inclusion criteria. Torture criteria for service admission include having direct damage to the mouth and teeth caused by the direct application of pain and injuries, that is, direct dental torture. Additionally, torture methods include forced intake of harmful fluids (e.g. urine or similar liquids), poor and inadequate nutrition over

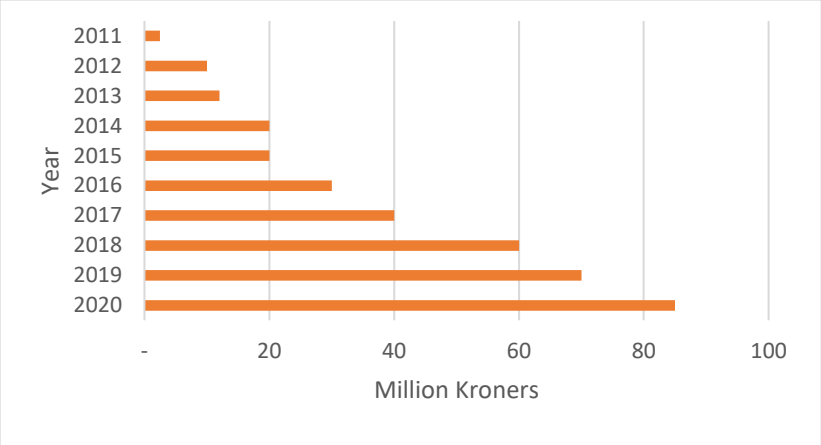
time, severe deficiencies in hygiene conditions, and rear bonding or other forms of physical restriction that making dental care impossible. The experiences of torture, particularly those with dental torture carried out, for example, in dental chairs and with equipment like dental tools, can lead to a fear of seeking dental help and result in oral pathologies. In addition, the general psychological conditions after torture and the likelihood of PTSD, depression, apathy and abandonment can lead to a general attitude in which dental care and other personal care are a low priority. Thus, this group is prioritised to receive TADA treatment.

Although the three patient groups comprising the TADA service are different, The TADA service focuses only on their commonality: having dental anxiety. Treating these patients' dental anxiety is thus the focal point of the service. Nonetheless, the service accepts that there are individual differences; patient heterogeneity. Figure 2 in Paper 1 (Exploring the Context, Mechanisms and Outcomes) depicts how the service accommodates heterogeneity by having flexible service pathways and incorporating additional treatment.

2.2 A subsidised service

The TADA service is a government-subsidised service with an earmarked yearly budget. Subsidising the service means that anxiety treatment and dental restoration are free for eligible patients. Based on parliamentary bills, this yearly budget increased from 2.5 million kroner in 2011 to 85 million kroner in 2020 (Figure 1). The service pays for TADA team salaries. Thus, a rise in the yearly budget can be attributed to increased teams across the nation.

Figure 1. TADA yearly budget increase



The TADA service is a national service, with interdisciplinary teams allocated in each county. As of 2018, 52 interdisciplinary teams represented the TADA service. By regulating national guidelines and funding procedures, the Directorate of Health strives to deliver the same service across the country. Nevertheless, in Norway, dental health devolves to the county level. Thus, each county is responsible for recruiting and educating staff for the TADA service and for utilising resources.

2.3 TADA's service approach

The TADA service takes an interdisciplinary approach by combining the professions of psychology and dentistry to treat dental anxiety. The TADA psychologist oversees patient admission based on the service inclusion criteria (Section 2.1), assesses the patient's motivation for CBT and oversees the CBT treatment procedures that the dental practitioner administers. The dental practitioners in the TADA teams deliver in-vivo exposure therapy, a component of CBT. Exposure therapy is a gradual and hierarchically anxiety-provoking therapeutic intervention with the aim of disconfirming patients' maladaptive beliefs (Abramowitz et al., 2019). In practice, this means that the dental practitioners gradually expose the patients to anxiety-provoking stimuli in the dental setting to reduce the anxiety-provoking responses. Thus, the first session involves exposing the patient to a trigger object that activates a tolerable anxiety response. For some patients, this involves holding the drill. The consecutive sessions enhance the exposure to anxiety-provoking stimuli, such as placing the drill in the mouth and increasing its time in the mouth before it is used to treat decay. The assumption is that this gradual exposure desensitises the patients to fear stimuli through direct and active methods (Abramowitz et al., 2019; Choy et al., 2007).

The administration of exposure therapy by dental practitioners is believed to have various benefits. The dental practitioners' presence facilitates the natural and real-world setting and enhances psychoeducation due to their professional education. For example, during exposure, they can explain the reason for the intraoral needle's length and the sharp end of the scaling instrument. In addition, as part of the exposure, the dental practitioners' professional knowledge permits them to perform anxiety-related activities, such as drilling, needle injection or removing calculus from the teeth (Abramowitz et al., 2019).

These anxiety-related activities of the exposure session are direct, active and situational, as they are specific to the in-vivo exposure. Other

exposure methods, such as imaginal and interoceptive, deviate from in-vivo exposure in that patients are not necessarily directly and actively performing tasks in the situation with their fear trigger. For example, imaginal exposure relates to imagining the fear trigger or exposing oneself to fear-evoking thoughts. Interoceptive exposure involves provoking feared bodily sensations, such as breathing through a straw to provoke the sensation of the fear of being breathless. Compared to imaginal and interoceptive exposure modalities, the in-vivo approach outperforms (Wolitzky-Taylor et al., 2008).

Anxiety is an emotion that activates nervous thoughts, feelings of tension and physiological alteration (Holt et al., 2019a). The degree of nervous thoughts, tension and psychological arousal varies; however, when this becomes maladaptive, the anxiety is considered a disorder (Section 2.1). Thus, treatment often involves helping patients learn how to encounter and handle fear. With this premise, Abramowitz et al. (2019) explains that the end goal of an anxiety treatment is not necessarily to become anxiety-free. Instead, anxiety treatment aims for the person to become relaxed and controlled when encountering fear-provoking stimuli, thus allowing them to make rational decisions about what to do and how to react when faced with fear-provoking stimuli (Abramowitz et al., 2019).

When dental practitioners assess patients' dental anxiety as being alleviated, they enter the dental restoration phase of the TADA service. Dental restoration is performed by a follow-up team aiming to restore the patient's teeth to an *acceptable* standard. National guidelines define acceptable oral health as having no pain, discomfort or severe ailments in the oral cavity; having satisfactory chewing functionality; and communicating and participating in social settings without teeth complications (Norwegian Directorate of Health, 2011). This means that there is one interdisciplinary TADA team that focuses on the psychological needs of the patient with the aim of alleviating their dental anxiety and one follow-up team of dental practitioners with the aim of restoring their oral health (Figure 2 in Paper 1, "Exploring the Contexts,

Mechanisms and Outcomes of Torture, Abuse and Dental Anxiety Service in Norway", depicts this). From here on, Paper 1 will be referred to with a shorter title: "Exploring the Contexts, Mechanisms and Outcomes".

2.4 What works within the TADA service, for whom, under what circumstances, how and why

The literature review for this study found that CBT is an effective therapy and a treatment of choice for alleviating dental anxiety (Gordon et al., 2013; Kvale et al., 2004; Wide Boman et al., 2013). Moreover, dental practitioners can play a significant role in alleviating dental anxiety through CBT due to their ability to enhance psychoeducation and perform specific exposure tasks that are intensified by the dental practitioners' presence (Abramowitz et al., 2019). Research supports this and reveals that dental practitioners significantly alleviate patients' dental anxiety either after one or five sessions of delivering CBT (De Jongh et al., 1995; Haukebø et al., 2008; Kvale et al., 2002; Lillehaug Agdal et al., 2008; Vika et al., 2009).

However, the nature of these studies reveals little about how dental practitioners manage the role change required—from focusing on patients' oral needs to their psychological needs—to alleviate dental anxiety and how the practice of incorporating CBT as part of a service delivery works.

Thus, previous research has established that CBT is a therapy that significantly decreases dental anxiety and that dental practitioners can be effective therapists in delivering this. However, a knowledge gap exists about the service practice of CBT regarding *how* services incorporate this intervention into the dental practice and *how* dental practitioners successfully deliver it.

Moreover, the previous literature is limited to studies on CBT's effectiveness in a sample of patients with dental anxiety and dental phobia. This leaves us questioning whether a specific dental service can adopt CBT and alleviate dental anxiety in a heterogenic patient population with dental anxiety and a history of trauma resulting from torture or abuse.

By investigating the TADA service, the current study addresses the knowledge gaps in the role change required by dental practitioners and how services incorporate CBT to cater to torture or abuse survivors or those with dental phobia. By investigating what works within TADA, for whom, under what circumstances, how and why, the current study contributes a service delivery and practice perspective to the existing literature on CBT.

A realist evaluation is a methodological strategy that provides a framework for investigating a service's workings, for whom, under what circumstances, how and why. Thus, choosing to use a realist evaluation approach was natural for investigating TADA. To date, the current study remains unique in using a realist approach to study TADA, and realist evaluations remain few in the Norwegian and dental contexts. Thus, the study contributes methodologically by bringing the realist lens to dentistry and the Norwegian context. The following chapter details what realist evaluations are and how they position themselves scientifically.

3 A realist evaluation

A realist evaluation is a methodological strategy in the scientific realism paradigm (Pawson & Tilley, 1997). This chapter starts by outlining scientific realism while addressing ontological and epistemological underpinnings that follow, before moving on to service complexities. Central to realist evaluations are theories; thus, this chapter ends with the realist take on theories and a presentation of the research process.

3.1 Scientific realism

Scientific realism is a philosophy of both the natural and social sciences that provides a paradigm for understanding reality and how we have come to know this reality (Chernoff, 2007; Jagosh, 2020; Pawson, 2006b). Scientific realism asserts that the world is *real* but that reality is mind-independent and consists of multiple layers—some that are not visible to the blind eye (Dalkin et al., 2015; Pawson & Tilley, 1997). The realist assumes that causal, generative, underlying mechanisms lead to observable outcomes. Pawson (2006b) describes the powers of mechanisms as "the engines of explanation" (p. 23). Thus, *real* observable events are not formed in isolation but by causal regularities. The ontological assumption is that these causal mechanisms will only fire if the context is correct. The premise is that, although there may be universal underlying mechanisms, their context affects whether they will fire or not, resulting in an outcome (Pawson & Tilley, 1997).

Central to realism is that it is not programmes (or services) but rather the people involved who make the programmes work. People, or *actors* in realist jargon, are not isolated but are placed in a broader social context to encounter different resources through experiences and opportunities. Thus, realism operates with an open system, implying that countless factors influence the social explanation of behaviour change. This premise also implies that scientific realism accepts complexity

(elaborated on in Section 3.2). Due to the historical, personal and cultural framework in which actors find themselves, they are bound to have different inclinations, responses and reasonings towards the resources they are presented with (Pawson & Tilley, 1997). From a service perspective, this means that interventions will work differently for the people involved. The assumption is that social outcomes are based on decisions and human volition, and decisions are made from underlying mechanisms, which are context-dependent.

Scientific realism assumes that reality is multiple and can be fallible (Pawson & Tilley, 1997). Hence, the realistic approach to scientific inquiries involves improving the alignment of what is real (ontology) and the construed understanding of how we have come to know this reality (epistemology) by developing and refining theories. Epistemically, realists are concerned with unearthing causal and generative mechanisms through a theory-driven approach. A theory-driven approach implies that a theory drives the research process. How theory drives the research process is outlined in Section 3.3, which describes the realist take on theories.

Scientific realism is in breach because the ideas that provide ontological depth and reveal causal chains can be challenging for evidence (Pawson, 2006b). Thus, tension evolves between tracking the observable evidence and acknowledging that not all can be evidenced. This places scientific realism between positivism and constructivism. Table 1 outlines the differences between paradigms and situates scientific realism somewhere between constructivism and positivism in its perspective.

Table 1: Ontological, epistemological underpinnings of the methodological considerations and choices of methods

Paradigm	**Ontology** *What is reality?*	**Epistemology** *How do we know this reality?*	**Methodology** *Which philosophical underpinning guides us in collecting data that can explain this reality?*	**Method** *Which methods are required to make claims on this reality?*
Positivism	Naïve realism: perceived objects are not representations of objects but are veridical visual experiences of the object (Niikawa, 2014)/	Objectivism: knowledge can be objective and universal by reducing ideology, prejudice and hunches. Biases and inaccuracies are minimised through logical reasoning (Munro, 2014).	Quantifiable, objective and value-free research that is neutral and independent.	Deductive methods are quantifiable observations that are measurable and permit statistical analyses. Typically, experiments and surveys (Alderson, 2021)
Scientific Realism	Mind-independent and stratified into layers. Generative forces at an ontological depth are not directly observable or measurable. Contingent on the context, these mechanisms produce visible and measurable outcomes.	Focuses on unearthing the ontologically deep mechanisms. Outcomes and contexts can be observed and measured.	Theory-driven, guided by developing and refining programme theories that focus on the outcomes of a triggered mechanism in a context.	Methods are chosen based on their ability to inform the theory. The approach is abductive, retroductive and iterative. Multiple sources and multiple stakeholder perspectives are usually used.
Constructivism	Relativism: reality is a subjective experience (Levers, 2013).	Subjectivism: the observer is part of what is being observed.	Naturalism: exploratory, aiming to understand the meanings thereof.	Qualitative instruments that gather rich data. Typically, through interviews and analyses, interpreting the subjects' perceived reality.

3.2 Service complexity

The realist assumption is that services are invented and implemented to achieve a change in social outcomes (Pawson & Tilley, 1997). With the example of TADA, the desired change outcome lies in avoidance behaviour; torture and abuse survivors and patients with dental phobia will no longer avoid general dental services. However, the realist assumption is that services prevail as part of an open system where various contextual levels (macro, meso and micro) could affect multiple and fluctuating outcomes (proximal, distant, long-term, rippled or immediate). The outcomes vary because multiple stakeholders or actors have choices to act upon (volition) within the service parameters and are often affected by long and convoluted implementation chains (Pawson, 2013). Thus, unanticipated intrusions could impact desired service outcomes when operating in open systems, and grasping the entire picture can be challenging (Pawson, 2013; Pawson & Tilley, 1997). To further complicate the matter, social systems are nested (Emmel et al., 2018). For example, TADA patients are complex themselves, but they are also likely to be part of a family household and other institutional social systems that can also be complex.

Realist evaluations accept the complexity because their ontological assumption is that a service (programme) and its social context are complex. Thus, epistemically, part of a realist evaluation is working with this complexity to explain why causal outcomes occur. With this premise, realist evaluation overcomes complexity by focusing on explaining the causal interactions within complexities. To do so, they propose working with the realist formula context + mechanism = outcome (CMO). This realist formula reflects a pragmatic stance towards complex social interventions and assumes that service complexities can be untangled by depicting and explicating how service outcomes are brought about within the specific contexts.

Pawson (2013) outlines a checklist for evaluators to consider before entering the research field to see how the realist approach may fit with the programme complexity. Pawson (2013) refers to this as a complexity checklist, which involves mapping the choices embedded in the service, understanding the implementation chain, preexisting contexts and how timing affects the intervention and considering outcomes, rivalry and emergent effects.

Applying the complexity checklist to the TADA service shows that its heterogenic patient demographic and its assimilation of dental practitioners and psychologists both address the multiple and potential divergent choices embedded in the service architecture. The increase in state subsidisation (section 2.2) reveals a service emergence. Moreover, TADA's geopolitical and infrastructural position (national service yet compartmentalised to county-level distribution) reveals preexisting contexts and that outcomes may occur at multiple levels and in various ways.

This section briefly outlined how realist evaluations accept service complexities and proposed the realist formula CMO to untangle service complexities and account for service workings. It is important for the reader to note that the realist evaluation methodology's ability to accept the TADA service's complexity was also part of the reason for choosing this methodological strategy to study TADA.

3.3 The realist take on theories

According to Pawson (2006a), interventions, such as TADA, are theories that are developed by a service design and operationalised within populations. A realist evaluation methodology takes on the task of articulating and refining the theory of for whom, how and why programmes reach their end goal by explicating a programme theory. Programmes can be specific interventions or services. Therefore, a

programme theory is a set of assumptions about how and why services might work (Pawson & Tilley, 1997).

Theories serve different purposes based on their applicability and abstraction. Realist evaluations focus on programme theories that deviate but can inform grand and middle-range theories. Grand theories are abstracted to a level that can describe large portions of the human experience and become applicable to a large population (Polit & Beck, 2017). Middle-range theories are abstracted to a lower level than grand theories and are more specific to the studied phenomena (Polit & Beck, 2017). Hence, their applicability is mainly limited to the phenomena of inquiry. Lastly, programme theories are concerned with programme parameters and are thus abstracted to a level applicable to the programme (service) populations (Pawson & Tilley, 1997).

Theories are central to realist evaluations, as the whole premise is to develop and refine the programme theory to describe for whom the programme works for, under what circumstances, how and why (Pawson & Tilley, 1997). To do so, the realist evaluation process is theory-driven. By being theory-driven, methods are not favoured, and the goal is not to provide universal truth (Pawson, 2013). Instead, a theory, which is an underlying assumption that provides a probable explanation for the outcome, describes the process of what evidence to collect and how to make inferences from it. All types of evidence can be asserted to everything or anything, from quantitative, measurable data to gossip at the study site. Thus, the ability of a priori knowledge and social sciences to anticipate programme outcomes by compiling all types of evidence to make inferences is valued (Chen & Rossi, 1980).

This section has identified that an underlying theory drives the research process. In realist jargon, this underlying theory is often defined as an initial (rough) programme theory. This initial programme theory may not necessarily be explicit in the minds of the service developers. Hence, part of a realist evaluation is to explicate the implicit theory behind the

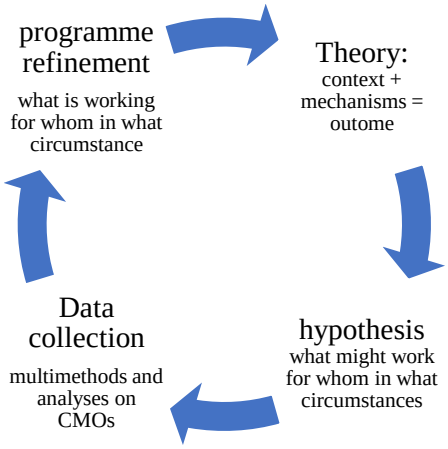
workings of the service. There is no standard on how to elicit or generate initial programme theories. Once the initial programme theory is elicited, the research involves collecting data to refine the theory. The research inquiry therefore works in a cycle (Figure 2). The following section elaborates on the cyclical work in realist evaluations.

3.4 The realist evaluation cycle

Deciding or knowing where to look to answer what works within a service, for whom, in what circumstances, how and why can be difficult when evaluating complex services. Thus, realist evaluations often start by eliciting the initial programme theory through service developers, based on the premise that services are theory incarnate. Conducting a realist synthesis is another way of eliciting the programme theories (Pawson, 2006a, 2006c; Wong et al., 2016).

The data needed to inform or develop the initial programme theory lead the way in designing the research on how to test and further refine the programme theory. Thus, the step following the study's design is to collect data to inform the programme theory. The collected data are then used to revise and refine the programme theory before it can be contested for another round in the research cycle. Figure 2 depicts how Pawson and Tilley (1997) propose the evaluation process as a research cycle, where the programme theory is constantly refined and the service's understanding is continuously enhanced. The assumption is that programme theories can constantly be refined due to the forever-changing context and the inability to grasp all aspects of service complexity. The current study's position within the realist cycle is outlined in Section 3.6.

Figure 2. The realist cycle (Pawson, 2006b, 2013; Pawson & Tilley, 2004).



3.4.1 Context + Mechanism = Outcome

In explicating the programme theory, realist evaluations use the CMO heuristic logic formula (Pawson & Tilley, 1997). The CMO configurations provide the most plausible explanation for the outcomes observed in the study. The CMO heuristics propose what is working (outcome), for whom and in what circumstances (context), how and why (mechanisms). The CMO configurations are often used for analytical purposes, depicting what feeds into the programme theory. The following section addresses each element of the CMO configuration in relation to the analyses. The focus of the CMO configuration lies in the causal forces of programme mechanisms; thus, the mechanisms are explained first.

3.4.2 Programme mechanisms

The mechanisms in evaluation research focus on describing *how* and *why* service outcomes come about (Dalkin et al., 2015). Based on the premise that mechanisms are causal, underlying and at an ontological depth, the realist methodology involves unearthing them (Emmel et al., 2018). To uncover the mechanisms, the researcher asks, “What are the unique

service resources, and how do they impact respondents? What assumptions, beliefs and values influence service actors' takes on resources? What is triggered in the service actors that leads to the observed outcome?"

The above questions reveal that the concept of mechanism holds two features: resources and reasonings. Thus, although the logical formula of realist evaluations is context + mechanism = outcome, researchers can also use the formula resource + context → reasonings = outcomes to explicate and unpick the programme mechanisms. The assumption is that mechanisms are the pairing of resources and reasonings because certain service resources alter the reasonings of service actors (Dalkin et al., 2015; Pawson & Tilley, 1997).

Adapted CMO configurations have also included the heuristics of actors and/or interventions (Mukumbang et al., 2018). Thus, inconsistency exists in how to analytically depict the CMO configuration. The analysis and theory's explanatory power regarding the dyadic take on mechanisms (pairing resources and reasonings) decides whether or not, and how, to depict the mechanisms and CMO configuration. The appended papers reflect this. Paper 1, "Exploring the Contexts, Mechanisms and Outcomes", depicts mechanisms without splitting them into reasonings and resources. Paper 2 ("More Than Just a Dental Practitioner") and Paper 3 ("Seeing the Patient Before the Teeth") present more explanatory power in how service outcomes were reached by explicating specifically what the service resources were, leading to altered reasoning for service actors. Therefore, the current study used two formulas: resource + context → reasonings = outcomes and context + mechanism = outcome.

To illustrate the CMO heuristics, the following sections will use the third CMO configuration outlined in Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes") as an example. This CMO identified *self-reliance* and *protectionism* as mechanisms leading to TADA service

outcomes. The following sections on context and outcomes build on this same configuration, revealing the causal interplay between mechanisms, context and outcomes. Keep in mind that the mechanisms prevail as part of a system. Thus, they alone have little explanatory effect.

3.4.3 Context

This chapter has outlined that, for a mechanism to be triggered, the context must be right. Thus, the mechanisms are context-dependent. Contexts may exist before service implementation and may encourage or restrain service success. For example, the institutional, structural, interrelation or interpersonal context may hinder or aid desired service outcomes (Pawson, 2006b, 2013). Since contexts vary, the assumption is that a service will not necessarily work similarly for all involved. Thus, part of the realist evaluation involves gaining a rich understanding of the context to further understand the different contextual elements that trigger different mechanisms.

Following the example presented in Section 3.4.2 on mechanisms, the programme theory explained that TADA teams became *self-reliant* and *protective* of their work. This was triggered across teams when working in a context where national guidelines were open to interpretation, and teams were catering to a heterogeneous patient group, who also might be in a difficult life situation.

3.4.4 Programme outcomes

In the heuristic sense proposed by Pawson and Tilley (1997), outcomes show how programmes work selectively and in conjunction with mechanisms and contexts. Realist evaluations interchangeably use the terms regularities, outcomes, patterns and associations to denote what the mechanisms lead to (Pawson, 2006a, 2013; Pawson & Tilley, 1997). The current study uses the term “outcome” to describe what the mechanisms lead to. Outcomes are, in essence, what the causal mechanisms in the

programme result in. With the ontological understanding of reality as stratified into layers, the outcomes are often observable and measurable, which is in contrast to mechanisms. Thus, in practice, one often starts with the outcomes and works and moves back to explaining causation and context dependency (this is further elaborated in Section 3.5.3). Understanding the outcome is considered vital for the research to understand programme impacts (Pawson, 2006a; Pawson & Tilley, 1997). Outcomes, successful or unsuccessful, immediate, long-term or rippled, intended or unintended, hold the potential to guide future implementations.

Following the examples presented in Section 3.4.2 and 3.4.3, service teams become self-reliant and protective of their work when catering to a heterogeneous patient group and to patients who might be in difficult life situations where guidelines are open to interpretation. The self-reliance and protectionist attitude towards their work lead to cohesive service teams that are isolated from other regional and national teams.

3.5 Methodological choices

The realist evaluation methodology is a scientific strategy for developing and refining programme theories to explain what works for whom under what circumstances (Pawson & Tilley, 1997). This chapter outlines the current study's choices within methods and analyses, while also outlining the interview techniques. This chapter closes by depicting the research process of the current study, using the research cycle proposed by Pawson and Tilley (1997) as a template.

3.5.1 Multi- and qualitative methods

This study consisted of two phases. The first phase involved developing the theory through a developer and deliverer perspective (Paper 1, "Exploring the Contexts, Mechanisms and Outcomes", and Paper 2, "More Than Just a Dental Practitioner"). The study's second phase

entailed testing this theory with patients to refine the programme theory to include patients' perspectives (Paper 3, "Seeing the Person Before the Teeth"). As revealed in the realist cycle (Figure 2, Section 3.4) proposed by Pawson and Tilley (1997), theory refinement is a step that follows from data collection and analysis. How the second phase of the study refined the theory using the patient perspective is depicted in Figure 3 (Section 3.6), which outlines the current study process.

Methodologically, realist evaluations are guided by a theory. Thus, for the first phase of the study, which involved developing the TADA programme theory, an initial rough theory had to be present. This initial, rough programme theory is similar to what quantitative researchers describe as a working hypothesis. Since the literature review for the study revealed that TADA was unique in its service delivery and for its heterogeneous patient group, the initial rough programme theory was drawn from an early government document by the Norwegian Directorate of Health (2010). The theory reads: *CBT delivered by dental practitioners will alleviate the dental anxiety for patients with a history of torture, abuse or dental phobia, allowing them to return to regular dental services.* On the premise that services are theory incarnate, the theory was further developed by including data from service developers and service documents. The study chose to use qualitative methods, to collect data from documents and interviews, in the first phase of the study allowing the study lean on inductive elements and be exploratory in the pursuit of developing the programme theory of TADA (Paper 1, "Exploring the Contexts, Mechanisms and Outcomes", and Paper 2, "More Than Just a Dental Practitioner"). The study describes this phase as using a sequential multimethod design rather than a mixed-methods design because the type of data is solely qualitative (Morse, 2003; Schoonenboom & Johnson, 2017). By including multiple methods, as opposed to singular methods, the data were enriched, *sources* were triangulated, and the study phase gained a broader historical understanding (Morse, 2003).

The last phase of the study, which included testing and refining the theory by adding patients' perspectives, took a qualitative approach. A qualitative approach was deemed beneficial in that it provided the research with rich, detailed and personal takes on service experiences, allowing the researcher to dig for service mechanisms (Paper 3, "Seeing the Person Before the Teeth").

There was little to no research on the TADA service at the time of data collection. Thus, although it could have been effective also to integrate quantitative methods, allowing the study to become mixed methods, it was deemed more fruitful for theory development to only collect qualitative data allowing the study to learn and explore the TADA programme theory. The research team saw the need for gaining a deeper insight of *what* is it that is working, rather than collecting quantifiable data on potential outcomes. However, the data generated from the current approach may be valuable to further validate, falsify, and modify (Pawson & Tilley, 1997), with quantifiable methods, which is raised in chapter 9 in this thesis.

3.5.2 Interviews

Interviews are considered the primary tool for obtaining data on programme effectiveness in the developmental approach in evaluation research (Manzano, 2016) and are used to 'inspire/validate/falsify/modify' theories of programmes (Pawson & Tilley, 1997).

Pawson and Tilley (1997) explain that various actors engaged in a service have different expertise about its workings. Thus, three main questions should drive the data collection in a realist evaluation: first, "what is to know", which leads to "who might know it", and third, "how to ask about it". This involves mapping "who knows what". From a realist perspective, research participants are considered stakeholders - experts whose views are sought (Manzano, 2016). For the first phase of

the study (developing the programme theory, Paper 1, “Exploring the Contexts, Mechanisms and Outcomes”), 14 stakeholders were identified as holding key information allowing the study to develop the programme theory. Specifically, these stakeholders were believed to hold expertise on the contextual landscape in which TADA was implemented, the service design of TADA and the (desired) outcomes. Twelve of these 14 stakeholders agreed to participate in the study, leading to 11 interviews (as two participated in the same interview). These stakeholders reflected service expertise nationally and held professions in psychology or dentistry. Notably, the TADA service is stakeholder-driven. Thus, the stakeholders who developed the service also deliver it. Therefore, the data collected from interviews with these stakeholders reflected both a developer and deliverer perspective (Paper 2, “More Than Just a Dental Practitioner”). The interview schedule for collecting data from the developer and deliverer perspective is added as appendix 1.

The last phase of the study involved interviews with patients in testing and refining the programme theory through patients' perspectives (Paper 3, “Seeing the Person Before the Teeth”). The study interviewed patients to clarify mechanisms leading to the service outcome based on the assumption that patients are most sensitised to the programme mechanisms from their personal take on the outcome (Pawson & Tilley, 1997). Fifteen patients were recruited within one specific county in Norway. The study was interested in understanding the outcome of "alleviated anxiety". Thus, patients were recruited at the intersection were TADA teams assume their anxiety is alleviated, which is prior to patients dental restoration phase (see Figure 2 in Paper 1, “Exploring the Contexts, Mechanisms and Outcomes”). Ethical concerns were also reasons for interviewing patients at this stage, which is elaborated on in Section 5.2. The patients' interview schedule is outlined in Paper 3 (“Seeing the Person Before the Teeth”).

Interviewing in realist evaluations aims to develop and refine programme theories by searching for CMOs. Thus, essential to realist interviews is

to focus on aspects of the service programmes, how, to whom, why and where they are or are not effective by capturing the programme story (Wong et al., 2016). A realist interview also aims to gain ontological depths through which the underlying reasonings for behaviours will arise (unearthing mechanisms). To gain ontological depth, the interviewer constantly reflects on what is being such to come with follow-up questions that dig deeper and seeks the granular details. For this study, this was enhanced by probing questions such as "Why do you think it is like this" and "Is it like this for all patients?". Beyond this, the realist evaluation strategy seems to lack an authoritative guide on using interview methods (Manzano, 2016; Greenhalgh & Manzano, 2021).

However, some scholars propose explicitly presenting one's theories and having stakeholders reflect on them (Manzano, 2016; Mukumbang et al., 2020; Pawson & Tilley, 1997). Such an approach also emphasizes re-engaging with stakeholders to follow up on the theory development and consolidate with them throughout the process, highlighting a teacher-learner technique (Manzano, 2016; Pawson & Tilley, 1997). The teacher–learner technique is a process that works as a cycle. It involves a role reversal in that the interviewer teaches the stakeholder their current understanding of the programme before the interviewee consolidates with further insights, allowing the programme theory to be refined or refuted.

When data is collected, it is in the hands of the participants. The quality of the data extracted from this collection phase depends on the relationship between the participant and the researcher (Karnieli-Miller et al., 2009). While the interviewer initiates the interview, the participants own the story being shared; thus, they control the data transferred. Thus, the current study hypothesised that presenting preliminary programme theories could affect their ownership of their stories and feared that stakeholders would feel evaluated or that patients would become re-traumatized. Therefore, for the current study, stakeholders were not presented with preliminary programme theories

during the interviews. The assumption was that explicitly presenting preliminary programme theories could lead stakeholders (service developers) to agree with the theories, thus being biased by social desirability to satisfy the norm of helping vulnerable patients (Grimm, 2010). Patients were not presented with preliminary programme theories to avoid any power imbalance during interviews considering the ethical responsibility due to their vulnerability (further elaborated in section 5.2). Instead of presenting interviewees with a set of programme theories, the interview schedule was flexible and contained questions exploring stakeholders' takes on the developing theory. This meant creating open-ended questions around predefined themes and, where appropriate, targeting follow-up questions exploring their experiences with this topic that resembled fragments of working programme theories. The interview technique mirrored a dyadic take of preliminary and working theories, as described by Jackson and Kolla (2012). Notably, realist interviews that explicitly present stakeholders with their preliminary programme theories are underrepresented (Mukumbang et al., 2020).

Moreover, the study's approach to interviewing deviates from the more traditional realist interview approaches suggested by Pawson & Tilley's (1997) seminal work and Manzano (2016), as stakeholders were not met for follow-up interviews to consolidate the theory development due to busy schedules and stakeholders having scattered locations. Also, using a semi-structured guide that took a flexible approach for theory development and not re-engaging with stakeholders, meant the teacher-learner approach emphasised by Pawson & Tilley (1997) was compromised.

Realist scholars accept the difficulties with re-engaging with stakeholders (Manzano, 2016; Emmel, 2013) and address that it is not the number of stakeholders or interviews conducted that is important, but instead focusing on the "who", "why", and "how", such to understand

programme participants understanding of the service to build and develop the theory from this.

3.5.3 Analyses

By analysing the data, we can produce meaning from what the data collection have captured. Analytical choices affect how this meaning-making occurs and what it gives rise to. For realist evaluations, there is no standard for analytical procedures to develop and test programme theories (Haynes et al., 2021). Nevertheless, since the programme theory is the unit of analysis (Dalkin et al., 2015), a heuristic is analytically expressed as a CMO configuration or an adapted version of the analyses. It is, therefore, advantageous for the analytical procedure that people tend to think and reflect in realist ways when asked causative questions, such as "Why did this happen?" or "How did this come about?" The following section describes which analytical tools were used for theory development and refinement.

The study used two different analyses to develop and refine the programme theory. Different analyses were chosen based on their ability to facilitate the theory's development or refine the theory. In the first phase of the study (developing the programme theory), the collected data were analysed through a direct content analysis approach, as described by Hsieh and Shannon (2005), and included CMO heuristics. First, the data material (interview transcripts and service documents) was read multiple times to attain a sense of wholeness before assigning code names to text portions describing the data. After the data had been coded, the codes were catalogued as either context, mechanisms or outcome, exposing their area of insight. Lastly, the configuration took place, which entailed working backwards from the identified outcomes and searching for their causal explanations of how they came about. This involved theorising and going back and forth to the data material. Figure 1 in Paper 1, "Exploring the Contexts, Mechanisms and Outcomes", depicts steps of coding and cataloguing, with an example from a policy

document. As for developing theory from the deliverer's perspective, the formula was altered, as there was more explanatory power in splitting the mechanism into resources and reasonings (Dalkin et al., 2015). The dyadic take on mechanisms was a helpful analytical and heuristic tool when analysing the data from the deliverer perspective in that it explicated which specific service resources attributed to a change in reasonings. For example, this analytical heuristic explicated how the *resource* of time, provided in the institutional context of TADA, altered dental practitioners' *reasonings* for displaying patience and flexibility (Tables 3–5 in Paper 2, "More Than Just a Dental Practitioner", depicts this).

Content analyses are increasingly popular in health research, often ascribed to their flexibility (Hsieh & Shannon, 2005). A direct approach within content analyses opens up existing theories describing the phenomenon, allowing them to be built upon, which is valuable for the theory-driven aspect of realist evaluations. Furthermore, the direct approach of content analyses allows the researcher to categorise areas of insight into what they represent. This was especially useful for including the CMO heuristics as part of the analyses by categorising codes as contexts, mechanisms and outcomes.

The last phase of the study (refining the theory by including the patient perspective) followed a template analysis proposed by Brooks et al. (2015) and included a CMO heuristic. Although the content analysis permitted flexibility and added theory to the analytical process, a template analysis was more appealing due to its coding structure, which used a priori themes as an initial template. The first step of the template analyses was to become familiar with the text before applying a priori codes, which were guided by the previous phase (deliverer perspective, as outlined in Paper 2, "More Than Just a Dental Practitioner"). This involved reading the collected data material before applying the codes as an initial template for the analyses. Halfway through the analyses, this template was modified to better fit the collected data material and to

better represent the patient perspective (Figure 1 in Paper 3, "Seeing the Patient Before the Teeth", depicts the template modification). This modified template was then used for the entire data set. As with content analysis, the template analysis was deemed beneficial in its ability to enable a flexible approach to tailoring the analytical steps to the study's requirements, by incorporating theory and the use of the template (Hsieh & Shannon, 2005; King, 2012). This was especially helpful in disaggregating the resources and reasonings as part of the mechanism.

The content and template analyses took an iterative, abductive and retroductive approach. The abductive approach relies on both induction and deduction principles. The abductive process, like induction, starts from an empirical basis while considering theoretical preconceptions, such as deduction. Thus, the process involves alternating between the initial rough programme theory and new empirical data, both of which are understood in light of the other (Alvesson & Skoldberg, 2018). The retroductive approach entailed theorising beyond observable outcomes, considering new and emerging explanations and asking how the landscape must be for TADA to be implemented and for it to have its effects, while rethinking and refuting older theories and assumptions (Alderson, 2021; Jagosh, 2020). The iterative process involved going back and forth to the data material while theorising with the retroductive approach in the pursuit of validating "hunches" (realist jargon for insights). The analysis was therefore not a linear process and became quite messy and complicated. To resolve chaos, the researcher kept a research diary, which tracked the process and enhanced reflexivity (elaborated in Section 4.3.1). Lastly, the analytical process incorporated rival theories to enhance confirmability (Section 4.1.4) and theory sensitivity. Rival theories were added by juxtaposing the context, mechanisms or outcomes to offer various scenarios for the service outcomes. Tables 3, 4 and 5 in Paper 2 ("More Than Just a Dental Practitioner") uncover how the TADA service's context was juxtaposed from the regular dental setting.

3.6 The study process

This thesis outlines the realist research cycle in Section 3.4, in which an initial programme theory starts the evaluation cycle that guides the methodological choices of where to collect data and from whom. This section aims to depict the current study's research process using the template proposed by Pawson and Tilley (1997). To make meaning of the research process for the current study depicted in Figure 3, large portions of the text in this section are reiterated from the previous sections.

The initial programme theory for the current study was elicited from an early national government document describing the TADA service (Norwegian Directorate of Health, 2010). Service developers were recruited, and service documents were collected to further develop the programme theory. The TADA service was a stakeholder lead; developers held additional roles as service deliverers. Their dual roles were unveiled in the data, reflecting both the developer and deliverer perspectives of what works within TADA, for whom, under what circumstances, how and why. Therefore, the multimethod design of the first phase of the study led to four programme theories depicting structural features (developer perspective, Paper 1, "Exploring the Contexts, Mechanisms and Outcomes") and three programme theories explaining the relational elements (deliverer perspective, Paper 2, "More Than Just a Dental Practitioner") of TADA. The programme theories were then tested and refined through patient interviews and a template analysis (Paper 3, "Seeing the Person Before the Teeth"). Figure 3 displays the research process of the study by adopting the realist evaluation cycle proposed by Pawson and Tilley (1997). Figure 3 depicts two loops representing various phases of data collection. Moreover, the research process from the current study deviates from Pawson and Tilley's (1997) cycle, in that it does not go full cycle. By not going full cycle, the current study implies that the programme theories can be used for future studies to test them in various cases. The way forward,

continuing the cycle, is outlined in Chapter 9, on future research. Lastly, the refined programme theories are depicted in the figure as condensed text extracted from each programme theory. Thus, the programme theories in Figure 3 do not reveal the entire causal pathways of what works within TADA, for whom, under what circumstances, how and why. Refer to the appended papers or Chapter 6 for a more complete picture of the programme theories.

Figure 3. Study process, adopted from Pawson & Tilley (1997).

Programme refinement
TADA works by reaching a patient population otherwise found to avoid dental services. As it is free of charge, the service is easy to access and meets individual needs. The service tailors CBT to meet individual needs, and the dental practitioners adopted roles that enabled them to build patients' trust, facilitate a safe space and thereby grade the desensitization regarding patients' fear triggers. Adopting these roles requires dental practitioners to work in an institutional setting that provides sufficient time and additional skills, thus enhancing their interpersonal development and allowing them to adopt an appropriate communication style and therapeutic pace for each patient.
Led to three programme theories describing the relational elements of the TADA service
Led to four programme theories describing the structure of the TADA service
Data analysis
Content analyses with a direct approach (Hsieh & Shannon 2005) and CMO heuristics
Led to four programme theories describing the relational elements of the TADA service
Data analysis phase 2
Template analyses (King, 2012) and CMO heuristics
Programme refinement
TADA works by teams tailoring the service to meet individual patients' needs. TADA dental practitioners are in a supportive environment and placed in proximity to TADA psychologists, which leads to knowledge transfer between professional groups and dental practitioners meeting individual needs by building a repertoire of how to communicate and grade the therapy they deliver to patients who have experience of abuse, torture and/or dental phobia. Also, the TADA service teams are provided with the resource of time to build a trusting relationship with the patients, which deviates from their traditional performance-led culture being treatment oriented. From a patient perspective, these relational aspects were considered as necessary to the success of the programme as the therapeutic intervention itself. Patients added that a calm, holistic approach by the dental practitioner, paired with a positive judgement and predictability, led to them feeling in control and cared for while their self-esteem reemerged.
Hypothesis testing phase 2
Qualitative methods with a patient perspective and abductive approach to uncover how time, communication and pace (context) affected patients' trust, safe space and gradual desensitisation (mechanisms), leading to their alleviated anxiety (outcome)
hypothesis
Multimethods with an abductive approach to develop theory on what works (CBT delivered by dental practitioners alleviated dental anxiety) for whom (abuse, torture survivors and dental phobia patients)
Initial rough theory
CBT delivered by dental practitioners will alleviate the dental anxiety for patients with a history of torture, abuse or dental phobia, allowing them to return (Norwegian Directorate of Health, 2010)
Data collection
12 service developer/deliverer interviews concurrent with collecting 13 service documents
Data collection phase 2
15 patient interviews

4 Trustworthiness

Addressing the study's trustworthiness is essential to gain the reader's trust and establish the research quality. Quantitative research seeks to do so by maximising rigour through consideration of reliability and validity. However, qualitative research establishes rigour by considering trustworthiness and its components. The study collected qualitative data representing perspectives from patients, service developers and deliverers, which lends itself to detailed descriptions of complex processes and settings (Hanson et al., 2011). This section reflects on the trustworthiness components proposed by Lincoln and Guba (1986) and includes rival theories, triangulation and consolidations proposed by the realist community.

4.1 Credibility

Credibility, often described as internal validity, addresses the degree of "truth" presented in the findings—or how representative the data are of the informant's perspective (Polit & Beck, 2004). This study used four techniques to enhance credibility: prolonged engagement in the field, triangulation, consolidations and rival theories.

4.1.1 Prolonged engagement in the field

This study's prolonged engagement in the field persisted over the first year (2019). It involved attending service sites, following the footsteps of practitioners, touring various facilities across the country and attending meetings at the national and regional levels. Engaging in the field culminated in relationships and trust with staff and worked as a platform to discuss emerging rough programme theories. The study gained multiple perspectives and an enhanced understanding of the context within and across service sites and service architecture through engagement in the field.

4.1.2 Triangulation

By triangulating, we combined data sources and perspectives to enhance our understanding of the programme theory. This allowed us to check data consistency while adding richness and variation to the data (Mertens & Hesse-Biber, 2012; Morse, 1991). The first phase of the study (developing the programme theory) triangulated data sources by combining stakeholder interviews and collecting service documents. The last phase of the study (refining the programme theory through patients' perspectives) triangulated data during the analyses by building on the deliverer perspective (Section 3.5.3 elaborated on this).

4.1.3 Consolidations and debriefing with stakeholders or disputing among scholars

Realist evaluations tend to reengage with stakeholders to consolidate programme theories (Manzano, 2016; Pawson & Tilley, 1997; Wong et al., 2016). The current study did not reengage with the stakeholder group because they were scattered across Norway and had busy schedules. Thus, for pragmatic reasons, the author's co-supervisor, who was part of the stakeholder group, member checked the programme theories and provided consolidation. Member checking is a technique to establish credibility. Member checking allows study participants to provide feedback on emergent theories and findings, confirming the accuracy of theory building (Polit & Beck, 2004). Although member checking is often used within realist research and considered a tool for credibility, it is important to note that this technique is also critiqued. The criticism lies in that participants might find it difficult finding their own experience or voiced opinions in the data that has been synthesised and abstracted to cover a broader range of participants (Polit & Beck, 2004).

Beyond member checking, the supervisory session challenged the perspectives and theory development, lending itself to discussions of refinements or justifications for theory development and refinement.

These supervisory consolidations provided an arena to defend and discuss the research process and emergent topics. Lastly, the author attended the Centre for Advancement in Realist Evaluation and Synthesis workshops and summer schools, which provided a setting to expose the analyses and explore the ongoing research and aspects of inquiry (Lincoln & Guba, 1986).

4.1.4 Rival theories

Rival theories are competing theories created by juxtaposing aspects of the context, mechanisms or outcome. Creating rival theories while theorising may diminish subjectivity (Van Belle et al., 2010). Some realist scholars claim that including juxtaposed CMOs in the analyses brings us closer to understanding the reality of which working mechanisms are needed for desired service outcomes (J. Jagosh, personal communication 31 October, 2019). During data collection, participants were asked about juxtaposed scenarios. When developing programme theories seen from the service deliverer perspective, juxtaposed scenarios (the regular dental setting and TADA) provided explanatory power for why what worked within TADA. Thus, Paper 2 ("More Than Just a Dental Practitioner") added the juxtaposed CMO identified from the analyses for a contextual understanding.

4.1.5 Transferability, dependability and specificity

Transferability often relates to external validity, which is the degree to which findings presented in a study are applicable across other populations or groups, and dependability addresses whether the findings are consistent and repeatable (Polit & Beck, 2004). Nevertheless, the realist community debates the transferability and dependability of a realist evaluation on the premise that services will work differently for different people, depending on the context and its complexity. Grappling the entire context is not viable because it is too dense and everchanging. Thus, the historical factor makes it close to impossible to replicate the

findings. Due to these ontological underpinnings, one is cautious in making generalisable statements regarding service outcomes in realist evaluations.

To overcome the replicable aspect, the realist researcher focuses on building the theory, acknowledging that there will be blind spots to the understanding and that services will not work for all involved. Thus, instead of repeating realist evaluations to uncover the consistency in findings and whether measures are repeatable, realist evaluations continue the chase for gaining context-dependent data by collecting data from different sites. This leads to programme specificity and a condensed explanation of service outcomes. The specificity of realist evaluations is key. By providing specificity, the realist evaluation allows the reader to assess the degree of fit or the programme theories' applicability elsewhere. Thus, a realist evaluation can provide programme (service) specificity that permits research transferability (Emmel et al., 2018; Pawson & Tilley, 1997).

4.2 Confirmability

Confirmability asks to what degree the findings represent the informants and not the researcher (Polit & Beck, 2004). Realist research involves attaining a sense of theory sensitivity—an awareness of the programme theory gained through an iterative approach and prolonged engagement in the field. Nevertheless, it is easy to fall into the trap of confirming the programme theory that represents the researcher's subjective opinion and vision of the service programme rather than what the informants describe it as. To overcome subjectivity, the supervisory team confirmed the content and definition of the themes throughout the analyses. The study also used triangulation tools, consolidations and rival theories to diminish this. Another tool used was reflexivity.

4.2.1 Reflexivity and reflective practices

Reflexivity and reflective practices tend to be used interchangeably in research, although authors describe a slight distinguishment between the two (Alvesson, 2018). Reflective practices can clarify potential blind spots, insight about aspects that might been missed, by being careful in interpretations and considering and re-interpreting scenarios and events (Alvesson, 2018). Reflexivity is understood as a systematic examination, a strategy, in which the researcher understands their position and how this impacts the knowledge construction (Primeau, 2003). Thus, a reflexive approach involves identifying attitudes and though processes, knowledge gaps and behavioural approaches. By being reflexive in our research, we acknowledge that our role as a researcher affects our surroundings. Strategies proposed for reflexivity are an internal dialogue and support from team members.

This section uses first person pronouns to emphasize the reflections. Throughout the study, I engaged in reflexive processes by situating myself and considering how my background, thoughts, actions, responses and underlying assumptions could impact the research process (Darawsheh, 2014). One strategy I used was keeping a research diary and journaling my beliefs, values, and expectations, which also positioned myself during data collection. The journalling prompted reflection, allowing me to understand the impact and motives I had as a researcher. This was particularly interesting when data was collected through interviews with patients. I learned that my expectations and assumptions about the patients were minimized when data was collected through phone interviews than in person. Moreover, I embarked on this PhD journey as a novice in dentistry. Thus, journaling was also helpful in tracking my learning progress and identifying knowledge gaps.

Engaging and documenting the reflective process was particularly important for revealing expectations and potential biases stemming from being employed (and funded) by the Oral Health Centre of Expertise

Rogaland. The TADA service is embedded in the Oral Health Centre of Expertise organisation. Thus, I understood the natural inclination towards uncovering the successes or un-successes of the TADA service. To minimise the bias of my employment, I found it very helpful that the supervision team also consisted of an independent party (not associated with the Oral Health Centre), balancing the expectations of the study. Moreover, it was imperative to inform the study participants about my employment and, during the analyses, consider the impact of employment on data interpretation. Supervision meetings were, therefore, fruitful for raising and discussing rival theories. Moreover, the focus on successors and un-successors was discussed multiple times in supervisory meetings. Beyond the supervision meetings, the working programme theories and the potential inclination towards understanding and reporting service success were discussed in other disputatious communities, such as the University of Stavanger and realist workshops, and raised as a challenge with *Meet A Mentor* at a Pan European Region-International Association for Dental Research conference.

The realist research paradigm was also valuable for engaging in reflective processes. For example, the realist research question focuses on what works rather than did TADA work. Moreover, a realist assumption is that not everything will work for everyone. Thus, with that as a premise, it was easier to discuss what was not working –such as the service struggling with reaching out to torture survivors (identified in Paper 1, "Exploring the Context, Mechanisms and Outcomes").

Although I performed the data collection, transcription and analyses, the entire supervision team played a vital role in the phases before and during the data collection and the analyses.

5 Ethical deliberations

As a researcher, one faces ethical challenges at all project stages, from design to reporting. Reflecting on ethical guidelines is crucial, as they help us change our behaviour to protect the individuals involved in our study (Israel & Hay, 2006). The Norwegian Centre for Research Data, Project No: 619754, and the Regional Committees for Medical and Health Research Ethics, Project number: 134932, approved this study.

The study relied on voluntary informed consent. Service developers and deliverers were recruited through e-mail, and the TADA staff recruited patients on their final day of anxiety treatment. All participants were informed in writing and orally about the research aim, the reason for recruiting them and data-handling procedures, and they were informed on how they could withdraw their consent. This chapter considers the study's additional ethical concerns addressing interviews, confidentiality and the implications of the coronavirus.

5.1 Conducting interviews with service developers and deliverers

The study collected data through interviews with service developers and deliverers, which raised ethical considerations regarding their roles. By conducting individual interviews, subject confidentiality was maintained, and participants could freely express their take on the service that other stakeholders could have contested (such as through focus-group interviews). The interviewer held master's-level qualitative interview experience and training that provided a repertoire of how to display humbleness, curiosity and reflexivity as tools to facilitate a safe space during the interview. Facilitating a safe space was considered necessary so that the service developers and deliverers did not feel their work was being evaluated (Polit & Beck, 2017). Participants were also reminded before the study that they could withdraw at any time and

abstain from answering questions. Furthermore, the supervision team discussed the interview schedule topics beforehand and addressed them with the Norwegian Centre for Research Data.

5.2 Conducting interviews with service users

Vulnerable groups are often marginalised in society and are challenging to reach, but they may also provide a study with the most insightful and significant perspective (Liamputtong, 2007). To understand the service's workings from the patient's perspective, the study interviewed torture and abuse survivors and people with dental phobia enrolled in TADA. The study considers TADA patients to be vulnerable due to their adverse and severe health susceptibility (Flaskerud & Winslow, 1998).

Concerning the ethics involved in interviewing TADA patients, study participation could be something that patients would want. Study participation can impact future practice and inform the research community. TADA patients recruited for the study supported that statement, saying that the interview was valuable in allowing them to reflect on the service pathway and details for future practice.

Nevertheless, the study took multiple measures to ensure that their participation did not lead to any setbacks. When researching vulnerable groups, the researcher holds a special responsibility to respect the participants' interests throughout the research cycle and to be cautious regarding the issue of sensitive data (Norwegian Committee for Research Ethics in Social Sciences [NESH], 2016). To diminish any potential harm through research participation, the interviews focused solely on patients' service experience, and they were provided with the topics before the interview. This provided them with a sense of predictability and control over emergent themes.

As with all research, the implicit rule was to take care of the research participants rather than the research itself (NESH, 2016). Based on the

premise that sensitive topics could emerge during the interview, individual interviews were chosen instead of focus-group interviews (Agar & MacDonald, 1995). Furthermore, as emergent themes arose during the interview, the interviewer continually reflected on their background to respond sensitively (Allmark et al., 2009). This also entailed ensuring a safe space by avoiding questions like "Why so?" and instead asking, "If you feel comfortable, can you explain more?", and by reminding patients that they could refrain from answering questions and stop the interview at any point.

Patients were interviewed at the service intersection of having finished anxiety treatment and being en route to restoring their oral health (see Figure 2 in Paper 1, "Exploring the Contexts, Mechanisms and Outcomes"). Conducting interviews with patients at this intersection was an ethical choice based on the premise that these patients would have the TADA service as a safety net. By still being enrolled in TADA, patients had service rights and a service plan, which were believed to be additional ethical and safety factors. Lastly, a contingency plan was outlined in the event of retraumatisation (described in the following section, 5.2.1).

5.2.1 The contingency plan

The following contingency plan was developed to protect patients in their study participation:

> In the event of reactivation of trauma and subsequent increased symptom pressure due to interview/study participation, the patient will have the opportunity to receive further follow-up by one of the psychologist specialists in TADA/Oral Health Centre of Expertise. Any reactivation/increased symptom pressure will be assessed at the end of the interview. The patient will receive contact information from a psychologist and, if desired, be offered a conversation with a psychologist within two working days. In cases of urgency, the patient will receive help from other

> agencies, such as the acute ward or a GP [general practitioner]. The patient will also be referred to a psychiatric outpatient service or privately practicing psychologist for further follow-up.

None of the patients participating in this study took advantage of this offer.

5.3 Confidentiality and anonymity

The study took measures to ensure participant's confidentiality and anonymity by conducting individual interviews instead of focus-group interviews. Moreover, participant data were linked to a code during the analysis to ensure anonymity when working with the raw data. In addition, the study refrained from disclosing the participants' locations to ensure external anonymity in the published findings. The published quotes only revealed demographics that included the time since the last dental visit, gender and the reason for TADA treatment (trauma or dental phobia, Paper 3, "Seeing the Person Before the Teeth"). Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes") and Paper 2 ("More Than Just a Dental Practitioner") only revealed a participant's organisational role when linking them to their quotes and refrained from adding gender and the district of practice. Considering the small stakeholder pool of service developers, maintaining the internal anonymity of the study was challenging. Considering that the patient pool was more extensive, anonymity was maintained.

5.4 Coronavirus 2019–2022

The pandemic was treading into our lives, and on 12 March 2020, it closed Norway off. Little did we know that the news alerting us about the virus in Wuhan, China, in late 2019 would impact and change our outlook on daily routines and our ongoing scientific work. From a scientific stance, the times were no doubt fascinating. Science was happening right in front of us. However, the pandemic cancelled courses,

delayed conferences and suspended academic activities for aspiring researchers on a doctoral route. If a PhD setting was not already a lonesome venture, the ripple effects of the pandemic sure made it so.

The study was in its last phase, which involved collecting data from patients transitioning from anxiety treatment to oral restoration (Figure 2 in Paper 1, "Exploring the Contexts, Mechanisms and Outcomes", and Paper 3, "Seeing the Person Before the Teeth"). The ethical committee was contacted to discuss ethical challenges related to data collection, considering the risk of infection. After deliberation with the ethical committee, the data collection period was extended, and patients could choose whether they preferred to be interviewed over the phone or in person.

5.4.1 Phone or in-person interviews

All but one TADA patient chose to conduct interviews over the phone rather than face to face. For the phone interviews, precalls were made to plan for the upcoming phone interview, ensuring that the patients had set aside time and were in a safe and convenient space.

The phone calls always started with the interviewer explaining the room setting that she was in and ensuring that there was no one else present. Next, patients gave oral consent for putting the call on speaker and using a digital recorder.

Through phone interviews, nonverbal cues indicating the mood of the interviewee, cues for follow-up questions and active listening through body language were lost. Moreover, the impact of silence was understood in a new way. During in-person interviews, silence from the interviewer is usually a helpful tool for reflection and gives the participant the stage. This silence is supported by attentive body language, assuring that the situation is not awkward. However, this

silence could become awkward through the phone because the patient's reactions were not visible.

Nonetheless, it was important for the interviewer to provide this silence and set aside the awkwardness because the silence led the patients to contemplate and reflect on the questions. As the learning progressed throughout the study, the experience was that the silence needed to be enhanced when conducting phone interviews compared to in person since the nonverbal cues to assess the situation were lost.

Notably, the in-person interview during the pandemic also had its barriers: masks and glasses. Thus, the typical interview setting was again challenged—this time, with fogged glasses and difficulties hearing each other due to the masks blocking each other's faces. Also, the physical room of the interview setting was changed, with the room rearranged to have two chairs facing each other at a two-metre distance, with hand sanitiser and additional masks on the table between the chairs.

Although the interview setting had its barriers, the patients considered the interview positive. The patients reflected that setting aside time for conducting the interviews over the phone was more accessible than in person. Also, considering the anxiety aspects and shame related to their teeth (elaborated in the findings in Paper 3, "Seeing the Person Before the Teeth"), one could speculate whether TADA patients were more open during the interview because their mouths were not "revealed" (Locker et al., 2000). Unfortunately, the study did not ask these patients about this.

6 A summary of findings

By applying the realist evaluation strategy, the study aimed to uncover what works within the TADA service, for whom and in what circumstances by developing theory from a developer and deliverer perspective and refining the theory from a patient perspective.

The study outlined three focused questions, each appending to a separate paper, to operationalise the realist question above. Table two on the following page outlines the study

1. From a developer perspective, how is the service designed to achieve its outcomes of alleviating dental anxiety and restoring dentition for its users?
2. From a deliverer perspective, how and under what circumstances are TADA dental practitioners managing the role change of alleviating dental anxiety for TADA patients?
3. From a patient perspective, how is the TADA service alleviating patients' dental anxiety?

The study identifies 10 programme theories answering the focused questions and explaining the structural and relational features essential for the TADA service's workings (table 3). Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes") outlines four programme theories explaining how structural features impact TADA service outcomes. The study also identifies and depicts the architecture of TADA. The service architecture is embedded in the service pathways and depicts the structural features of TADA's workings. Thus, an undercategory describing the service pathways is part of Paper 1 ("Exploring the Context, Mechanisms and Outcomes"). Paper 2 ("More Than Just a Dental Practitioner") and Paper 3 ("Seeing the Person Before the Teeth") outline programme theories showing the relational aspect of TADA.

Table 2. Overview of the appended papers, including extracted titles for each CMO

Overall aim	**What works within TADA, for whom, under what circumstances, how and why**		
	Paper 1	Paper 2	Paper 3
Title	"Exploring the Contexts, Mechanisms and Outcomes of a Torture, Abuse and Dental Anxiety Service in Norway"	"More Than Just a Dental Practitioner"	"Seeing the Person Before the Teeth"
Focused question	From a developer perspective, how is the service designed to achieve its outcomes of alleviating dental anxiety and restoring dentition for its users?	From a deliverer perspective, how and under what circumstances are TADA dental practitioners managing the role change of alleviating dental anxiety for TADA patients?	From a patient perspective, how is the TADA service alleviating patients' dental anxiety?
Perspective	Developing the programme theory as held by developers	Developing the programme theory as held by deliverers	Refining the theory with patients' perspectives
Research phase	Phase 1		Phase 2
Data	12 stakeholder interviews and 13 service documents		15 patients
Analyses	Content analyses and CMO heuristics		Template analyses and CMO heuristics

Table 3. Extracted titles for each CMO

Four programme theories depicting structural elements of TADA and service structure pathway	**Three programme theories depicting the relational features of TADA**	
Paper 1	Paper 2	Paper 3
Subsidising the TADA service means oral health becomes a public project and dental avoidance behaviours become a public health concern. This consequently, improves patient access and service uptake.	Time leads to trust.	A holistic and calm approach taken by the dentist led patients to feel understood and cared for.
Catering to a heterogeneous patient group means adapting and tailoring the service to regional resources and patient requirements.	Matching communication styles.	Feeling that the dentist viewed them positively in the dental setting reduced patients' feelings of shame and helped them regain their self-esteem.
A national service operated by individual satellites leads to a lack of communication, nationally and regionally, and isolation of each service from others.	A graded pace facilitates gradual and successful exposure.	The predictability of the TADA sessions led patients to feel a sense of control in this feared situation.
A lack of recruitment of torture survivors to the TADA service is explained by challenges that patients experience because of the migration process and poor dissemination practices.		

6.1 Paper 1, "Exploring the Contexts, Mechanisms and Outcomes of a Torture, Abuse and Dental Anxiety Service in Norway"

Bryne, E., Hean, S., Evensen, K. B., & Bull, V. H. (2022). Exploring the contexts, mechanisms and outcomes of a torture, abuse and dental anxiety service in Norway: A realist evaluation. *BMC Health Services Research, 22*(1), 533. doi:/10.1186/s12913-022-07913-7

This first paper aimed to understand how TADA is designed to achieve its outcomes of alleviating patients' dental anxiety and restoring their oral health. Four programme theories depicting the structural workings were identified from 12 stakeholder interviews and 13 service documents. The study develops programme theories depicting workings at the macro and meso levels by applying a content analysis, including CMO heuristics, to the data. The first programme theory explains that key to the context is that TADA is subsidised, which generated a shift in how oral health and avoidance behaviour is addressed -going from being a private project to being a public responsibility for vulnerable groups, and increased service accessibility. The shift in focus and increased accessibility resulted in increased service uptake. Second, specific to the context of TADA, is that the national guidelines are open to interpretation, and the TADA patients are heterogeneous. This triggers the service teams to tailor the treatment, adapting regional resources to bespoke patient needs. Tailoring the service leads to individual treatment and national service differences. The third programme theory explains how the service lacks national leadership and joint national meeting areas, leading teams to become self-reliant and protectionist in their work. Thus, an outcome was that teams operate as individual satellites that had team cohesion but were in isolation from other teams nationally and regionally. Lastly, a negative service outcome identified was the TADA service lack of torture survivors. Service documents and stakeholders ascribed possible mechanisms to this being that torture survivors were *overwhelmed* by migration processes, *lacked priority* to

their oral health or they were *unaware* of the service because the context currently reflects poor dissemination practices towards this group and migration processes is an emotional endeavour.

6.1.1 Service pathways

An architectural understanding is emphasised as a tool for untangling service design complexity (Jagosh, 2019). This tool allows blind spots to become more evident while enhancing theory sensitivity. By applying an architectural understanding of the TADA service, service pathways affecting service outcomes arose (Figure 2, Paper 1, "Exploring the Contexts, Mechanisms and Outcomes"). The service architecture showed that the most common pathway was for patients to start exposure therapy provided by the dental practitioner directly after the first psychological assessment, assessing for service admission. As described in Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes"), the service commits to offering the patient 12 exposure therapy sessions, a typical number of sessions required for anxiety treatment (Kaczkurkin & Foa, 2015). However, as years of avoidance behaviour tend to be an underlying precursor to anxiety (Abrahamsson et al., 2001; Wide & Hakeberg, 2018), some patients were in severe pain and needed acute assistance. In such cases, the TADA dental practitioner assisted in determining the severity and level of acuteness. For acute dental treatment cases, local anaesthesia was offered. The acute treatment did not restore patients' oral health to meet service requirements for *acceptable* oral health (Section 2.3), as this would presumably affect the patients' motivation to treat their anxiety.

Although service documents and the literature (Kaczkurkin & Foa, 2015) point to 12 therapeutic sessions as sufficient for treating the anxiety aspect, as outlined in Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes"), service deliverers explained that exposure therapy in the TADA service exceeds this number. The 12 hours were exceeded depending on the patient's background, particularly if the patient

suffered from comorbidity. Concerning comorbidity, patients were likely receiving additional psychological treatment, typically for catastrophic thoughts, PTSD, obsessive-compulsive disorders or other anxiety-related disorders. In such cases, the TADA service could be paralleled with ongoing interventions or paused. Pausing treatment means keeping the service pathway spot and returning once ready. If patients were not receiving additional treatment for their comorbidity but were in need, the TADA psychologist could assist or refer the patients.

6.2 Paper 2, "More Than Just a Dental Practitioner"

Bryne, E., Hean, S., Evensen, K., & Bull, V. (2021). More than just a dental practitioner. *European Journal of Oral Sciences, 129*(6). doi:10.1111/eos.12820

The second appended paper aimed to develop theory describing how and under what circumstances TADA dental practitioners manage their role change regarding alleviating dental anxiety for TADA patients.

TADA stakeholders interviewed in phase one of the study held dual roles as developers and deliverers. Thus, data collected from phase one informed the study from both the deliverer and developer perspectives and was used as a database for this paper's aim. Content analysis with a CMO heuristic, using a dyadic take on mechanisms (Section 3.4.3), was applied to the data material. Three programme theories were developed from the data material, illustrating dental practitioners' new role in delivering CBT as part of the TADA service. In addition, the data material showed how the TADA setting was juxtaposed against the regular dental setting, emphasising service resources and critical contextual factors. Therefore, this paper added the juxtaposed scenario for explanatory power.

The first programme theory describes how dental practitioners needed to be in an institutional setting that would give them enough time to engage

with the patients and triggering patients' trust. Second, the dental practitioner described key to the context was being in an institutional setting and having an interpersonal relationship with the psychologist so that communication skills were enhanced, allowing them to adapt and match their communication to meet the patients' level of understanding. This was believed to facilitate and triggering the feeling of a safe space, for the patient. Third, a key part of the context was for dental practitioner to be in an institutional setting that reflected a good learning ethos and welcoming relationship between them and the psychologist so that they could learn how to grade the exposure therapy as to what was tolerable for the patients. It was theorised that the mechanisms of trust, a safe space and graded exposure were necessary for the patients to commence and follow through on their service pathway.

6.3 Paper 3, "Seeing the Person Before the Teeth"

Bryne, E., Hean, S., Evensen, K., & Bull, V. (2022). Seeing the person before the teeth: A realist evaluation of a dental anxiety service in Norway. *European Journal of Oral Sciences, 130*(3). doi:10.1111/eos.12860

Paper 3 aimed to uncover how the TADA service alleviated patients' dental anxiety and inform of TADA's functioning, specifically its working mechanisms. The programme theory built from phase one of the study was used as an initial programme theory to test and refine with the patient's perspective. See Figure 3 (phase two and refined theory block) or Paper 3 ("Seeing the Person Before the Teeth") for details.

Phase two of the study recruited 15 patients from one county in Norway. Data collected through semi-structured interviews were analysed through template analysis and CMO heuristics, leading to three programme theories depicting the relational features of TADA's functioning. The findings indicated that, in the TADA setting, where dental practitioners deliver the exposure element of CBT, patients

described key to the context was how dental practitioners offered them a calm and holistic approach that was characterised by positive judgement and predictable service delivery. Patients elaborated that, when dental practitioners provided this, in the therapeutic context, it triggered the mechanisms of control, they felt cared for, their shame was reduced and their self-esteem emerged. Patients regarded regaining their control, feeling cared for and reducing their shame while enhancing their esteem as essential for the exposure to commence, and linked this to their outcome of alleviating dental anxiety. It ultimately prepared them for the dental restoration phase on which they were embarking (see Figure 2 in Paper 1, "Exploring the Contexts, Mechanisms, and Outcomes", for service pathway clarification).

Paper 3 discusses that patients' emphasis on *how* CBT was delivered rather than on the specific therapy components indicates that dental practitioners take a person-centred care approach. This approach taken by dental practitioners seems vital for patients to reach their service outcomes and is elaborated on in the discussion chapter (Chapter 7).

7 Discussion

The overall aim of the study was to uncover what works within TADA, for whom, under what circumstances, how and why. The study adopted a realist evaluation strategy to answer this aim and collected data reflecting the service from developer, deliverer and user (patient) perspectives. Different analyses that included CMO heuristics led to 10 programme theories answering the different focused questions. Four programme theories pertain to the developers' perspective, explaining how the structural features of TADA contribute to alleviating the targeted patient groups' dental anxiety and oral restoration (Paper 1, "Exploring the Contexts, Mechanisms and Outcomes"). Three programme theories relate to the deliverer's perspective, detailing how and under what circumstances the dental practitioners manage a role change to alleviate dental anxiety (Paper 2, "More Than Just a Dental Practitioner"). Three programme theories refer to the patients' perspectives, outlining the relational features necessary for the service to alleviate their dental anxiety (Paper 3, "Seeing the Person Before the Teeth"). Figure 4 depicts the CMOs, which work as building blocks for the 10 programme theories.

This chapter starts by discussing the structural and relational features of TADA before raising the language challenges, the study strengths and limitations and how realist evaluations position themselves as research.

Figure 4.

This figure depicts the ten CMOs for the study. Colour coding is used to depict what falls under context, mechanisms, or outcomes. Moreover, all mechanisms are placed in an arrow, following previous realist scholars of depicting mechanisms (Dalkin et al, 2015; Pawson & Tilley, 1997). The mechanisms are contingent on their context which is placed right above, and lead to an outcome which is placed right below the arrows. The numbers following the text refers to the individual CMO, which

serve as building blocks for the programme theory in the thesis. The figure distinguishes between the relational and structural elements of TADA by placing them in different blue boxes. DP is shortened for dental practitioner.

structural
(1) A state subsidy
(2) Guidelines open to interpretation
(3) A lack of explicit leadership and poor communication across teams
(4) A complex and poor dissemination processes for torture survivors
context
(1) Altered *focus* and increased *accessibility*
(2) Led teams to *tailor* the service to meet individual needs
(3) Led teams to feel *self-reliant* and *protectionist* of their work
(4) Led torture survivors feeling overwhelmed, unaware or not prioritising their oral health
mechanisms
(1) Leading to an increased service uptake
(2) Resulting in a two folded outcome: a service with multiple and individual treatment outcomes, and a service diverges
(3) Resulting in a two folded outcome: teams working cohesively, however, a negative outcome is they work in isolation
(4) Resulting in an underrepresentation of torture survivors
outcomes
relational
(5) DPs with sufficient time
(6) Nurtures a safe space
(7) DPs setting the pace right
context
(5) Builds a *trusting* relationship
(6) DPs *matching* their communication
(7) Ensures patients *gradual* desensitisation
mechanisms
Dental anxiety is alleviated
outcome
emotional
(8) Patients are given a calm and holistic approach
(9) Patients are given a positive judgement
(10) Patients are given predictability
context
(8) Feel *cared for*
(9) Regains their *self-esteem* and *shame* reduces
(10) Feel in *control*
mechanisms
Dental anxiety is alleviated
outcome

7.1 Structure

The findings from the study show that the TADA service's structural features impact how it works, for whom and under what circumstances. Structural features pertain to TADA's financial structure, treatment jurisdiction and hybrid bottom-up/top-down approach.

7.1.1 Financial structure and treatment jurisdiction

The first programme theory (Paper 1, "Exploring the Contexts, Mechanisms and Outcomes") depicts how a context of TADA is its full subsidy by the Norwegian state, which has removed financial barriers for patients, leading to service accessibility. A full service subsidy is uncommon in the Norwegian context because, although the welfare system provides security for its population through universal health care, free education and social safety nets for vulnerable groups, oral health is usually a private venture (Clarsen et al., 2022).

Nonetheless, since 2010, the Norwegian welfare state has earmarked a budget for the TADA service. Subsidising TADA as a welfare benefit for its targeted patient group also provides general dental practitioners with a service to which they can refer trauma patients. By having a service for referral, dental practitioners can also adhere to their dental care act, which urges them to care for abuse survivors (Tannhelsetjenesteloven, 1983).

Subsidising oral health is part of an ongoing debate in Norway. For the current study, service developers believed that subsidising TADA is crucial for TADA patients because the cost associated with restoring their oral health could otherwise be unaffordable for the patient. The cost can be as much as 20,000 euros (p9, Paper 1, "Exploring the Contexts, Mechanisms and Outcomes"). Also, research indicates that there may be

a lack of willingness to pay for such services (Halvorsen & Willumsen, 2004).

The current financial structure of TADA covers anxiety and oral treatment, and the first programme theory explains that this increases service accessibility (Paper 1, "Exploring the Contexts, Mechanisms and Outcome"). Accessibility is two-fold; not only does the service need to be present, but targeted populations also need to utilise it (Gulliford et al., 2002). Service utilisation is depicted in the TADA service documents, which reveal that, as of 2018, 1,186 patients finalised or were enrolled in the service and the waitlist is a year or more long.

In uncovering the service architecture in the first data collection phase, the study learned that TADA had 52 teams (as of 2018) spread across Norway to cater to TADA patients and waitlists extending a year. There is no available data reporting on staff amount in TADA, nationally.

The current structure of general dental services in Norway places the TADA service as the only service for referral for trauma patients and patients with dental phobia who need dental treatment and dental anxiety alleviated. This also means that patients with dental anxiety who do not meet the diagnostic criteria of phobia (APA, 2013) or do not have a history of torture or abuse do not receive help from Norwegian dental services. Thus, TADA becomes a specialised and exclusive service for its patient group. However, there are likely population groups with less severe dental anxiety who could benefit from anxiety treatment. For example, a Norwegian study by Hauge et al. (2021) found that CBT, delivered singlehandedly by a general dental practitioner (not part of a team with psychologist), or prescribing patients with sedatives, combined with a behavioural approach, both effectively reduced patients (who self-reported) dental anxiety.

Beyond the issue of waiting more than a year for the service, placing this treatment only under TADA jurisdiction can also be problematic in the sense of service experience. If a patient's service experience is negative,

they may be less willing to seek future help (Abramowitz et al., 2019). With the current structure, patients will have nowhere else to go, as they lack safe "exit options", which could also affect the service deliverers' perception of competition and treatment choice (LeGrand, 2010). In light of Hauge et al.'s (2021) findings, adopting the services' financial structure to also cover patients with dental anxiety (not meeting the diagnostical criteria of phobia) or expanding the jurisdiction could impact the long waitlists that the service is currently experiencing and could help more patients.

Nonetheless, the current structure reflects that TADA alone needs to cater to patients who are torture or abuse survivors or patients with dental phobia. It is difficult to establish the prevalence of patients needing this service and whether 52 TADA teams are sufficient, or how many treatment teams are needed. However, we can argue that a large portion of the 5.4 million Norwegian population (Worldometers.info, 2022) would benefit from such a service, based on the recent research showing that one in four are abuse survivors, 8% of 18-year-olds struggle with severe dental anxiety, and 35,000 torture survivors reside in Norway (Augusti, E.M., & Skauge, A. D., 2023; Nermo et al., 2019; Norwegian Red Cross, 2020). An independent evaluation addressing the socioeconomic status of TADA patients and service cost would be timely and warranted.

7.1.2 A hybrid bottom-up and top-down approach

The second programme theory outlined in Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes") explains how patient heterogeneity and flexible national guidelines have led teams to practice discretion and tailor the service to attend to patient needs. Such a service structure reflects a hybrid top-down and bottom-up approach (Akers et al., 2019; McDermott et al., 2013, 2015). Adopting a hybrid top-down and bottom-up approach also means that the programme balances standardisation and individualisation, which is a challenge for many

health institutions (Mannion & Davies, 2018; Mannion & Exworthy, 2017). Balancing standardisation and individualisation can become difficult within complex health institutions because they contradict each other (Minvielle et al., 2014). Standardising refers to unifying treatment procedures and providing fair and equal service, often steered by top-down visions. In contrast, individualisation refers to tailoring the service and treatment according to the individual's specific and unique needs, steered by a bottom-up approach (Mannion & Exworthy, 2017).

The TADA developers viewed the balance between standardisation and individualisation as necessary for them to execute their professional discretion without being overly restrained by national guidelines. Arguably, if TADA guidelines that steered the TADA service towards a single unified treatment pathway were more prescriptive, service deliverers could feel restrained in their work, which could affect their ability to accommodate the heterogenic and complex patient needs.

Nonetheless, the current service structure has also led TADA teams to diverge in service delivery, which could be considered an unintended outcome. This divergence in service delivery is depicted in the third programme theory in Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes") and attributed it to the county compartmentalisation context, a lack of joint meeting arenas and absent national leadership. Thus, an unintended outcome is that teams were working as individual satellites, each with its perceived unique and intricate challenges, following the bottom-up approach. This team isolation may be disadvantageous for sharing solutions and culminating a common culture, performance and practice (Mannion & Davies, 2018; Mannion & Exworthy, 2017). However, the data also revealed that team isolation led to TADA team cohesion (Paper 1, "Exploring the Contexts, Mechanisms and Outcomes"). Thus, the current service structure works as both a stick and a carrot.

7.2 Relational features

A service's success often hinges on the people involved (Lipsky, 2010). In the current study, relational features were found to impact how TADA works. While the TADA service has embedded the CBT component of exposure therapy to alleviate dental anxiety for their patient group, patients emphasised relational features of the dental practitioners as vital for meeting the service outcome (alleviated dental anxiety). Thus, it was not exclusively the exposure component that they related to their alleviated dental anxiety but also the dental practitioners' approach (Paper 3, "Seeing the Person Before the Teeth").

7.2.1 The dental practitioners' approach

The findings from the study describe how patients valued that the TADA dental practitioners provided them with positive remarks, were calm and holistic and offered gradual desensitisation. Such an approach made patients feel understood and cared for and helped them regain their self-esteem and control. The dental practitioners' approach relates to what authors Scambler et al. (2016) describe as a person-centred care approach. The person-centred care approach is defined as a respectful and responsive approach to patients' preferences and needs that ensures patients' values and voices are listened to throughout all clinical decision-making (Wolfe, 2001). Thus, Paper 3 ("Seeing the Person Before the Teeth") suggests that the exposure element of CBT, combined with a person-centred care approach, led to patients' alleviated dental anxiety.

A person-centred care model has been developed for dental practitioners to adopt in their practice (Scambler & Asimakopoulou, 2014). In line with our findings, the model proposed for dental practice by Scambler and Asimakopoulou (2014) also emphasises the need to take a holistic look at the patient and cultivate a positive relationship between the service deliverer and the patient, where trust is a central pillar. In

addition, a person-centred care approach moves from objectifying the patient and defining them by their disease to a two-fold process in which patients with psychological needs are holistically addressed. Thus, this model incorporates behavioural and relational features into dental care.

The current literature argues that a benevolent and trustworthy clinician is considered more effective and that a felt alliance between practitioner and patient can positively mediate service outcomes (Abramowitz et al., 2019; Baier et al., 2020). The findings from the current study build on our understanding of care and provide details of how it works in the dental setting.

In light of the study findings addressing the dental practitioner approach, from a service perspective, it is not sufficient to learn how to expose patients. Instead, the findings from the current study emphasise that the dental practitioners' approach and communication skills with patients should provide a calm and holistic approach, positive remarks and predictability throughout the sessions. The importance of the dental practitioners' approach and how they lean towards a person-centred care approach also depicts how behavioural and social sciences are nested in dentistry (McNeil et al., 2022). However, the dental practitioners in TADA could be more inclined towards a person-centred approach because dental practitioners working for TADA have expressed a desire to help a vulnerable patient group. Thus, the service could be experiencing a selection bias and may not represent the general dental practitioner.

7.2.2 Incorporating time as a resource

The current study builds on a framework of strategies for treating patients with a history of abuse proposed by Kranstad et al. (2019). This framework emphasises the need for awareness, trust, safety and exploring patients' triggers in the dental setting. Kranstad et al. (2019) theorise how dental practitioners can meet abuse survivors in their daily

practice but not how dental practitioners can adopt a therapeutic role in alleviating their associated dental anxiety. The latter is where the contribution of this thesis lies. This thesis's Paper 2 ("More Than Just a Dental Practitioner") illustrates how time affects service deliverers' ability to build patient trust. The analyses revealed that, in an institutional context where dental practitioners received sufficient time, they could actively listen and display patience and flexibility, fostering a trusting relationship between the dental practitioner and patient. The patients underscored this and added that they saw the dental practitioners as calm and holistic when given sufficient time (Paper 3, "Seeing the Person Before the Teeth"). Kranstad et al. (2019) argue that giving dental practitioners insufficient time to learn how trauma patients react to the dental setting or to build a relationship is the equivalent of malpractice, similar to rushing a root canal treatment.

Although the findings from the current and previous studies emphasise the importance of time, it is essential to consider the context of dentistry. Dentistry focuses on treating specific oral pathologies. Specific and measurable treatment procedures have likely impacted the dental culture in leaning towards being performance-driven in treating a targeted number within a specific time frame (Cohen et al., 2017). Thus, criticism of the dental culture is that this culture could lead to being treatment-oriented (Kent & Blinkhorn, 2013). Incorporating time as a resource to build patient–practitioner relationships, learn about past traumas and facilitate patients' emotional and psychological needs is unspecific and difficult to measure.

Therefore, the existing dental culture could conflict with incorporating time as a resource to build the patient–practitioner relationship and facilitate patients' psychological needs. The current study highlights the context of regular dental practitioners in Paper 2 ("More Than Just a Dental Practitioner") by juxtaposing that scenario with the TADA setting.

7.3 A language challenge

The goal of a language is to be understood. However, not all terms in a language are equally understood. This section raises the issue of a language discrepancy in the words torture, abuse or trauma, and exposure therapy/cognitive behavioural therapy.

Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes") explains how torture survivors are currently marginalised in TADA. National documents revealed that torture survivors represented 21 of the 1,186 enrolled TADA patients. Twenty-one torture survivors are considered underrepresented, based on the reporting of 10,000–35,000 survivors residing in Norway (Norwegian Red Cross, 2020). However, throughout the study, the learning progressed in TADA terminology. While interviewing patients and speaking with service deliverers in the field, it became evident that the terms torture and abuse were difficult to distinguish from one another. While the service documents contrast the two (see Section 2.1 on service inclusion), the patients recruited for the study hesitated to make this distinction. Instead, they explained that their abuse incident felt like torture and referred to their history as trauma. Service deliverers from field excursions echoed this. Research also shows that sexual abuse is not an unusual torture method (Herath & Pollanen, 2017; Høyvik et al., 2018; Pollanen, 2018). To overcome TADA's language mismatch and depict the theory development, the study uses the umbrella term "trauma" to cover both abuse (physical or sexual) and torture in Paper 2 ("More Than Just a Dental Practitioner") and Paper 3 ("Seeing the Person Before the Teeth").

However, this language mismatch also implies a discrepancy in what trauma, torture and abuse means from the developer, deliverer and patient perspectives. This discrepancy may not directly challenge TADA deliverers because they can still perform their job by admitting patients and delivering therapy for patients meeting either the criterion of abuse or torture. However, it could present itself as a problem from the patient

perspective because labelling themselves as torture or abuse survivors could affect their self-perception and raise ambiguity around patient categorisation. From their perspective, it could arguably lend itself to doubts regarding service inclusion criteria.

The initial programme theory of this thesis assumed CBT delivered by dental practitioners would alleviate TADA patients' dental anxiety. However, the programme theories focus mainly on the exposure component of CBT. Altering the focus to exposure therapy reflects the theory development from stakeholder interviews. Although government documents and national guidelines outline CBT as the therapy of choice for treating dental anxiety, the study learnt that service developers and deliverers used CBT as synonymous with exposure therapy. Stakeholders elaborated on specific elements of the exposure therapy they believed were necessary to reach the service outcome of alleviated dental anxiety, leading the study's theory-driven process to rely on and focus on this for TADA programme theory development. Therefore, following the theory put forward by service developers and deliverers, the study chose to focus on the exposure element of TADA, although this is only a component of CBT. Thus, not all components and principles of CBT were explored.

Nonetheless, the study’s intention was not to evaluate the CBT nor question stakeholders take on the therapeutic intervention, thus this is raised as a language challenge. This language challenge may complicate the service delivery, as it may reflect that there are various ways understandings of the intervention, which, consequently, could result in varying ways of delivering the TADA treatment.

7.4 Strength and limitations

As with any study, there are strengths and limitations. Strengths and limitations unique to the appended papers have been raised. This section presents the limitations and strengths across all papers.

The theories presented in a realist evaluation are, in essence, snapshots of what the stakeholders provide as evidence at the given time. Contexts are forever changing, implying that the workings of programmes are forever evolving. Hence, knowing when to finish the data collection becomes challenging. This also raises issues with saturation principles, which qualitative research leans on. Realist scholars dispute whether saturation can be reached. Specifically, Emmel (2015) explains that assuming theory saturation is at odds with the realist methodology because the context constantly changes and is nested in systems affected by human volition. Thus, there will always be more data on the subject to collect because the subject is dynamic and enduring (Emmel, 2015). Knowing when to finish data collection can, therefore, be an overwhelming endeavour for the novice realist researcher. Realists overcome this by incorporating the pragmatic principle that data collection must stop when stakeholders have sufficiently explained their take on the theory of the service because eternal data collection would not be feasible. The study adopted this pragmatic stance and leaned on the saturation principles described by Saunders et al. (2018) during the analyses. Understanding data saturation during analyses involved asking, "Is new data helping the theory building or becoming redundant?" or "Are new themes emerging or being repeated in the analyses?".

One study limitation is that the current study did use the full potential of the teacher–learner cycle such by explicating the programme theories and re-engaging with stakeholders (Manzano, 2016). Section 3.5.2 on interviews describes that the interview method consisted of individual interviews using a semi-structured interview schedule formed by the initial, developing and dyadic take on the programme theory through

open-ended questions. This structure for the interview schedule provided latitude for exploring and uncovering stakeholders' perspectives on contexts, mechanisms and outcomes. Thus, throughout the interview, the interviewer sought the stakeholders' specific takes on the service while pursuing granular details depicting the TADA service's work. The appended papers refer to the interviews as realist-informed. The interview approach of the study was deemed beneficial because people tend to think in realist terms, explaining why outcomes are observed. Thus, by posing the questions in realist terms, the interview setting still informed the theory development.

Moreover, the semi-structured format of the interviews, which was built around the programme theory, was believed to be beneficial in that it provided the interview setting with a latitude to explore emerging topics, which led to depth within the individual interview. It fed the theory with unexpected findings, such as patients' emphasising the dental practitioner's approach.

The patients recruited for this study only represented *one* TADA service county. This is arguably both a strength and a limitation. The limitation is that the data could not describe the regional differences noted in the first data collection phase. As a result, aspects of the research aim remain missing. However, the strength is that by focusing the data collection to only one service region, this allowed the study to gain rich descriptions of mechanisms leading to their outcome of alleviated dental anxiety, focusing on the granular details unique to the individual experience.

The study's description of alleviated dental anxiety has not been supported by a clinical assessment tool on dental anxiety. A clinical dental anxiety tool often used is the modified DAS (MDAS), which indicates the severity of dental anxiety and whether the person needs particular attention (Schuurs & Hoogstraten, 1993). An MDAS score measured quantitatively could have provided the study with measures of patients' dental anxiety, for example, the pre- and post-TADA service

pathways indicating *how much* anxiety was alleviated. Therefore, a notable limitation of the study is that the findings are not supported with quantitative data measuring dental anxiety. To overcome this limitation, the study has provided rich and causal details of how dental anxiety was alleviated from developer, deliverer and patient perspectives.

Another limitation of the current study is that it did not address personal barriers to service utilisation. The study addresses service utilisation only from a developer perspective. However, it is essential to note that personal barriers can also affect service utilisation, such as the person's perception of service needs, attitudes and previous service experience. In addition, patients' service experience was only drawn from the service population attending the TADA service. Therefore, explaining service experience is likely to be positively biased and tells us little about what is *not* working within TADA. Thus, it is important for the reader to acknowledge the limitation of not collecting data from the patients whom the service is not reaching and for whom the service is not working.

During the interviews with patients, COVID, as a theme, was not raised by the interviewer. Nevertheless, a few patients raised this issue as a topic for discussion during the interviews. The patients explained that COVID hampered their service pathway, as some had delayed appointments and felt that their treatment flow was affected. Therefore, one limitation is that the study did not include the pandemic's effect in the programme theories. Including the effects of COVID as part of understanding what works within TADA, for whom, under what circumstances, how and why was believed to lead to a new study of the TADA service. Hence, pragmatic reasons underlie the choice to exclude this from the analyses.

A study strength is that it informs how a service works for whom, under what circumstances, how and why through three perspectives: the developers, deliverers and users. By adopting qualitative methods into the realist evaluation methodology, the study provides programme

specificity and untangles the components of resources needed in the context for patients to alleviate their anxiety.

Lastly, realist evaluations remain few in the dental field and in Norwegian research. Thus, a strength of this study is its methodological contribution to bringing the realist lens to dentistry and the Norwegian context.

7.5 Does a realist evaluation constitute research?

There is ongoing debate about whether evaluations are considered research. A central argument stems from Stufflebeam (1983), who claims that programme evaluations are purposeful for programme improvement but not for proving. According to the Realist and Meta-Narrative Evidence Syntheses: Evolving Standards guidelines (Wong et al., 2016), realist evaluations are considered research in the academic literature but addressed as evaluations in the grey literature. Realist evaluations are concerned with answering what works within a programme and for whom under what circumstances. Thus, a realist's ability to generalise findings into larger, more formal theories is seldom the end goal. This is because the epistemic story in realist evaluations builds around service outcomes, and ontological depth pertains to service specificity. Instead, realist programme theories permit realist researchers to inform programme developers, policymakers, programme deliverers (such as TADA dental practitioners) and service users (such as TADA patients). Hence, evaluations target the programme population. A scientific inquiry tends to target an audience of scientific peers to inform on theory or (dis)prove a hypothesis.

Nevertheless, evaluation studies have adopted scientific methods, and services are becoming evidence-based. Through realist theory-driven methodology, scientific knowledge has progressed. Thus, one can argue that realist evaluations can inform an audience beyond the programme population. The realist community echoes this statement, claiming that

realist evaluations have a scientific contribution because they are interpreted and structured in such a way that they have the ability to merge the epistemic story with the ontological depth (Emmel et al., 2018).

As the introduction of this thesis describes, poor oral health is a global challenge resulting from years of avoidance behaviour. Torture and abuse survivors and patients with dental phobia tend to avoid dental services, which is an international burden. The TADA service seems unique in targeting this patient population and combining dentistry with psychology to alleviate anxiety and restore these patients' oral health. Expanding the findings from investigating such service delivery could be of interest beyond the programme population to the larger scientific community looking at dental service delivery for vulnerable groups and professionals adapting psychological intervention. While realist evaluations reveal programme-specific features of how a programme/service works for particular populations in certain circumstances, their thick descriptions of the context and specificity bring a degree of transferability.

8 Implications

Studying what works within TADA, for whom, under what circumstances, how and why has led to implications for the practice field and society. The appended papers outline implications for the specific programme theories pertaining to each article's aim. This section builds on these. In this chapter, practical implications are raised first, followed by the social implications.

8.1 Practical implication: Context matters

Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes") outlines the structure of TADA and depicts a service pathway for how dental practitioners deliver CBT for their patients. CBT, and the component of exposure therapy, is an art and requires careful skill (Abramowitz et al., 2019), which the current study points to in Paper 2 ("More Than Just a Dental Practitioner"). The programme theories in Paper 2 describe that the dental practitioners need to adopt interpersonal skills that allow them to build a repertoire of how to display sensitivity, match their communication with the patient and grade the therapy on how well it addresses individual anxiety levels. To do this, they need to be in an institutional context that facilitates collaboration and knowledge transfer between dental practitioners and psychologists and places them in proximity. Moreover, the institutional context needs to reflect a learning environment and ethos that accommodates interpersonal relationships between psychologists and dental practitioners and a context that incorporates time as a resource to build patient–practitioner trust. Thus, this implies that the context matters.

Specific contextual elements needed to be present for the exposure component of CBT to commence and for dental practitioners to attend patients' psychological needs. Key elements to a context that facilitates this deviates from the regular dental setting. For example, time is often

used as a tool for measuring patient flow rather than as a tool to build a patient–practitioner relationship. Paper 2 ("More Than Just a Dental Practitioner") includes the juxtaposed context from the analysis (Tables 3–5) to outline how the TADA context deviates from the regular dental context.

This means that, for dental practitioners to successfully adopt a role change to focus on patients' psychological needs, they need to be in a conducive context. It is therefore recommended that dental practitioners and psychologists be placed in proximity to facilitate collaboration and knowledge transfer and accommodate interpersonal relationships between the professions. It is also recommended that the context incorporate time as a resource rather than a tool for measurement so that dental practitioners are not rushed and can build patient–practitioner trust.

8.1.1 Trust in a Nordic context

The above section (8.1) recommends that the context incorporate time as a resource for the dentist–patient relationship to build trust. However, this trust could be context-dependent for Nordic countries. The World Happiness Report shows that Nordic countries score higher on institutional trust (Martela et al., 2020). Therefore, one could speculate that the trust that TADA dental practitioners describe as necessary is attributed to people's inclination towards society and institutions (Paper 2, "More Than Just a Dental Practitioner"). Rothstein and Uslaner (2005) claim that countries with low social and institutional trust, corruption and inequalities have a more challenging time building trust within institutions and societies. Dental practitioners in these contexts may struggle to generate the trust needed to deliver the anxiety treatment and continue the dental restoration. These contextual differences are important for the international community to note.

8.2 Practical implication: One size does not fit all

Individuals display different reactions and fear patterns because anxiety ranges within a spectrum. Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes") describes how the service accommodates individuality in the second programme theory, which explains that TADA teams tailor the service to address individual needs. The deliverer perspective also adds to this by explaining that the pace must match patients' tolerance levels, allowing a gradual exposure to commence (see programme theory 3 in Paper 2, "More Than Just a Dental Practitioner"). Lastly, patients added that they needed predictability in the session and that this varied according to patient preferences (see programme theory 3 in Paper 3, "Seeing the Person Before the Teeth").

For practice, these findings imply that the therapy cannot be identical for all patients. Therefore, the presumption that "one size fits all" can be a pitfall. Thus, while the service outlines an optimal route (see Section 6.1.1 on service pathway findings and Figure 2 in Paper 1, "Exploring the Contexts, Mechanisms and Outcomes"), dental practitioners cannot expect all patients to follow this route. Instead, the programme theories developed by the current study reveal that dental practitioners must learn how to tailor the service pathway, what patient's specific fear triggers are and how they can provide predictability to the sessions. Thus, for practice, this means that the service needs to take an idiosyncratic approach. To do so, it is recommended that the service structure continue to be a hybrid between a top-down and a bottom-up approach, meaning that service guidelines are open to interpretation, allowing service deliverers to judge their fits and address patient needs.

8.3 Practical and societal implication: A shift of focus could diminish the gap

The first programme theory outlined in Paper 1 ("Exploring the Contexts, Mechanism and Outcomes") describes how subsidising the TADA service has led to a shift in focus from addressing oral health and anxiety for vulnerable groups as a private affair to a public health concern. This has led to service uptake. The participants of the current study unanimously regarded TADA as positive. As one stakeholder said, "A lot of people get help. It's been on the agenda; everyone knows about it. This is not a thing the dentists can push away anymore" (p.9, Paper 1, "Exploring the Contexts, Mechanisms and Outcomes").

The shift from addressing vulnerable patients' oral health and dental anxiety as a private affair to a public concern could bring about a new set of values. Beyond the TADA setting, and for general dental practice, it could cultivate a collective belief in how the general dental field needs to address and care for vulnerable patients and their dental anxiety (Kent & Blinkhorn, 2013).

As the programme theory describes (programme theory 1 in Paper 1, "Exploring the Contexts, Mechanisms and Outcomes"), TADA is experiencing an uptake. This means that a vulnerable patient group is now receiving help in alleviating their anxiety and restoring their oral health. This has implications for society because vulnerable and marginalised groups (such as TADA patients) are more prone to oral diseases and poor oral health (Peres et al., 2019; Watt, 2007; Watt et al., 2018, 2019). Researchers argue that oral health can be a clinical marker of poverty and that there is a rising gap within society between those with good and poor oral health (Watt et al., 2019).Thus, a social implication of TADA is that it diminishes oral health inequalities and contributes to closing this oral health gap.

8.4 Societal implication: Cost of helping

The first programme theory in Paper 1 ("Exploring the Contexts, Mechanisms and Outcome") explains how a full subsidy led to increased patient accessibility, resulting in service uptake. This programme theory adds a ripple effect of increased quality of life to the outcome of service uptake. Patients are reporting back to the service that they have seen an increased quality of life. Accumulated data from service documents revealed that 1,186 patients have followed through with the TADA service (see Paper 1, "Exploring the Contexts, Mechanisms and Outcomes"). The yearly budget for 2020 was 85 million kroner (around 8.5 million euros). The service budget has led to internal debates in the Norwegian dental society on whether it is beneficial to use such an amount of welfare resources on such a small group of people.

Although the service is costly, research supports the necessity of funding such services within the Norwegian context (Halvorsen & Willumsen, 2004). Moreover, while the service aims to alleviate patients' dental anxiety and restore their dentition, the findings from this study indicate that the outcomes extend beyond the circumscribed service outcomes. As outlined in the first programme theory in Paper 1 ("Exploring the Contexts, Mechanisms and Outcomes"), TADA has ripple effects on patients' quality of life, as patients are reporting to the service that they are returning to work and their family and are reengaging with society. The literature supports this, as research shows that oral health expands to other areas of the patient's life, affecting their quality of life and impacting their daily routines (Bastos et al., 2019; Glick et al., 2017; Mehrstedt et al., 2007; Svensson et al., 2018). Thus, the service has implications for improving a vulnerable group's quality of life. Therefore, it is recommended to continue subsidising treatment for vulnerable patients' dental anxiety and oral health.

9 Concluding remarks and directions for future studies

The current study has investigated what works within the TADA service, for whom, under what circumstances, how and why. The initial programme theory that drove the realist evaluation research suggests that *CBT, delivered by dental practitioners, will alleviate the dental anxiety of patients with a history of torture, abuse or dental phobia, allowing them to return to regular dental services.* From multiple methods and perspectives, this study has revealed that catering to torture, abuse or patients with dental phobia is not as linear as the initial programme theory first implies. Therefore, there is no single programme theory to explain what works within TADA, for whom, under what circumstances, how and why. Instead, the study uncovered 10 programme theories that reveal structural and relational features impacting TADA service outcomes. The appended papers outline the programme theories in detail.

In sum, the TADA service works by teams tailoring the service to meet individual patients' needs. TADA dental practitioners are in a supportive environment and placed in proximity with TADA psychologists, leading to knowledge transfer between the two professional groups. This has led dental practitioners to build a repertoire of how to communicate and grade the therapy they deliver to patients who have experiences of abuse, torture and/or dental phobia to meet their individual needs. In addition, the TADA service teams are provided with the resource of time to build a trusting relationship with the patients, which deviates from their traditional performance-led culture being treatment-oriented. From a patient perspective, relational aspects were considered necessary to the success of the programme. Patients explained that a calm, holistic approach by the dental practitioner, paired with positive judgement and predictability, led to them feeling in control and cared for while their self-esteem re-emerged. The theories put forward by patients implies that

the dental practitioners' approach, which leans towards a person-centred care approach, supports the treatment.

Research shows that 15.3% worldwide struggle with severe dental anxiety, which also likely impacts their quality of life (Abrahamsson et al., 2001; Armfield et al., 2007; Mehrstedt et al., 2007; Silveira et al., 2021). Although the theories of this thesis are at the programme level, depicting specific workings of TADA that may be unique to Norway, these programme theories may also be used as a starting point for policymakers and the international community to learn one approach to tackling oral health inequalities and dental anxiety. The current study builds on previous research showing that the exposure component of CBT can be an effective treatment delivered by dental practitioners (De Jongh et al., 1995; Gordon et al., 2013; Haukebø et al., 2008; Kvale et al., 2004; Lillehaug Agdal et al., 2008; Vika et al., 2009; Wide Boman et al., 2013). The main contribution of the current study is that it shows *how* this therapeutic approach was integrated into service delivery and *how* dental practitioners are successful in alleviating dental anxiety.

Being the first scientific evaluation of TADA, this thesis can set directions for future studies. The programme theories outlined in the appended papers build on qualitative data, as the study took a multi-method approach in collecting interview data and service documents. To further understand the workings of TADA the CMOs, the building blocks for the programme theories, can now be empirically tested in larger and case specific studies.

The following paragraphs explains directions for future research. First off, dental anxiety, which in this thesis has only *described* by study participants, can now be tested by integrating quantitative tools - measuring patients' anxiety pre and post TADA treatment. Such a study would be continuing the programme theory refinement, focusing on the outcome of dental anxiety and provide explanatory power to the treatment effect.

Moreover, the second programme theory in Paper 1 ("Exploring the Context, Mechanisms and Outcomes") describes patient heterogeneity as specific to the TADA context, without following up with data from the service deliverer or patient perspective on how this patient heterogeneity affects the service pathway or delivery. Thus, future research can test this programme theory by identifying, and mapping what specific patient characteristics lead to which tailored service pathways (Paper 1, "Exploring the Context, Mechanisms and Outcomes"). To overcome ethical challenges concerned with the risk of retraumatizing patients, one method to collect and identify patient characteristics could be to collect TADA psychologists' assessment notes (Figure 2 in Paper 1, "Exploring the Contexts, Mechanisms and Outcomes"). To fully grapple with the heterogeneity, a study like this would need to be national, identifying all service routes and connecting them to the patient demographics, and identifying if some patients cancelled or required more sessions.

Collecting data that maps the various service pathways and connects it to the patient characteristics could also build on the third programme theory in Paper 1 ("Exploring the Context, Mechanism and Outcome"). The third programme theory points to differences across the country and attributed this to local resources, such as the availability of anaesthesia, available psychological treatment for comorbidities and how patients are paused in treatment. Beyond these contextual elements, hidden mechanisms such as the region's culture and attitude towards these patients could affect how they mobilise local resources and how the county assists. A realist question to ask is what mechanisms are triggered within and between TADA teams, that could also explain the various regional differences. Since the current study only collected patient data from one county, that focused on patient mechanisms, these questions remain unanswered. Thus, future research could map and collect data from each region in Norway, describing the regional differences and asking how these regional differences may impact the service outcome,

which could allow us to come closer to answering the "in what circumstances".

The ripple effects outlined in the first programme theory in Paper 1 suggest that patients enrolled in TADA have an increased quality of life. Thus, future research could look into the lasting measures of alleviated dental anxiety and the efficacy of the TADA service, testing if and how patients' quality of life is increased. For example, quantitative measurement tools could be used to establish if the quality of life was increased. Sequentially, qualitative methods (such as interviews) could be used to increase our understanding of what mechanisms led to this and what is key to the context -leading patients to experience this. Continuing research on that theme could provide more insight into the effects of oral health.

The programme theories in this study explain how dental practitioners lean towards a person-centred care approach. Thus, one could speculate whether a service structured to deliver CBT has a dual effect on the dental practitioner and the patient. For example, when dental practitioners are assigned the task of alleviating patients' dental anxiety through psychological intervention, could this context impact their approach and explain why they lean more towards a person-centred care approach? Could the CBT tools affect more than just the patient but also the approach or culture of the dental practitioner? Thus, future theoretical areas to study could include whether assigning CBT to dental practitioners alters their approaches to patients.

Lastly, the theories presented in this thesis are at the programme level and reveal specific details of what within TADA works for whom and under what circumstances, specific to Norway. Moreover, the choice of collecting data from only one site from the patient perspective has limited the study in understanding patient differences across the country. However, the patients raised the approach taken by the therapist as essential for TADA, insinuating that the humanistic features resembling

a person-centred care approach affected their outcome. Although the theory behind CBT and humanistic therapy is different, this may be indifferent in the light of studies that reveal the mediating effects of the therapists (Wampold & Brown, 2005). Moreover, research shows that whether patients received CBT, psychodynamic therapy or person-centred therapy, outcomes are similar (Stiles et al., 2008; Stiles et al., 2006). Thus, asking what type of treatment works may not be sufficient to understand treatment success. We need also to know who gives the treatment. The mediating role of the therapist has been explained through a set of common factors -a set of similar components found across psychotherapies (Wampold, 2010). The common factors may explain why outcomes are equivalent regardless of therapy and why the therapist has a mediating effect. Continuing the theorising and testing of the programme theories raised in this thesis could benefit from including a more substantive theory -to make sense of what is happening. For example, elements of the theory behind CBT and person-centred care therapy (leaning on the theory behind humanistic therapy) could help explain the mediating role of the dental practitioner and how patients' dental anxiety was alleviated. Therefore, the last direction for future research is to continue the theory refinement, building on the programme theories raised in this thesis, but to include more substantive theories, such as the theory behind CBT and humanistic therapy (for person-centred therapy) or common factors. Continuing the study cycle, theory refinement, and including a more substantive theory, the research could also become more transferable and more applicable for other service developers, while we would also come closer to understanding reality (Pawson & Tilley, 1997).

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Exploring the contexts, mechanisms and outcomes of a torture, abuse and dental anxiety service in Norway: a realist evaluation

Emilie Bryne[1*], Sarah Catherine Patricia Duff Hean[2], Kjersti Berge Evensen[1] and Vibeke Hervik Bull[1]

Abstract

Background: Torture, abuse and dental anxiety (TADA) are often precursors to developing a pathological relationship with dental care due to elevated anxiety. Consequently, patients who suffer from one or more of these tend to avoid dental services. This could leave them with severe tooth decay, which could affect their general and psychosocial health. Norwegian dental services have implemented the TADA service to specifically alleviate dental anxiety and restore oral health for the TADA patient group. However, the service has not been evaluated, and there is a need to understand how and why this service works, for whom, under what circumstances. Therefore, this study aimed to develop theories on how the service's structure alleviates dental anxiety and restores these patients' oral health. Although developed in a Norwegian context, these theories may be applicable to other national and international contexts.

Methods: This realist evaluation comprised multiple sequential methods of service and policy documents ($n = 13$), followed by interviews with service developers ($n = 12$).

Results: The analysis suggests that, by subsidising the TADA service, the Norwegian state has removed financial barriers for patients. This has improved their access to the service and, hence, their service uptake. National guidelines on service delivery are perceived as open to interpretation, and can hereby meet the needs of a heterogeneous patient group. The services have become tailored according to the available regional resources and heterogeneous needs of the patient population. A perceived lack of explicit national leadership and cooperative practices has resulted in regional service teams becoming self reliant and insular. While this has led to cohesion within each regional service, it is not conducive to interservice collaborations. Lastly, the complexity of migration processes and poor dissemination practices is presumed to be the cause of the lack of recruitment of torture survivors to the service.

Conclusions: Policy documents and service developers described the TADA service as a hybrid bottom-up/top-down service that allows teams to practise discretion and tailor their approach to meet individual needs. Being free of charge has improved access to the service by vulnerable groups, but the service still struggles to reach torture survivors.

Keywords: Dental anxiety, Dental phobia, Torture, Abuse, Oral health, Dental health services, Health services, Oral health policy

*Correspondence: emilie.bryne@ihrog.no
[1] Oral Health Centre of Expertise Rogaland, Jorgveien 21 B, 1016 Stavanger, Norway
Full list of author information is available at the end of the article

Background

People subjected to torture or abuse or who have dental phobia may avoid dental services and examinations due to anxiety or the psychological triggers that the dental

setting may stimulate [1–5]. With an ongoing avoidance behaviour of dental services, a fear of 'revealing' their mouth may emerge, leading to deteriorated oral health. This often requires dental services, such as multiple restoration and extractions. The negative cycle that may emerge from avoiding dental services can be both painful and costly for the individual and society as a whole [6–8].

The TADA service

The Norwegian government developed the torture, abuse and dental anxiety (TADA) service in 2010 to address the challenges faced by patients who have survived torture or abuse or who have a dental phobia in their use of dental services [9]. The TADA service is unique in its bi-dimensional approach to targeting both dental anxiety and avoidance behaviour and to restoring patients' oral health. A working group consisting of dental practitioners, psychologists and researchers was established to design and implement a dental service catering to these patients [9, 10], and cognitive behavioural therapy (CBT) was chosen as the main form of treatment for the TADA service. Both national and international research suggests that elements of CBT, specifically *in vivo* exposure therapy, could effectively treat the anxiety aspect, which is assumed to be the precursor to avoiding dental services [11–13]. The underlying assumption was that their oral health could be restored by relieving patients' dental anxiety through CBT. The TADA service aims to deliver an equitable, standardised service to adults (> 18 years) across Norway. However, in Norway, oral health falls under county-level administration. Therefore, each county is responsible for the logistics of service and resource provision.

Patients who are eligible for the TADA service include those with a history of torture with direct consequences for their mouth, neck or head regions. A notable aspect of this patient group is that torture survivors often display comorbidities and likely struggle with post-traumatic stress disorder (PTSD) [14]. As of 2019, approximately 10,000–35,000 torture survivors resided in Norway [15]. Furthermore, patients whose dental behaviours have been impacted by sexual, physical or psychological abuse are eligible for the TADA service. These patients are included in the service due to the elevated risk of developing anxiety in the dental setting. Norwegian national reports reveal that 34% of women and 11% of men have been subjected to sexual abuse and that 1 in 20 children and adolescents have been assaulted [16, 17]. Finally, patients, who meet the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) criteria for suffering from a specific phobia, are eligible for TADA services. The DSM-IV criteria are unreasonable fear, immediate anxiety response and avoidance behaviour or extreme distress, and these symptoms must have a significant impact on the patient's life, must last for at least six months and not be caused by any other disorder [18]. Only one study within the Norwegian context has described the prevalence of dental phobia, and it revealed that 8% of 18-year-olds suffer from this [19].

From here on, the paper uses the word *dental anxiety* to express the challenges of all three patient groups because this is the common denominator for all these patients enrolled in the TADA service whatever the cause. This means that patients with a history of torture or abuse do not need to meet the DSM criteria for a dental phobia to be included in the TADA service. However, if there is no history of torture or abuse, dental phobia, as defined by the DSM, is required.

The TADA service is designed such that, before oral restoration takes place, the anxiety aspect experienced by patients is addressed first. The teams that focus on treating this anxiety through CBT are defined as TADA teams. These teams consist of psychologists and dental practitioners (dentists and dental hygienists). The psychologists assess patients' service eligibility and train dental practitioners on how to deliver CBT. In this way, the service ensures that psychological assessment tools are appropriately used during the service assessment and delivery.

Since early 2011, the TADA service has been gradually implemented as a public service free of charge to eligible patients across Norway [9]. The service's budget has increased yearly, starting at 2.5 million kroners in 2011 to 85 million kroners (equivalent to 8 million euros) in 2020. The budget includes the TADA teams' salaries and its rise can be attributable to the increase of teams nationally. Currently, 52 TADA teams are in place across Norway. The year-long national waiting list reflects the high demand for the TADA service. As of 2018, 1186 patients had either completed or were undergoing dental treatment as part of the TADA service.

However, service outcomes have not yet been evaluated and remain poorly understood. How, for example, is the TADA service structured to cater for such a heterogeneous patient group? The current study addresses this question through a realist evaluation to understand *how the TADA service works, for whom, under which circumstances, and why*. In this paper, we report the findings of the evaluation in terms of the contextual elements, triggering mechanisms and resulting outcomes of the TADA service at a structural level. Although the TADA service is a Norwegian intervention, knowledge of how it is structured and how these structures function in this national context and with this vulnerable patient group, can be transferred to the international setting. These settings also face similar challenges of dental anxiety and

seek to understand how treatment and dental health services for patients with a history of torture or abuse or a diagnosis of dental phobia may be set up.

Our findings related to other dimensions of the evaluation (the role that dental practitioners play in delivering the service and how the service has impacted patients) have been reported elsewhere [20, 21].

Methods

Realist evaluation methodology

To explore the structural workings of the TADA service, we used a realist evaluation methodology [22]. Intrinsic to this methodology was the exploration of for whom and under which circumstances the TADA service is effective and the assessment of its complex programmes and services [23, 24]. This complexity is inherent in the service's interdisciplinary approach and diverse patient population. A realist evaluation is well suited in this regard, as it allows the researcher to more fully describe the working mechanisms of complex systems. Indeed, realist evaluations are becoming increasingly popular for addressing the complexities of health services [22, 24, 25]. Realist evaluations are underpinned by the philosophy of scientific realism, which claims that generative causal mechanisms are triggered by contextual elements that, in turn, produce observable outcomes [22, 24, 26, 27]. This philosophy distinguishes realist evaluations from other types of theory-driven approaches, as it generates data-derived insights with ontological depth. This permits valid explanations for why a given phenomenon works, for whom and under which circumstances [22, 26].

A realist evaluation begins by seeking to explain how a phenomenon like the TADA programme contributes to substantive changes in treatment outcomes [28, 29]. The assumption is that how the service leaders have developed the service was guided by one or more theories. Service developers either implicitly or explicitly rely on these theories when executing the service in specific contexts and circumstances [22]. A vital goal of the realist evaluation is, therefore, to articulate these *programme theories* – namely, to provide plausible explanations for the nature and characteristics of a phenomenon by describing its outcomes, the mechanisms responsible for these outcomes and how these mechanisms are triggered in a given contextual setting [24, 30]. Table 1 presents more precise definitions of outcomes, mechanisms and contexts, in reverse order.

The realist evaluation method deconstructs a phenomenon – in this study, the TADA service – in terms of contexts, mechanisms and outcomes. It then *re*constructs these factors in a series of context-mechanisms-outcome configurations (CMOCs). These configurations of contexts, mechanisms and outcomes yield a proposition about how the phenomenon works, for whom and under which circumstances [22, 25, 31]. In principle, the process involves explicitly making foundational assumptions about how the phenomenon (i.e., the service/programme) should work before systematically collecting evidence to test and refine or refute this theory [22, 25, 31]. Consequently, and circularly, the evaluation process starts with a theory and culminates with a theory. The whole process is, by nature, iterative and retroductive, aiming to elicit the underlying mechanisms believed to reside at an ontological depth.

Data collection

This study employed a multi-method study design to generate the programme theories with two primary data sources: service and policy documents and interviews [32–34]. Consistent with a sequential, multi-method design [35], the analysis of the policy documents preceded the interviews and, thereby, informed the structure and foci of the interview schedule.

Table 1 Definitions and reflections on contexts, mechanisms and outcomes

Contexts (C): These describe the elements and background factors that allow mechanisms to be triggered. Contexts are not limited to locations but also refer to characteristics of individual service developers, deliverers and patients. It refers also to interrelationships between actors and institutional settings and their placement within wider infrastructural settings. To understand contexts, the researcher should ask: *What conditional elements or contextual components must be present for a mechanism to be triggered?*

Mechanisms (M): A mechanism will be triggered, if the context is conducive to this. This conception of mechanisms has two main features: resources and reasoning. The assumption here is that if certain service resources are introduced to a specific context, they will generate changes in the actors' reasoning. In this study, these actors are service developers, deliverers, and patients. Pairing resources with reasoning defines the mechanism. Therefore, the following question is asked to reveal mechanisms: *How do the resources provided by the service impact the service deliverers, and on what assumptions, values, and beliefs do service users rely on when interacting with these resources? What is being triggered in the service, and to what particular outcome does it lead?*

Outcomes (O): Outcomes describe the visible output or impact the mechanisms lead to. These outcomes can be immediate, intermediate, or long term. Therefore, in analysing outcomes, the researcher should ask: *to what end does the triggered mechanism lead and what are the resulting outcomes of the triggered mechanisms in the right context?*

Context–mechanisms–outcome configurations (CMOCs): Generative explanations for the observed outcomes can be produced by heuristically configuring or combining contexts (C), mechanisms (M) and outcomes (O). These CMOCs provide a causative explanation for either the working of the entire service or for specific features of the service.

In a realist evaluation, existing literature in the field can be an extra source of data when developing programme theories. However, in the present study, the results of a literature search on dental services aimed at TADA patients, showed the evidence to be limited. Previous research that has studied the oral status and anxiety levels of these patient groups [14, 36–43] focuses on patient outcomes and ignores the functioning of services that provide treatment for these patients. Our study redresses this shortfall.

Document analysis

A search of service databases and interviews with stakeholders generated a sample of 13 policy documents and service-related grey literature (Table 2). Reviewing these documents provided a historical lens through which to understand why and how the TADA service currently operates and intends to achieve its objectives. The documents also provide descriptions of the key service dimensions, including the desired therapy component (i.e., CBT).

Interviews

The first author emersed herself in the research context by participating in regional and national TADA service meetings, network gatherings and by shadowing TADA practitioners. Throughout this work, she made memos from meetings and kept a reflective journal [44]. The first author has master's-level qualitative interview experience and training.

The sample interviewed comprised professionals responsible for the national and regional development of the TADA service. The TADA service is stakeholder-driven. This means that service developers who initially targeted the patient population, also participated in designing and implementing the service and had various roles in its delivery.

First, key informants were identified in the main service document (Table 2, document number 8) [9] and were purposively recruited based on their role, i.e., their primary involvement in, and responsibility for, the initial service design. As the odontology field within Norway is relatively small, further recruitment occurred through a snowballing strategy [45, 46]. Participants were invited to participate through email.

A total of 14 informants were identified as primary stakeholders who had a direct impact on the TADA service design and rationale. Of these informants, two had retired, but the remaining 12 agreed to participate in the interviews. As two participated in the same interview, a total of 11 interviews were ultimately conducted. As mentioned above, the TADA service is stakeholder-led and implemented. This means that the recruited informants had played key roles in identifying the need for the service, conceiving and implementing the service and acting as service deliverers. At the time the interviews took place, 10 of the 12 informants were also practising service deliverers (either dental practitioners or psychologists). The remaining two stakeholders were members of the dentistry profession but were currently acting as managerial staff. Their role was to oversee the national structure of the TADA service, develop national service guidelines and cultivate cross-sectional learning.

All interviews were audiotaped and transcribed verbatim immediately after they were completed. Stakeholders chose to proceed with interviews at their own clinics or workplaces. Other than the lead author and interviewees, no one was present during the interviews. The average duration of the interviews was 54 minutes. Consistent with the realist perspective, preliminary theories that emerged from the document analysis served as the basis for the initial interviews, the content of which was then used to structure subsequent interviews. Realist interviews seek to identify, explore and refine emergent theories regarding the workings of a given phenomenon – in this case, the TADA service/programme [47]. TADA stakeholders were thus asked to answer questions related to their experiences with and rationale for conceiving, designing, structuring and delivering the TADA service.

Individual, semi-structured interviews were conducted. While focus group discussions may have generated rich data, individual interviews were chosen over focus group interviews due to the geographical distance between the stakeholders participating in the project. In addition, discussions of work practices and vulnerable patients were anticipated to potentially provide detailed and sensitive information, and hence, individual interviews were deemed more fit for purpose [48, 49]. The schedule was semi-structured in nature, which allowed new ideas to be brought up during the interviews, underpinning the explorative approach of this study [50].

Voluntary participation was based on informed consent. Written consent was obtained from the study participants. The Norwegian National Centre of Research Data (NSD) evaluates how to manage and protect data in research projects in Norway ethically. The NSD committee approved this study's data management and handling (Project No: 619754). Due to the nature of this study, not collecting data from vulnerable patients or health information, there was no need for further evaluation by the Norwegian Committee for Medical and Health Research Ethics.

Table 2 Document analyses

No.	Title (translated into English)	Author/Year	Document type	Description
1	*Practitioners Handbook*	Myran, L., Johnsen, I.B., Åroen Lie, ..P., June 2019	Handbook	This handbook provides details on how practitioners should meet and work with the patient group. Details are provided regarding the aetiology of anxiety, and symptoms of dental phobia. Cognitive behavioural therapy and communication methods aimed at enhancing relationship building are elaborated in this handbook.
2	*Practitioners Guidance*	TADA, December 2018	Guidelines on operating practice	This guidance leaflet describes some potential service routes for the patient, resources (such as templates for anxiety treatment), inclusion and exclusion criteria for patients and overal aspects that practitioners should consider (such as colegial support and collaborating with others).
3	Treatment contract and TADA info	TADA	Service aid	The treatment contract supports joint relationships and collaborative work in restoring the oral health of patients.
4	Treatment plan	TADA	Service aid	The treatment plan is a template and outline for each session and describes the small and large goals intended for the patient to achieve throughout the service pathway.
5	Coping plan	TADA	Service aid	This coping plan is jointly completed by the patient and TADA dental practitioner. The coping plan aims to aid in the dental restoration phase, making the patient and the follow-up dental practitioner aware of their anxiety triggers, warnings and the need for adjustment.
6	*Patient Handbook*	TADA, 2019	Guidebook	Patients receive a handbook describing the aim and outline of the service. The handbook includes details on anxiety and trauma and the effects they have on the dental setting.
7	White Paper 35 'Accessibility, Expertise, and Social Equalisation in the Future Dental Health Service'	Ministry of Health and Care Services, 2006–2007	Policy paper	Describes the government's objective to create and offer equal health care services regardless of diagnosis, place of residence, personal finances, gender, ethnic background and individual life circumstances.
8	'Facilitated Dental Health Services for People Who Have Been Subjected to Torture, Abuse or Odontophobia'	The Norwegian Directorate of Health, October 2010	Report	The first report developed prior to TADA teams being established. This report provides a description of different aspects of the patients and the rationale for why they need facilitated dental treatment or therapy.
9	Job description: Dentist/dental hygienist	TADA	Role description	This job description describes the expected tasks that a dental practitioner should execute.
10	Job description: Dental assistant	TADA	Role description	This job description describes the expected tasks that a dental assistant should execute.
11	Job description: Psychologist	TADA	Role description	This job description describes the expected tasks that a psychologist should execute.

Table 2 (continued)

No.	Title (translated into English)	Author/Year	Document type	Description
12	"TADA Survey"	Simonsen, Ø., 2019	Survey	This is a survey conducted by a private dentist (not a TADA service practitioner) who collected thoughts from other (mostly private) practitioners regarding the TADA service. Thirty statements were reported, all of which voiced negative concerns about the workings of the service.
13	'Overall Reporting on the TADA Service'	The Norwegian Directorate of Health, 2016, 2017, 2018, 2019	Report	Yearly reporting of data on the types of patients enrolled in the service, waiting lists, the total number of TADA teams within each county and the economy of the service.

Analyses and data management

The unit of analysis in realist evaluations are programme theories (Table 1), generated from the specific analytical steps outlined below and as displayed in Fig. 1.

Coding

The first step in the analysis involved open coding. The coding procedure consisted of reading the data material multiple times to ensure the first author had a comprehensive understanding before assigning a code name to each portion of the text, with each code corresponding to some aspect of the data, for example, *costly public service.*

Cataloguing

Codes are then reviewed for the purpose of relating them to an area of insight. Once the codes had been related to insights concerning contexts, mechanisms or outcomes (in isolation) with respect to the CMOC as a unit, they were definitively catalogued. For example, the code *costly public service* was catalogued under *context* (see Fig. 1).

Configuring

Understanding the causal links between contexts, mechanisms, and outcomes is central to a realist evaluation. Therefore, identifying the exact CMOC is an important part of the analysis. The CMOC was determined by first identifying the service outcome, which was then used as a guide to iteratively review the data material until the causal mechanisms underlying the outcome were understood. The analysis was directed by *theorising* how this outcome came about (mechanisms) and what about the TADA service generated this outcome (context). Generating this CMOC was as retroductive as it was iterative; that is, the CMOC revealed the interaction and generative association between the context and the mechanism, in turn, leading to the outcome. This in turn, ultimately illuminated the essential connections between the individual components of the CMOC. The first author performed coding, cataloguing and configuring in this study. The trustworthiness of this preliminary analysis was confirmed through discussions of the outcomes of these processes with other authors of the paper, and codes, categories and configuration descriptions were adjusted following discussions.

Another central tenet of realist evaluations is understanding the architecture of the phenomenon. In this study, this meant comprehending how stakeholders designed the service, structurally speaking, to deliver the intended service outcomes. By conceptualising the architecture of the TADA service, its service pathways and delivery roles were also revealed.

For transparency and credibility, quotes are included in the Results section. These quotes were translated by the first author from Norwegian into English and then translated back into Norwegian from English by an independent party. Informants have been kept anonymous, quotes being marked by the profession of the informant (i.e., whether the service practitioner specialises in psychology or dentistry). For confirmability, the third author, who, at the time, was an active TADA practitioner responsible for developing and delivering the CBT training curriculum, member-checked the programme theories and the architectural understanding as this emerged. The qualitative software programme NVivo was used to manage the data [22, 51, 52].

Results

Data analyses revealed four CMOCs describing the structural elements of the TADA service at the macro and meso levels, each of which affected the service outcomes. The micro-level data have been presented elsewhere [20, 21].

The TADA service aims to alleviate dental anxiety and restore oral health. The architecture of the TADA service, and the various pathways this promotes to achieve these end goals, – are presented in Fig. 2. Figure 2 also shows how the TADA service pursues an interdisciplinary approach by combining psychology and dentistry into a single service. Operationally, this means that the service is divided into two departments, each consisting of a separate team tasked with delivering a specific aspect of the service. The first department is staffed by an interdisciplinary team whose focus is on the psychological dimensions of the TADA service. Specifically, this team is charged with mitigating or alleviating trauma or anxiety among patients. The second department is focused on oral health, with its primary objective being the restoration and maintenance of patients' oral health.

Figure 2 depicts the different pathways and processes patients may experience when navigating the architecture of the TADA service and who is responsible for delivering each stage of the service. First, patients initiate contact with the service, which places them on a waiting list. If the patients are in severe pain, they can call a phone number for an acute assessment. The pathway coloured in red indicates the acute route, which, depending on the patient's needs, can provide oral restoration (typically with a general anaesthetic) before CBT. The pathways coloured in black indicate the more typical service routes, however. Once the waiting time for a patient, who did not need an acute assessment, is over, they receive a phone call from a TADA team deliverer to schedule an appointment with the TADA psychologist, who will assess the patient's eligibility for service inclusion. Patients eligible

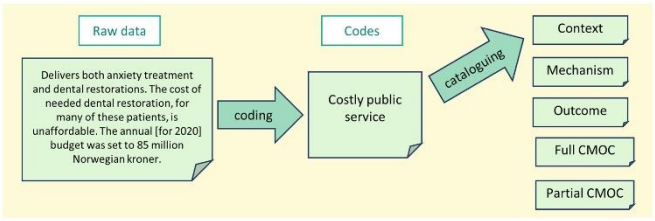

Fig. 1 Steps of coding and cataloguing. The figure shows the steps of coding and cataloguing using an example of text from a policy document

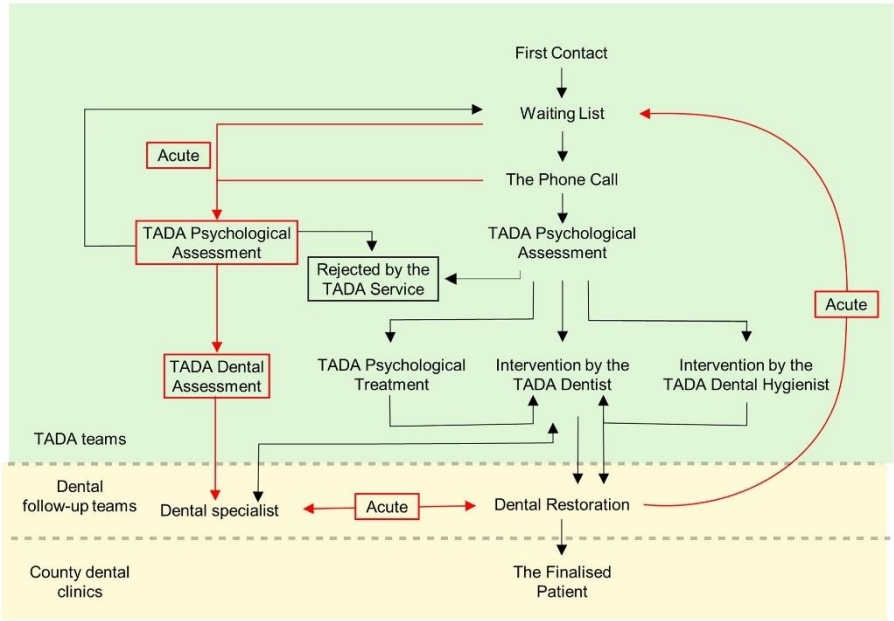

Fig. 2 TADA service pathways

for service inclusion are then given a referral to receive CBT from a dental practitioner or for additional psychological treatment before CBT if required. The TADA teams provide all the actions described above, which the figure depicts in the yellow section. Once the TADA team assesses the patient as having finished the CBT intervention, they move to the phase where their oral health can be restored. The dental restoration is provided by a dental follow-up team, as depicted in the green section of Fig. 2. After their oral health has been restored, county clinics, outside of the TADA service, are contacted to ensure that patients continue to pursue their oral health by regularly attending dental examinations with other services.

CBT is used to obtain a fuller understanding of the interconnections between cognition, behaviour and emotion, which can subsequently be challenged and resolved

through a collaborative, active and direct approach [41]. A major feature of CBT involves exposing the patient to the causes or triggers of their anxiety. This occurs in TADA through *in vivo* exposure therapy in the dental setting. In the TADA service, dental practitioners perform this exposure therapy, which is intended to gradually but directly desensitise patients to the anxiety-provoking aspects of the dental experience [18]. The treatment duration is typically 12 sessions; however, field experience has shown that additional treatment sessions are often needed, with the number of sessions correlating to the severity of the trauma experienced by the patient. Any dental treatments administered by the psychologically oriented TADA team during exposure therapy aim to alleviate anxiety. It is not about restoring oral health at this stage. The purpose here is to motivate patients to continue to pursue and eventually achieve dental restoration via the dental follow-up team after their anxiety has been effectively managed.

Upon completing CBT, the dental follow-up team takes over and is tasked with restoring the patient's oral health. The follow-up team's primary responsibility is to restore the patient's oral health to an *acceptable* standard. This means that the patient should experience no oral pain discomfort or diseases, have satisfactory functionality and they should be able to communicate and participate in social settings without experiencing oral pain or other complications [53]. In collaboration with the patient, the dental practitioner in the TADA team decides when this transition to the follow-up team occurs.

Programme theories

We developed our programme theories based on causal chains between contexts, mechanisms and outcomes in the TADA service architecture, as presented in Table 3 below. There were four discrete CMOCs that emerged.

Programme theory 1: subsidising the TADA service means oral health becomes a public project and dental avoidance behaviours become a public health concern. This consequently improves patient access and service uptake

In Norway, patients over 20 years old are responsible for paying their dental care. In our research, both policy documentation and service developers indicated that the cost of dental treatment could be a prohibitive factor for these patient groups. Without assistance, these patients could be unable to afford the restoration of their oral health. Thus, through state subsidies and a bi-dimensional approach, the TADA service contributes to the accessibility of dental treatment for this populations. This addresses not only cost issues but also anxiety-related behavioural issues. Government subsidisation of the TADA service means a shift in the way oral health care is viewed. There is a shift from viewing dentistry as a private service provision to a public service. It places oral health in the foreground among public health concerns. As depicted in the first CMOC (Table 3), reports reveal a service uptake among patients who presumably would otherwise have avoided dental services. Furthermore, service developers' interviews revealed that they believe service enrolment has ripple effects on these patients. Patients report that they feel more capable of re-engaging in society and describe components linked to an increased quality of life.

> *It is clear that such a service like this, it's costly, yeah … but it provides quality of life… It has large effects, then, for a lot of people. (Interview 3, service developer within dentistry)*

> *I think that, when I see a bill of 200,000 [Norwegian kroner, equivalent to 20,000 euros], I think, 'money well spent.' For there may be someone who gets back to work, one who manages to be a mother or father again and can live normally, as a normal human being – get their dignity back. So, I'm pretty sure that Norway will get the TADA money back in, yeah … with good returns later, not that year, but in a few years. I'm pretty sure it will earn itself back. (Interview 10, service developer within psychology)*

> *I think that the TADA service has succeeded in helping many people. Oh lord, compared to when I started … a lot of people get help. It's been on the agenda; everyone knows about it. This is not a thing the dentists can push away anymore, sweep away. So, the project is successful, I think. (Interview 8, service developer within dentistry)*

Programme theory 2: catering to a heterogeneous patient group means adapting and tailoring the service to regional resources and patient requirements

The service policy directed by the Norwegian Health Directorate allows a degree of regional autonomy and professional interpretation regarding *how* practitioners should deliver the service. The patient group is described as heterogeneous (suffering from dental phobia or different types of traumas resulting from torture or abuse) and is complicated in terms of socioeconomic status, health and other life circumstances. Service developers, therefore, viewed a *standardised* service as inadequate and instead adapted the service in light of local resources and patient requirements. Local resources may include the use of anaesthesia and the incorporation of additional psychological therapy but may also entail *pausing* the patient during the service pathway. Pausing the patient

Table 3 Context-mechanisms-outcome configurations (CMOCs): the building blocks for programme theories

CMOC	Context	Mechanism	Outcome
Number 1, relates to programme theory 1	TADA is a state-funded service. It delivers both anxiety treatment and dental restoration. For many of these patients, the cost of dental restoration is unaffordable. The 2020 annual budget for the service was 85 million Norwegian kroners (around 8 million euros).	*Increased accessibility*: a vulnerable group can access services they would otherwise be unable to afford. This makes it easier for these patients to improve their oral health. *Altered focus*: The service shifts from private to public.	An immediate outcome for patients is increased accessibility to services and hence increased service uptake. There are ripple effects for patients including improved quality of life.
Number 2, relates to programme theory 2	National guidelines set by the Norwegian government are open to interpretation. Some patients are in difficult life situations and may not always benefit from the full CBT dimension of the TADA service. Patients are heterogeneous in character.	The TADA teams *tailor* their approach by learning what the patient needs and they search for local resources in order to meet these needs.	The service delivers treatment, improving the oral health of patients who follow the service pathway. Not all patients meet the clinical assessment criteria for of alleviation of dental anxiety.
Number 3, relates to programme theory 3	The Directorate of Health controls the service. There is a lack of common meeting arenas. There is a lack of explicit leadership and guidelines from the Directorate of Health. Poor communication exists across teams (nationally and regionally). County legislation affects service delivery.	TADA teams become *self reliant* and *protectionist* in their work.	The individual TADA teams work cohesively as a team but separate from other teams in the region.
Number 4, relates to programme theory 4	There is an increased incidence and severity of torture methods in countries from which migrants have fled. Accounts from the Directorate of Health reveal that few torture survivors have applied for the TADA service. Teams have adjusted to accommodate patients more quickly. There is possibly a lack of sufficient advertisement for the TADA service. When fleeing from conflict areas and trying to resettle in a new country, individuals do not necessarily prioritise dental anxiety and/or dental restoration. This patient group undergoes a long asylum interview in which their backgrounds are checked, and they are asked to describe their torture experiences. Being asked to do so again may be exhausting.	The patients may find the asylum process *overwhelming*. Their dental health is *not prioritised* at this given time. Patients were *unaware* that such a service exists.	The service is unable to reach and accommodate patients who have suffered from torture.

means postponing therapy or dental restoration until the patient considers themselves ready to proceed. By adapting the service to local resources, TADA practitioners can tailor the service according to what it can realistically offer and what the patient can realistically achieve. This implies that some patients may receive complete dental restoration without meeting clinical outcomes of alleviated dental anxiety. Nonetheless, by being flexible and tailoring services according to available local resources and realistic goals, TADA practitioners can improve their patients' oral health. In their own words, practitioners believe in finding the service pathway best suited to the needs and capacities of each patient.

> *They are difficult to catch because they often have comorbidities; they have other issues in their life. And we have patients that I have given anaesthetics to [for dental restoration] and put on hold, because – I remember clearly a young lady, like 27 to 28 years [old], child welfare services were at the door, new little girl, little daughter, beaten by the partner, had a security alarm and ... lived what you would call a difficult upbringing. Of course, she was being assessed for PTSD ... and then she started feeling pain in her teeth, so she felt she needed to deal with that, and for her to come once a week for CBT and twice a week for PTSD treatment and meet with child welfare services and no [...] It became too much for her. (Interview 3, service developer within dentistry)*

> *What is being successful for the patients? [...] We have limited the goal. Previously, the goal was to go to the dentist regularly, but now we have seen that it's too much for her in this round, so then we have said that the goal for this round is to have a clinical examination so that she can receive treatment under anaesthesia if necessary. [...] but sometimes we just have to, we just have to adjust the goals a bit. If people are traumatised and are not capable of carrying out the treatment with tartar and sprayer and drill and all of those. (Interview 4, service developer within psychology)*

Programme theory 3: a national service, operated by individual satellites, leads to a lack of communication, nationally and regionally, and isolation of each service from others

The Norwegian Directorate of Health seeks to maintain a similar standard of service across the country. This is achieved nationally by controlling service guidelines, implementing regulations and providing policies. However, the management of local resources and logistics is the responsibility of each county and each TADA team. This county-level compartmentalisation creates divisions between regional teams and how they implement and interpret the expectations expressed by the Directorate of Health. This hampers the delivery of the same standard of service across the country. These divisions, coupled with the lack of mutual meeting arenas, absence of explicit leadership and gaps in ministry guidelines, foster team isolation and impede effective communication and collaboration between the different TADA teams.

As a result, individual TADA teams have become more self-reliant and efficient at resolving challenges with local solutions, which are often not shared with other teams. There is however little consensus, either regionally or nationally, on how to interpret national guidelines or how much each team should adapt the treatment to the different patients' needs. Despite these limitations, and perhaps because of them, each TADA team has become more cohesive.

> *I probably feel that we, to a high degree, have become satellites at each of our clinics who've developed our own way of working ... And, maybe a bit too protectionist in that, and instead of using the days – the semi-annual meetings for something very constructive, it's very quick for everyone to just sit down to tell how they are doing it. And we develop some solutions for things, because the guidelines are okay – but less specific [...] And when there is no common location there are no common meetings between the psychologists; for example, there is no regular hospitality with each other, no common meeting points ... no line between us and management. (Interview 11, service developer within psychology)*

> *The Directorate of Health wanted this particular service to be a public offer. In that it's public, they would also be in control of it [...] in that it would be an equal offer... and that people working with training ... according to a plan, and that the plan was quality assured ... (Interview 7, service developer within dentistry)*

> *Internally, we are stuck, each in our own cave. (Interview 4, service developer within psychology)*

Programme theory 4: lack of recruitment of torture survivors to the TADA service is explained by challenges that patients experience because of the migration process and poor dissemination practices

Although Norway is believed to host between 10,000 and 35,000 torture survivors, patient demographics from the TADA service show that only 21 patients were torture survivors during the period from 2012 to 2018. Several initiatives have been made to increase service access for this

population, such as minimising the waiting time for admission and ensuring the presence of independent interpreters. Thus far, however, this approach has had a minimal effect. One explanation for this, according to stakeholders, is that torture survivors are already overwhelmed by the extensive paperwork they must complete when entering Norway, making registration for the TADA service an additional burden. Another potential explanation is that oral health for such patients is simply not a priority when compared to the challenges involved in resettling in a new country and attempting to fit into a new society.

Service developers considered a third possibility: patients may be unaware of the TADA service due to a lack of flyers, posters and other advertisements at asylum facilities or transcultural centres, and that word of mouth is just not effective at reaching this population. Simply put, the TADA service is currently unable to reach and treat torture survivors, one of its three target groups, and a possible explanation is that these patients may be overburdened or may not be aware that the service exists.

> *A lot of them [asylum seekers] feel the TADA treatment is too extensive. They have to get to a certain place, so they would rather have treatment at a clinic that is near the school where they attend … where they are often attending introductory programmes … To be gone for a whole day, well, that can be difficult. […] I definitely think they should have an offer, but I'm not really sure if … like, a lot of people have told me, 'No, do I need to speak to a new psychologist? I have a psychologist. Can't he/she do this?' (Interview 1, service developer within dentistry)*

> *[The informant imitates a patient] 'You know what, now I have finally got, after many years fleeing, then I finally got a residence permit, got myself a house, Norwegian, of course.' – There is a lot to establish in Norway; to start such an anxiety treatment or dental treatment is not on the priority list. So, we have tried very hard to recruit them, despite persistent attempts to make a deal with the municipality about a two-week waiting list, and we have invited them to cooperation meetings. (Interview 4, service developer within psychology)*

Discussion

This realist evaluation of the TADA service revealed that service developers are guided by four main programme theories explaining service outcomes at a structural level.

In our first programme theory, we describe how, in a context in which a service is state-subsidised, oral health shifts from being a private to a public concern. This results in an increased service uptake for TADA patients. Seen from a service perspective, this means that, by removing financial barriers, services like the TADA service hold the potential to reach a patient population that has otherwise been found to avoid dental services. Subsidising dental services and making oral health a public health concern has been the target of an ongoing debate in Norway. Currently, adults in Norway are expected to care for their oral health privately. The TADA service is an exception to the Norwegian norm by offering a bidimensional service that covers both psychological and dental needs free of charge.

Providing a subsidised service that tackles both psychological and dental needs implies that the Norwegian state addresses and acknowledges the severity of oral health neglect, as it now provides an equitable oral health policy at a societal level [54, 55]. Cost is only part of the complex issue of oral health inequality and by including oral health services as a government priority, the government acknowledges that oral diseases and achieving oral health is a critical aspect of a more holistic health picture [56, 57]. Oral health inequality is currently the subject of heated national debate due to the increasingly wide societal gaps between those who can afford dental care and those who cannot [54]. Consequently, when access to dental care is unequal, social inequality worsens, as only those able to afford such care will benefit from it [54, 58–61].

Further, patients may not be initially motivated or able to pay for psychological treatment that would enable them to access dental services more easily. In Norway for instance, studies have indicated patients' lack of willingness to pay for dental care after receiving CBT, practising relaxation methods or receiving nitrous oxide sedation in the dental restoration process [62]. The results of this study revealed that patients were less willing to pay for such procedures pre-treatment (24%, $N = 65$) but were more willing to do so post-treatment (71%). Based on these findings, the authors argued that patients might avoid treatment unless or until it is subsidised [62]. This reflects international studies such as those described by Gulliford and colleagues [63] who discussed the meaning of health care access within the National Health Service in Britain and found financial barriers to be a significant deterrent to service utilisation and access for vulnerable patients [63, 64].

Programme Theory 1 also describes how, by providing a service through which patients can have both their psychological and oral needs met, service deliverers are able to observe how their patients are re-engaging in society and experiencing an improved quality of life. When patients have restored their oral health, their fear of 'revealing' their mouth [7, 65] diminishes, allowing them

to re-engage and participate in society [65, 66]. This confirms research from countries like Germany, Sweden and Brazil who also link quality of life and dental fear, dental pain and dental access [66–68].

Our second programme theory revealed that service developers acknowledge that some methods will work for some patients, but not others, and that this depends largely on the local resources that a team can manage to acquire and on what patients realistically can achieve in light of their heterogeneity. There is a balance to be achieved between customising the service to meet individual patient needs and adhering to organisational standards. This is typical within health and welfare services and can be challenging for TADA teams. In their position, they are required to interpret organisational guidelines and practise professional discretion through direct contact with patients. For their part, the TADA teams have a sense of autonomy, as the TADA guidelines do not explicitly mandate how the service should meet its end goal of providing patients with an acceptable level of oral health. Thus, they are permitted to use their professional discretion when following the pathways depicted in Fig. 2. This means there is flexibility and room to adapt the TADA service to the specific patient's needs and requirements. As the service is currently structured, the service deliverers can practise discretion, allowing them to customise the service to accommodate the patients' needs without being overly constrained by the Directorate of Health's top-down expectations. The TADA service's approach to this reflects, what other authors have described, as a hybrid solution that incorporates both top-down and bottom-up approaches [69–71].

Our third programme theory examines how the TADA service is situated within a context in which there is a lack of joint meeting arenas and centralised leadership and where there is a certain ambiguity generated by county-level compartmentalisation and poor communication between teams. In such a context, our analyses revealed that teams are compelled to be more self-reliant and protectionist about their work, and as an outcome, they must operate in isolation. Therefore, as it presently stands, the structure of the service is not conducive to the cultivation of a national standardised service.

Nevertheless, working in isolation was also found to enhance a sense of team membership and, thus, foster greater cohesion. When teams share a set of assumptions and demonstrate like-minded thinking, this cohesion can be strengthened [72]. A strong team cohesion could be important, as this could translate to better performance, primarily because the team members can trust each other's professional skills [73]. In other words, psychologists and dental practitioners can lean on each other's discretion. Notwithstanding, as the contextual backdrop of the TADA service is devoid of national meeting arenas and bilateral meeting places, team-based solutions to service challenges typically remain within each team. This, in turn, prevents teams from learning from each other's experiences, which is problematic given that local solutions and innovations could be beneficial for the TADA service nationally.

The research presented in our fourth programme theory specifically addresses torture survivors. We found that the TADA service is unable to accommodate torture survivors and that its current design appears to be ineffective at reaching and enrolling this target service population. Therefore, there could be a lack of understanding of the circumstances torture survivors find themselves in. This may explain the failure of the TADA service to reach this targeted patient population [74]. The literature on torture survivors is limited and focuses mostly on the quantitative reporting of their dental status, which is often poor [14, 38], thereby underscoring the need for the TADA service. One Australian study [75] found that barriers, such as long waiting lists and a lack of interpreter services, discourage torture survivors from enrolling in available dental services. However, programme theory 4 demonstrates that the TADA teams do adjust waiting times and invite independent interpreters to participate in the service but that despite this, the requirements for asylum seekers remains overly bureaucratic and often overwhelming for patients.

By studying the TADA service's contexts, mechanisms, and outcomes outlined above, we can better understand how the structural components of a dental anxiety service may address the needs of vulnerable patient groups. Based on these findings, we now provide specific recommendations for policymakers looking to implement similar services (Table 4).

Limitations and future directions

The study design took an exploratory approach to understand the context, mechanisms and outcomes of the TADA service. This has allowed us to come closer to answering why and how the TADA service works, for whom and under what circumstances. Therefore, the project has, in the Norwegian setting, presented an initial set of programme theories from the TADA service developers' perspective to explain how services for patients with dental anxiety and/or trauma may function. The in-depth exploration of the perspectives of this group offers rich insight into how this setting is currently functioning.

However, we accept our limitations concerning the generalisability of the findings. The current sample size of 12 participants of this exploratory study could be considered small but as such is representative of the size of the small pool of stakeholders in the Norwegian setting

Table 4 Recommendations based on our programme theories

Programme Theories	Recommendations
Programme theory 1: subsidising the TADA service means oral health becomes a public project and dental avoidance behaviours become a public health concern. This consequently improves patient access and service uptake	We recommend that policy makers consider public-subsidised anxiety treatment and dental services for patients with a history of torture or abuse or with dental phobia to promote successful service uptake and potentially impact these patients' quality of life.
Programme theory 2: catering to a heterogeneous patient group means adapting and tailoring the service to regional resources and patient requirements	We recommend a hybrid bottom-up and top-down approach when designing dental services that address both the psychological and dental needs of vulnerable patients. A hybrid approach would allow the TADA team to interpret national guidelines, often set to meet a larger population, to match their local context. Allowing for this flexibility, means that service deliverers would be in a better position to use their professional discretion. National guidelines should be seen as service enablers rather than service constraints.
Programme theory 3: a national service, operated by individual satellites, leads to a lack of communication, nationally and regionally, and isolation of each service from others.	We recommend an increase of opportunities for regional TADA teams to meet. These events could range from annual service conferences, that encourage the exchange of local solutions, to interactive digital platforms on which cases could be easily shared and discussed. The latter is a timely option given the current COVID-19 pandemic.
Programme theory 4: lack of recruitment of torture survivors to the TADA service is explained by challenges that patients experience because of the migration process and poor dissemination practices	We recommend that service developers develop specific recruitment strategies for torture survivors, perhaps collaborating with institutions that process migrants and asylum seekers at their point of entry into Norway. These collaborations should seek to relieve first the administrative pressures currently placed on migrants and, secondly, clearly include their dental health needs in the entry process. Upon uptake, service deliverers, working in services such as TADA should be particularly cogent of the specific needs of torture survivors and their associated psychological and dental needs/treatment.

who currently play an active role in service delivery regionally and nationally. Further, the TADA service is unique to the Norwegian setting, which compromises the transferability of our findings to the international arena, even where the need for services for patients with dental anxiety and/or trauma is shared. Nevertheless, we have maximised transferability through a detailed description of the TADA setting. To overcome our small sample size, we supplemented our data with policy documents relevant to answering our research question. We would recommend, however, that future research explore the programme theories held by service developers of similar services internationally and compare and contrast these with the ones we have found here in Norway. In realist evaluations, programme theories are constantly being refined. The theories developed from the individual interviews and documentary analysis conducted here could be enriched with the use of focus group interviews with the stakeholders, or multiple individual interviews, to give the stakeholders opportunity to refine their programme theories. However, 12 of the 14 stakeholders identified as key participants in our study were located across the country and had busy schedules. Thus, multiple interviews or focus groups at mutual arenas were currently difficult to orchestrate. If opportunities are provided for more collaboration events between services (Table 4), these opportunities may arise in the future. We also recommend that programme theories be further refined by including the patient perspective [20].

Conclusion

The bi-dimensional structure of the TADA service, which provides both anxiety and dental treatment free of charge, has increased service uptake among a vulnerable patient population that otherwise tends to avoid dental services. Service developers believed that a hybrid bottom-up and top-down approach is beneficial and allows teams to practise professional discretion and tailoring the service to meet the needs of individual patients. Individual TADA teams are cohesive structures but there is a lack of regional or national consensus and communication. Lastly, there is an uneven uptake of the TADA service, with torture survivors apparently failing to take use of the service. Further research should look at refining the programme theories presented in this paper with patients themselves and supplementing the triangulatory data method, which could enhance the understanding of why and how the TADA service works, for whom and under which circumstances.

Abbreviations

TADA: torture, abuse and dental anxiety; CMOC: context + mechanism = outcome configuration; CBT: Cognitive behavioural therapy; PTSD: post-traumatic stress disorder; NSD: The Norwegian National Centre for Research Data.

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Authors' contributions
EB, SH, KB and VHB were involved in formulating the problem, structuring the study's design and interpreting the results. EB wrote the main part of the manuscript. All authors accept responsibility for authorship and agree to be accountable for this article. The authors read and approved the final manuscript.

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Availability of data and materials
The data material and analyses were written and conducted in Norwegian. Upon reasonable request, the data material will be translated and made available from the corresponding author.

Declarations

Ethics approval and consent to participate
Voluntary participation was based on informed consent. Written consent was obtained from the study participants. The Norwegian National Centre of Research Data (NSD) evaluates how to ethically manage and protect data in research projects in Norway. The NSD committee approved this study's data management and handling (Project No: 619754). Due to the nature of this study, not collecting data from vulnerable patients or health information, there was no need for further evaluation by the Norwegian Committee for Medical and Health Research Ethics.

Consent for publication
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Competing interests
The authors declare that they have no competing interests.

Author details
[1]Oral Health Centre of Expertise Rogaland, Torgveien 21 B, 4016 Stavanger, Norway. [2]Faculty of Social Sciences, University of Stavanger, Postboks 8600 Forus, 4036 Stavanger, Norway.

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ORIGINAL ARTICLE

More than just a dental practitioner: A realist evaluation of a dental anxiety service in Norway

Emilie Bryne[1,2] | **Sarah Hean**[2] | **Kjersti Evensen**[1] | **Vibeke Bull**[1]

[1] Oral Health Centre of Expertise, Stavanger, Rogaland, Norway

[2] Faculty of Social Sciences at the University of Stavanger, Stavanger, Norway

Correspondence
Emilie Bryne, Oral Health Centre of Expertise, Torgveien 21 B, 4016 Stavanger, Norway.
Email: emiliebryne@throg.no

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Abstract

Patients with dental phobia or a history of trauma tend to avoid dental services, which may, over time, lead to poor oral health. In Norway, a specific service targets these patients by providing exposure therapy to treat their fear of attendance and subsequently enable oral restoration. Dental practitioners deliver the exposure therapy, which requires a role change that deviates from their traditional practice. This paper explores how – and under what circumstances – dental practitioners manage this new role of alleviating dental anxiety for patients with a history of trauma or dental phobia. Using a realist evaluation approach, this paper develops theory describing which contexts promote mechanisms that allow practitioners to alleviate dental anxiety for patients with trauma or dental phobia. A multi-method approach, comprising service documents (n = 13) and stakeholder interviews (n = 12), was applied. The data were then analysed through a content analysis and context-mechanism-outcome heuristic tool. Our findings reveal that dental practitioners must adopt roles that enable trust, a safe space, and gradual desensitisation of the patient to their fear triggers. Adopting these roles requires time and resources to develop practitioners' skills – enabling them to adopt an appropriate communication style and exposure pace for each patient.

KEYWORDS
abuse, cognitive behavioural therapy, dental phobia, professional role, torture

INTRODUCTION

Dental phobia is an anxiety disorder [1] characterised by a deep, persistent and disproportionate fear of the dental setting. It elicits intense anxiety responses mimicking a panic attack and preventing patients from seeking out or attending dental services [2–4]. Patients with previous trauma – be it physical or emotional and caused by sexual abuse or torture – may likewise avoid dental services, as dental settings remind them of their trauma and psychologically trigger a physiological, cognitive, or emotional response [2, 3, 5–8]. These patients tend to have relational challenges: They struggle to trust dental practitioners and do not feel safe during dental examinations [9–12]. Consequently, dental practitioners tend to meet these patients only for acute dental problems, which then are more severe and complex [3, 13–15].

In light of these psychological triggers, dental practitioners must deal with more than just oral pathologies [11, 16, 17]; they must also address patients' psychological needs. Empirical evidence shows that specialised treatment such as cognitive behavioural therapy (CBT) may be effective in alleviating dental anxiety, enabling oral health restoration

for trauma and phobic patients [18, 19]. However, to the best of our knowledge, few countries offer services customised for the psychological needs of the type of patients described above, even though this patient group is substantial: in Europe, 8–25% of the population have been subject to physical abuse, 7–22% to sexual abuse, and 13–45% to emotional abuse [20]. There is also increased migration to Europe from countries known to use torture [21, 22]. Prevalence studies on torture survivors in Europe are limited, but in Norway alone, it is estimated that 10,000–35,000 torture survivors reside [23]. In the latter national context, the TADA service (translated abbreviation for torture, abuse, and dental phobia) addresses the shortfall in services for these patients by targeting specifically those subjected to torture or abuse who have been diagnosed with dental phobia. The service includes the psychological intervention of in vivo exposure therapy.

In vivo exposure therapy is a CBT approach relying on direct and active exposure to the dental setting and dental utilities, simulating a 'real-life' scenario. The therapy tests catastrophic thoughts by stimulating an initial, less intense fear response. This desensitises the patient and is the treatment choice for specific phobias [7, 18, 19, 24, 25]. The TADA service, through the inclusion of exposure therapy, has two intended outcomes: first, to alleviate dental anxiety, and subsequently, to restore oral health.

Therapeutic interventions are in the psychological domain and are primarily administered by a psychologist [18, 19]. However, using dental practitioners in a natural real-world clinical setting is logistically and therapeutically advantageous [2]. However, only a few studies are available that explore how dentists include CBT sessions in their dental routines [26–29]. These studies recommend one to five exposure sessions administered by a dental practitioner and find that dental practitioners applying this therapy successfully alleviate patient's dental anxiety, indicating that dental practitioners can address psychological needs through CBT [26–29].

The TADA service consists of interdisciplinary teams of both psychologists and dental practitioners. The psychologists oversee dental practitioners' training in exposure therapy while dental practitioners execute the therapy. Psychologists are available to guide the dental practitioners if the latter are unsure of patients' responses to the therapy or worried about re-traumatisation. Psychologists are in charge of initial patient screening, assessing whether they meet the diagnostical criteria of dental phobia according to the Diagnostical and Statistical Manual of Mental Disorders-V (DSM-V) [24]. Seven diagnostic criteria outlined in the DSM-V relate to pathological responses impairing daily routines, or social or occupational life. The pathological responses are emotional, cognitive, and physical in character, and include avoidance behaviour, catastrophic thinking, feeling powerless, fear of losing control, chest pain, trembling, racing heartbeat, nausea, and trouble breathing.

These responses may arise for patients with a history of trauma because the dental setting can be reminiscent of the trauma incident, for example, in having an authoritative figure hovering over them while they are lowered in the chair, with a bright light shining directly above their face, and sharp tools administered in their mouth without their control [30]. However, this link between the trauma incident and the dental setting is not always present [10, 16, 31].

There is some differentiation in the screening of patients to be admitted to the TADA service, dependent on the nature of their trauma history. For example, the service distinguishes between torture and abuse survivors, with abuse survivors having to display at least one phobic response as outlined in the DSM-V anxiety assessment, whilst torture survivors do not need this. However, all patients admitted to the service receive exposure therapy and therefore, in this study, we define and refer to the entire patient population receiving the service as TADA patients. The service is currently free of charge, eliminating cost as a barrier to patient attendance.

None of the studies exploring how CBT applied by dental practitioners [26–29] investigate the role change required by those practitioners to attend to patient's psychological needs. This new role, a change from focusing on mouth pathologies to anxiety triggers, is outside the remit or competence of most dental practitioners since psychology is not a required subject in dental schools [32, 33]. It is also potentially problematic; the culture of dental care being influenced by performance-led actions rather than relational aspects. Thus, there is a need to better understand how dental practitioners must divert from their traditional profession to deliver psychological interventions. Hence, this study aims to explore how, and under what circumstances, dental practitioners are alleviating dental anxiety by delivering exposure therapy for patients with a history of trauma or a dental phobia using a realist evaluation approach.

Realist evaluations address the question of 'what works, for whom, in what circumstances' [34, 35]. The realist evaluation methodology is increasingly popular in health service research [35], as it captures the complexities of services by articulating the contexts and mechanisms through which service outcomes are achieved [34–36] and seeks to address these issues through a theory-driven approach [37].

A theory explaining how the service works is developed and tested by generating an understanding of the interplay between contexts (answering the question of *Who and in what circumstances?*), mechanisms (a pairing of resources and reasonings – answering *How and why?*), and outcomes (*What works?*). This interplay reveals a causal chain – described as a context-mechanism-outcome configuration [35]. The research question in this study was formulated in a realist manner, as were the methodological choices. To operationalise this research question, research sub-questions were phrased and are presented in Table 1.

TABLE 1 Detailed research sub-questions based on context, mechanisms, and outcome components of the realist evaluation framework

Component	Realist evaluation framework
Context	The realist researcher seeks to understand a service's workings based on the context into which the service is introduced. The assumption is that operating mechanisms, leading to outcomes, are contingent on these contextual elements. To uncover the contextual elements, the researcher looks into the institutional setting, social interactions, interrelationships and political agendas. These are all background factors describing the contingency to the mechanism and enhancing the understanding of the 'for whom in what circumstances'. In this research study, the first research questions are: *What conditional elements or contextual components are particular to the TADA environment? What is unique to the TADA service's background, that allows the functional mechanisms within it to trigger?*
Mechanism	The realist researcher searches to uncover 'why and how' a programme has observable outcomes. They do so by uncovering generative and causal mechanisms. The concept of the mechanism has two main features: resources and reasoning. The researcher thus explores the programme resources introduced into a particular context, to then understand the response and reasonings behind stakeholders introducing or using these resources in a particular way. Here, the research questions are thus: *What unique resources are introduced through the TADA service? How do these resources, provided by the TADA service, impact on the behaviours, assumptions, values and beliefs of dental practitioners when interacting with these resources?* Furthermore, *what is being triggered in the TADA service, leading to any one particular outcome?*
Outcome	The outcome describes what the generative mechanism leads to, in the specific context. It is the observable result seen in the service parameters. The research questions are: *What does the triggered mechanism lead to? What are the resultant outcomes when a particular mechanism is triggered? Within the TADA service, which outcomes are the dental practitioners observing? What change is the TADA service experiencing?*

A central concept in realist evaluations is that services are theory incarnate, that is, that there is an underlying theory held by the stakeholders involved that steer the service in a direction to reach its desired outcomes. Therefore, the first step of a realist evaluation is to elicit this underlying theory by defining the initial programme theory [37]. The initial programme theory informs the study design and what types of data are of interest to further inform and refine the programme theory. The steps of a realist evaluation are cyclical. Once the initial programme theory is described, data are collected to inform and refine this programme theory accordingly. The informed and refined initial programme theory is programme specific. There is no strict rule in eliciting the initial programme theory; the initial programme theory can emerge from service documents, stakeholder interviews or previous literature. Our initial programme theory was elicited through the main service document provided by the Norwegian Directorate of Health [38], which asserts that a treatment intervention based on CBT principles, specifically using exposure therapy, for patients with a history of trauma (resulting from torture or abuse) or dental phobia (context) will alleviate their associated dental anxiety (mechanism), enabling them to attend oral restoration (outcome).

This paper reports on findings that refine this initial programme theory, now that the service is in place, through a realist evaluation of the TADA service. Some of the findings of the realist evaluation relate to how the TADA service's structural features work, for whom and under which circumstances, and are reported elsewhere (preprint available at https://doi.org/10.21203/rs.3.rs-279468/v1). This paper reports instead on the role of the dental practitioner role in this service as they perform this new psychological role of exposure therapist.

MATERIAL AND METHODS

A multi-method design consisting of semi-structured interviews and document analysis was undertaken.

Stakeholder interviews and service documents

In realist terms, stakeholders are key individuals possessing details that inform and refine the initial programme theory [34, 35, 39]. Via purposive and snowballing procedures [40, 41], we recruited stakeholders – using the main TADA service specification document [38] as a starting point. The stakeholders recruited were dental practitioners, psychologists, and managerial staff of the TADA service, covering all regions in Norway. All stakeholders had participated in conceiving and implementing the TADA service and were active in some part of delivering the service at the time of the interview.

A total of 13 informants were identified as possessing relevant information, leading to 12 interviews. Seven of the 13 had a background in dentistry; the remaining six had a psychology background.

The first author conducted all interviews, which were transcribed verbatim immediately afterwards. The interviews were realist informed, such that the interview guide was built around the initial programme theory yet was exploratory in nature, including questions on other aspects of the service (e.g., service structures and collaborations). Interviews were semi-structured, allowing follow-up questions to emerge that explored some of the key assumptions the stakeholders held about how they thought the service functioned. The semi-structured nature of the interview, through comments

and clarifications, allowed a 'teacher-learner cycle' to emerge, in which the interviewer takes the learner role exploring with the stakeholder their key assumptions, as teacher [34, 39].

A search through local servers and government databases led to 13 relevant service documents describing the historical context, rationale for service deliverance, role descriptions and desirable policy outcomes. These documents were supplemented with what stakeholders found relevant to the service's implementation and practice (Table 2).

To ensure the trustworthiness of the data collection procedures, the first author immersed herself in the TADA field by tracking dental practitioners in meetings, experiencing exposure therapy sessions, and practising reflexivity by journaling. The Norwegian National Centre of Research Data approved this project (Project No: 619754).

Analyses and data management

Context-mechanism-outcome configurations are the unit of analysis in realist evaluations and serve to help develop programme theories. A standard procedure in realist evaluations is to use the data iteratively, allowing the researcher to unpack the context-mechanism-outcome elements and refine and continue to develop the programme theory [35, 42]. The procedures are thus neither deductive nor inductive. Instead, they are abductive with a retroductive approach – continually asking why and how service outcomes arise and gaining new insights accordingly [43, 44]. We first followed a direct content analysis approach described by Hsieh and Shannon [45], followed by a re-examination of the analysis using the context-mechanism-outcome heuristic as an analytical framework [34]. Data from the interviews and documents were analysed with the support of the qualitative software program NVivo [46].

Each context-mechanism-outcome configuration is depicted in separate tables below and are directly drawn from the analyses (Tables 3–5). The context-mechanism-outcome configurations function as building blocks for developing and refining the programme theories. Quotes are anonymous, although non-identifying data on the interviewee's professional background is added to enhance credibility [45]. The quotes have been translated from Norwegian into English by the first author, then back-translated from English to Norwegian by an independent party to ensure their meaning holds up under translation.

RESULTS

Our analyses from the service deliverers' perspective led to three context-mechanism-outcome configurations describing dental practitioners' role change, from one with focusing only on oral pathologies to one including treatment of dental anxiety. These have been juxtaposed, revealing the contrast between contexts [47]. Overall, our findings describe how dental practitioners need time and support institutionally to match their communication needs and grade the exposure therapy, reducing the patients' dental anxiety.

Programme Theory One: Time leads to trust

The first context-mechanism-outcomeconfiguration is that time with the patient leads to a trusting relationship between the dental practitioner and patient, allowing exposure therapy to commence (Table 3).

Stakeholders from a dental background reflect on dentistry being a traditionally performance led practice. Services are often measured in terms of completing as many patients as possible in as little time as possible. Whereas regular dental practitioners are used to restoring multiple teeth within a couple of hours, dental practitioners in the TADA service report spending up to several hours just 'getting the patient into the dental chair.'

Stakeholders in the interviews believed that a patient's experience of trauma or suffering from dental phobia reduced their ability to trust the dentist. To establish trust, dental practitioners needed to give patients time to understand that neither the exposure therapy, nor the dental practitioner, would harm them. By introducing time as a resource into the institutional context, dental practitioners have the space to practice active listening, display patience and be flexible – allowing trust to emerge.

Stakeholders thus believe that the TADA environment should stand apart from the requirements and pressures of traditional dental environments and performance-led measures. If time is provided and trust built, then patients' exposure therapy can begin (short term outcome), and relief from dental anxiety can be achieved (long term outcome).

> Your job, using behavioural therapy, becomes so much easier if you have a good relationship because then it's so much easier to get the patients to step into it … If you have established a base relationship … where the patients feel that: 'okay, I trust her if she says this will be okay – then I can try'. Then we are so much faster at work. I think the relationship is super important. (Dental practitioner)

> You have those patients where relational problems [are] at the core. They might have been subjected to abuse or violence or … have a lot of chaos and clutter and fail to care for themselves

TABLE 2 TADA service documents

No	Title (translated into English):	Author/Year	Document type	Description
1	Practitioners Handbook	Myran L, Johnsen IB, Årøen Lie JP 2019	Handbook	This handbook provides details on how practitioners should meet and work with the contextual patient group. Details regarding the aetiology of anxiety, symptoms of dental phobia, cognitive behavioural therapy and ways of communicating to enhance relationship-building are elaborated.
2	Practitioners Guidance	2018	Guidelines on the operating practice	This guidance leaflet describes some potential service routes for the patient, resources (such as templates for anxiety treatment), inclusion and exclusion criteria for patients and overall aspects to consider for practitioners (such as collegial support and collaborating with others).
3	Treatment contract and TADA info	N/A	Service aid	The treatment contract supports joint relationships and collaborative work to restore the patient's oral health.
4	Treatment plan	N/A	Service aid	The treatment plan is a template and a plan for each session and describes small and large goals for the patient to achieve throughout the service pathway.
5	Coping plan	N/A	Service aid	This coping plan is jointly filled out by the patient and the TADA dental practitioner. The coping plan aims to aid in the dental restoration phase – making the patient and the follow-up dental practitioner aware of their triggers, stop signs and needs for adjustment.
6	Patient handbook	2019	Guidebook	Patients receive a handbook describing the aim and outline of the service. The handbook includes details on anxiety and traumas and their effects on the dental setting.
7	White paper 35: accessibility, expertise and social equality for the future's dental health service	2006–2007	Policy paper	Describes the government's objective to create and offer equal health care services – regardless of diagnosis, place of residence, personal finances, gender, ethnic background and the individual's life situation.
8	Facilitated dental health services for people who have been subjected to torture, abuse or odontophobia	The Norwegian Directorate of Health, October 2010	Report	The first report developed before TADA teams were established. This report describes the different aspects of the patients and offers a rationale for why they need facilitated dental treatment or therapy.
9	Job description Dentist/Dental Hygienist	N/A	Role description	The job description describes the expected tasks the dental practitioner should execute.
10	Job description Dental Assistant	N/A	Role description	The job description describes the expected tasks the dental assistant should execute.
11	Job description Psychologist	N/A	Role description	The job description describes the expected tasks the psychologist should execute.
12	TADA survey	N/A	Survey	This is a survey conducted by a private dentist (not a TADA service practitioner), collecting thoughts from other (mostly private) practitioners regarding the service. Thirty statements are reported – all expressing negative concerns about the workings of the service.
13	Overall reporting on the TADA service	The Norwegian Directorate of Health, 2016, 2017, 2018, 2019	Report	Yearly reporting revealing data on the types of patients enrolled in the service, waiting lists, total number of TADA teams within each county and the service's economic aspects.

TABLE 3 Analyses of context-mechanisms-outcome configuration (CMOC) for developing Programme Theory One

	Context +	Resource →	Reasoning =	Outcome
CMOC 1	The institutional context does not place pressure on the dental practitioners and is considerate regarding this patients' anxiety levels hindering a speedy process, and the time it may take for patients to build trust towards the dental practitioners.	By providing the resource of time	Time allows the dental practitioners the space to engage in active listening, display patience and flexibility	Immediate outcome: with trust in place, the dentist can commence exposure therapy. Service outcome: the dental practitioner alleviates the patient's dental anxiety, who is then ready for dental restoration.
Juxtaposed CMOC 1	The institutional context reflect time as a tool to measure performance and place pressure on the dental practitioners.	Time is not provided as a resource; instead, it is used as a tool to measure work performance	Then the dental practitioner will feel rushed, and will not have time to establish a trusting relationship with the patient	Immediate outcome: the patient experiences an anxiety response. Service outcome: a lower likelihood of the patient finishing the exposure therapy

TABLE 4 Analyses of context-mechanisms-outcome configuration (CMOC) for developing Programme Theory Two

	Context +	Resource →	Reasoning =	Outcome
CMOC 2	The context mirrors an institutional setting and interpersonal relationship between psychologists and dental practitioners, supporting the knowledge transfer and collaboration between psychologists and dental practitioners through service resources and placing them within proximity.	Resource required is a close collaboration between dentist and psychologist, so dentists learn strategies for communicating and displaying sensitivity. Additional supplements are tangible resources (such as pamphlets) that provide examples of how to communicate with different patients and of how desensitisation within exposure treatment works.	With these resources, it is believed that the dental practitioner facilitates a safe space. A safe space reflects sensitivity, predictability, and control.	Immediate outcome: the dental practitioner can effectively introduce and provoke the patient with the fear-provoking stimuli. Service outcome: alleviated dental anxiety.
Juxtaposed CMOC 2	The contexts lack interpersonal relationships between key actors; thus, the dental practitioner has not learnt how to display sensitivity or match their communication level with the patient.	Dental practitioners are not collaborating with the psychologist, and there is a lack of tangible resources explaining to the dentist different ways to communicate.	The dental practitioner thus cannot facilitate a safe space; the patient will perceive the exposure therapy as threatening.	Immediate outcome: anxiety responses are activated in the patient and the dental practitioner will be unable to commence exposure therapy. Service outcome: the dental practitioner will not be able to alleviate the patient's dental anxiety.

TABLE 5 Analyses of context-mechanisms-outcome configuration (CMOC) for developing Programme Theory Three

	Context +	Resource →	Reasoning =	Outcome
CMOC 3	The institutional setting reflects a supportive environment and a good ethos for learning the additional skills needed for the psychological intervention. Also, the interpersonal relationship between psychologists and dental practitioners is accommodating and welcoming, allowing dental practitioners to build a repertoire on how to grade the pace of exposure to bespeak the individual's need.	Resources that allow dental practitioners to regulate the pace of exposure involve courses where they discuss challenges and procedures with psychologists; secondments to other clinics and oral health centres, focusing on dental anxiety; and experience. These resources provide a repertoire of how to regulate pace during the exposure.	If the dental practitioner can speed up or slow down the exposure, they become confident in their role as a therapist and match the pace of exposure to patients' tolerance levels.	Immediate outcome: the dental practitioner delivers the exposure therapy, which matches the patient's tolerance level. In cases where the patient is challenged outside of their tolerance window, the dental practitioner can bring them back to a tolerable level. Service outcome: alleviated anxiety.
Juxtaposed CMOC 3	The context is affected by performance-led measures, which hinders dental practitioners to develop interpersonal skills.	There is a lack of resources that support skill development in dental practitioners in exposure therapy and no development programmes, secondments or training.	Dental practitioners are unable to match the pace of exposure therapy to the needs of the patient.	Immediate outcome: The pace of exposure therapy does not match the patient's therapeutic window. Service outcome: drop out, or no change in anxiety responses.

> … [They have] basic trust issues really … confidence issues … They don't have anyone around them to trust. (Psychologist)

> [It] takes a very long time before they trust that the dentist really wishes them well. And then we sort of have to start a slow adjustment, … we constantly need to check that they are with us and that they are not dissociating or just struggling their way through it. (Psychologist).

Programme Theory Two: Matching communication styles

The second context-mechanism-outcome configuration is that matching their communication style to that of the patient, allows the dental practitioner to develop a safe space.

Stakeholder interviews and service documents describe how TADA patients' level of comprehension – when it comes to their understanding of their dental fear responses and treatment procedures – varies greatly. Some patients will require a thorough description of the drill: what it does, why and how, while others may not. Patients also vary in their need to discuss their reactions before exposure. Exposure therapy is a branch within CBT, and patients learning about the tools and procedures used in dental treatment is part of this treatment process. Service documents outlining treatment procedures note that the patient's comprehension of the process is an essential step (Table 4).

The stakeholders interviewed noted that the dental practitioners must display sensitivity and match their communication style to that preferred by the patient and ensure that the patient has comprehended the exposure procedures involved. By being sensitive to the patient, the dental practitioner can pick up on the individual patient's needs and reactions to the information. Stakeholders with a psychological background describe this sensitivity as normative within psychological interventions. They believed that close collaboration with the psychologist could allow dental practitioners to cultivate this sensitivity. Stakeholders with a background in dentistry suggest that this collaboration be supplemented with other tangible resources (e.g., pamphlets), which can be provided to patients. These documents should describe the steps to be taken in the treatment, how each exposure session affects a patient's anxiety levels, and how to cope with this (Table 4).

In a context where dental practitioners display sensitivity and vary their communication methods and style to match each patient's background, they facilitate a safe space. When the communication matches a patient's needs and reflects sensitivity, the stakeholders assume that the dental practitioner will establish a safe space and foster predictable treatment

paths. Establishing a safe space is believed to ameliorate the desensitisation process, contributing to the successful treatment of anxiety.

> Some [patients] are razor-sharp, incredibly resourceful. [They] take this cognitive behavioural therapy with a straight-arm. … I can't talk to them in the same way as someone who is resource-poor and has a lot of anxiety problems, and little schooling and don't, don't understand the rationale behind what we do … and it's so exciting that we have to adapt it like that! (Dental Practitioner)

> 'Why do you use a drill like that, and why do you use it, why does it make such a sound, why does it feel like that on the tooth' – yes … lots of things people don't know and, therefore, have made up some explanation for this. Then it is important to remember that it is likely that TADA patients will have had experiences that have made them scared. They have avoided [dental examinations] for many years, and only sought care for acute cases, when it is a complete crisis with inflammation and caries to the pulp … and in those cases, they haven't experienced a 'normal" dental treatment'. (Dental Practitioner)

Programme Theory Three: A graded pace facilitates gradual and successful exposure

The third context-mechanism-outcome configuration is that if a dental practitioner takes a graded pace to therapy, this facilitates a gradual and successful exposure to dental care.

Stakeholder interviews and service documents describe the high degree of anxiety the patients experience when under care. This is a consequence of suffering from a dental phobia or traumas and inhibits their ability to accept treatment procedures. Stakeholders from dental backgrounds explain how patients may dissociate or experience a panic attack while being exposed to the drill. The service document (no. 2, Table 2) describes patient dissociation as a survival instinct, an anxiety response where patients mentally detach themselves from the current dental experience and their immediate surroundings to deal with the feeling of pain. Stakeholder interviews, however, describe these anxiety responses as severe and unwanted as they are exhausting for both the patient and the dental practitioner. To avoid these severe anxiety responses, dental practitioners must regulate the pace of the exposure to match patients' tolerance levels. By regulating the pace to match patients' tolerance levels, patients can manage their responses while being gradually challenged by increasing levels of exposure. This leads to gradual desensitisation, habituation to, and acceptance of, the feared stimuli (Table 5).

The stakeholders interviewed described the dental practitioners' ability to regulate the pace of treatment as one of the critical resources required in the service. They regulate it by working within the 'therapeutic window'. The 'therapeutic window', referred to in service documents and by stakeholders, is a term widely used within anxiety treatment to describe the degree of arousal in the patient's nervous system that is tolerable for them and allows them to receive the exposure therapy efficiently. The stakeholders explain that if the pace is too fast, the patient goes out of this therapeutic window and 'you lose them'. Once outside their window of tolerance, the patient is driven to one of four biological reactions to the perceived danger: fight, flight, freeze, or faint. None of these responses is desirable.

Nevertheless, learning how to regulate the pace of treatment so that it matches the patient's therapeutic window is not something dental practitioners learn in dental school. Thus, the TADA service offers courses for dental practitioners to learn the skillset of providing and adjusting the pace to match the patient's tolerance. Stakeholders with dentistry backgrounds also described learning by doing or through experience. They noted that such experience taught dental practitioners to practice vigilance, tune in to patient reactions, and adjust the pace accordingly.

Stakeholders believed that matching the pace to the patient's response levels led to the patient being desensitised to the fear-causing stimuli.

> …those [patients] exposed to abuse, and especially those with a severe abuse experience,… very easily just sort of zoom out. They just opt-out. They roll down the curtains, and then they just persevere.… You can't just continue with the exposure therapy, because they won't get it. Then, it is so much more to work on: work on being present, work on being able to withstand something happening …. You can't run it [the exposure treatment] in the same way for someone who easily dissociates, as with someone who is completely cognitive, capable and realises that this is just anxiety. (Dental Practitioner)

> When we are in the tolerance window, we can think clearly and learn new things. Then we are aware of our feelings and endure them quite well. We may feel both stressed, angry and sorry, but not in a way that activates our survival reactions. (No. 2, Table 2).

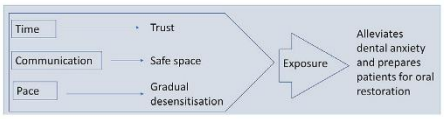

FIGURE 1 TADA context: providing the patients with time, matching their communication level, and grading the pace of exposure reduce dental anxiety

DISCUSSION

Our initial program theory described an assumption in the TADA service that the patients suffering dental phobia or trauma can have their anxiety alleviated through exposure therapy [38]. Despite the advantages of employing dental practitioners in exposure therapy [2], this requires a role change. Our findings revealed that dental practitioners must deviate from detecting and treating oral pathologies to attending to psychological needs. How, and in what circumstances, dental practitioners can adopt this role change is summarised in Figure 1.

Our analyses (Figure 1) revealed first that, for dental practitioners to adopt this role change, the institutional context must facilitate practitioners' having ample time for their consultations with the patient. Participants also believed that dental practitioners needed to develop their individual capacity to match patients' communication styles and adapt the pace of exposure therapy to the particular needs of the individual patient. In sum, the dental practitioners asserted that this fostered trust, a safe space, and gradual exposure are required to address the particular individual needs of the TADA service patients.

Skaret and Soevdsnes [48] explain that trust between practitioner and patient is essential to commence therapy and to receive its benefits from a therapeutic perspective. Fostering a trusting relationship between dental practitioners and patients is supported in studies exploring what trauma survivors or patients with high dental anxiety require from dental practitioners [12, 31, 48]. Our study shows this to be particularly the case for patients with a high degree of dental fear for whom facilitating trust and reflecting an atmosphere of patience affects their perception of the dental encounter and positive rating of the service. However, as previously noted, time is traditionally described as a performance measurement within the dental context (e.g., a target number of patients treated per week). Such performance-led measures for cost-effective procedures are typical in New Public Management and the pay for performance system, and some view them as attractive within dentistry also [49–51]. However, we argue that the services for patients with trauma and phobia, such as TADA, should provide extra time as a resource for attending to patients' psychological needs. This suggests that a performance-led environment, where there is a focus on getting target numbers of patients treated per set time period, can prevent dental practitioners from delivering effective exposure therapy. On the contrary, if more time per patient is provided as a resource for dental practitioners to display patience, practice flexibility and actively listen to patients' needs, our participants believed this would foster trust between them and the patient.

Parallel to cultivating trust between patient and dental practitioner, our second programme theory describes facilitating a safe space as fundamental for successfully alleviating dental anxiety. This is a space in which the dental practitioner has created a predictable environment that allows the patient to gain a stronger sense of control. A previous study investigating dentistry consultation models found that creating predictability and establishing a safe space affected the therapeutic alliance, which likely positively influences practitioner–patient collaboration and interaction [52]. A safe space is also considered essential to facilitating dental attendance for abuse survivors and children with dental anxiety [12, 53]. Building on this knowledge – demonstrated in numerous studies – of how essential it is to create a safe space, the realist evaluation approach has allowed us to unpack which resources enable TADA dental practitioners to facilitate this safe space. As seen in our second programme theory, a dental practitioner facilitates a safe space by matching their communication style with the patient's comprehension levels and displaying sensitivity. Dental practitioners learn how to communicate and display sensitivity through close collaboration with a psychologist and by applying tangible resources (e.g., pamphlets explaining exposure procedures). This means the setting in which the service is implemented needs to be supportive of resources (such as pamphlets) and promote an interpersonal relationship between the psychologist and dental practitioner, allowing these new skills to develop. Their skills of displaying sensitivity and adapting a communication style require dental practitioners to embrace what Rosing *et al.* [54] describe as a 'change of focus from the clinical to the relational'.

Our last programme theory describes how dental practitioners facilitate gradual exposure for TADA patients. Exposure therapy works on the assumption that, with a direct and active approach, the patients will develop new responses to the feared stimuli and will learn that their catastrophic thoughts were just that: thoughts [7]. A drill is a tool that may trigger an anxiety response due to its appearance, sound, and sensation [16]. A catastrophic thought related to the drill, for instance, could be that it will drill a hole through the entire tooth. Challenging this thought, operationally, means that the patient may permit the dental practitioner to place the drill in the patient's mouth for 10 s in the first session. This time of exposure may then be slowly increased, in subsequent sessions.

However, it is vital that a patient's tolerance is not tested so much that they are lost outside their therapeutic tolerance window, where they cannot mentally return to the session.

This places potential pressure on the dental practitioner performing the exposure task because they must regulate the pace of the exposure correctly, matching this to each patient's particular needs and allowing for a gradual desensitisation process to occur. However, if the pace of exposure did not match patients' needs and dental practitioners did 'lose' the patients, psychologists, with whom dental practitioners had formed close interpersonal relationships, were close at hand. As noted, the term 'therapeutic window' is borrowed from anxiety treatment and refers to arousal level. It is the gap between a state of under- and over-arousal that interferes with an efficient delivery of therapy [55]. For dental practitioners to adopt and work within this window, we argue that there is a need for training and education beyond what dental schools currently teach. Norwegian dental schools currently offer a few behavioural subjects as electives. Yet, as our third programme theory reflects, additional resources to evaluate the challenges of exposure activities, and acquire explicit knowledge of how to work collaboratively and interprofessionally with psychologists, are needed. When reflecting on their experience of regulating exposure, our stakeholders often portrayed this as tacit knowledge, which allowed them to tune into the patient [56]. This tacit knowledge was acquired through 'learning by doing' and with the support of an attending psychologist [57]. Training that involves the growth and transfer of explicit knowledge in this area would supplement dental practitioners' tacit knowledge (experience). Harnessing both knowledge types is valuable for dental practitioners to regulate patients' exposure pace correctly.

Although we have provided new insight into a role change required by dental practitioners, our study has some limitations. The findings provided by this study are drawn from informants who participated in both developing and delivering TADA. It is conceivable that, naturally, their perspectives may be biased and present an overly positive view of the success of the service. Further, when interviews are guided by theories, stakeholders may try to agree with and to please the interviewer, providing socially desirable information that either satisfies societal norms on the treatment of vulnerable groups or alternatively complies with any research hypothesis the researcher brings tentatively to the interview for testing [45]. Questions raised in the interviews also required stakeholders to recall events, and this recall of past events may be flawed. Measures aimed at overcoming these biases were to collect data from multiple sources (documents and interviews), with multiple stakeholders from various background (psychology and dentistry) providing an interdisciplinary perspective. We also focussed the interviews on the processes at play and underplayed the fact that the study was an evaluation of the service in a traditional sense. It was emphasised that this study centred on refining an initial programme theory on how the services works and for whom [34]. Finally, the interviewer kept a reflexive journal, auditing the process and decision making, and examining any biases that may have arisen during the data collection [45, 58]. Finally, the theories of the service developers/deliverers expressed here now require further testing with other stakeholder groups, including patients' perspectives, which is part of an ongoing phase of the current realist evaluation cycle of which this study was part.

In conclusion, our thick descriptions, building on qualitative data and a realist methodology, have allowed us to explore how – and under which circumstances – dental practitioners manage a new role of alleviating dental anxiety for patients with a history of trauma or dental phobia. In examining the dentist's new role in such a service in the Norwegian context (TADA), we find that practitioners believe their role is to build trust and a safe space for their patients and be setting an appropriate pace for their gradual desensitisation. To achieve this, dental practitioners require the specific resources of time, communication skills/tools to achieve this. Dentistry is, however a profession that focuses on the technicalities of restoring oral pathologies rather than on assessing and treating psychological needs. For dental practitioners to deliver exposure therapy, they are required to work outside their traditional professional domain. It is thus suggested that dentists be better supported to expand their professional domain. Policymakers should consider increasing the psychological content and the interprofessional nature of both dental training and the daily work of practitioners interacting with patients with trauma or dental phobia.

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CONFLICTS OF INTEREST

The Oral Health Centre of Expertise Rogaland, Norway, encompasses a TADA team.

AUTHOR CONTRIBUTIONS

Conceptualisation: Emilie Bryne, Sarah Hean, Kjersti Evensen, Vibeke Bull; **Methodology**: Emilie Bryne, Sarah Hean; **Validation**: Emilie Bryne, Kjersti Evensen; **Formal Analysis and Investigation**: Emilie Bryne; **Data Curation**: Emilie Bryne, Sarah Hean, Kjersti Evensen, Vibeke Bull; **Writing – Original Draft**: Emilie Bryne. **Writing – Review and Editing**: Emilie Bryne, Sarah Hean, Kjersti Evensen, Vibeke Bull; **Visualisation**: Emilie Bryne; **Supervision**: Sarah Hean, Kjersti Evensen, Vibeke Bull.

ORCID

Emilie Bryne https://orcid.org/0000-0001-9533-1862
Sarah Hean https://orcid.org/0000-0003-2759-0461
Kjersti Evensen https://orcid.org/0000-0002-2384-2265
Vibeke Bull https://orcid.org/0000-0003-1572-9243

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Seeing the person before the teeth: A realist evaluation of a dental anxiety service in Norway

Emilie Bryne[1,2] | **Sarah Catherine Patricia Duff Hean**[2] | **Kjersti Berge Evensen**[1] | **Vibeke Hervik Bull**[1]

[1]Oral Health Centre of Expertise, Stavanger, Rogaland, Norway

[2]Faculty of Social Sciences at the University of Stavanger, Stavanger, Norway

Correspondence
Emilie Bryne, Oral Health Centre of Expertise, Torgveien 21 B, 4016 Stavanger, Norway.
Email: emilie.bryne@throg.no

Funding information
Oral Health Centre of Expertise, Rogaland, Norway

Abstract

Patients with a trauma history, whether sexual abuse or torture, or dental phobia, tend to avoid dental services due to severe dental anxiety. Subsequently, they experience poor oral health, lower quality of life, and poorer general health. In Norway, a specific service (torture, abuse, and dental anxiety ['TADA]) targets these patients' dental anxiety through cognitive behavioural therapy (CBT) prior to dental restoration. By exploring patients' experiences with TADA services using a realist evaluation approach, this paper aims to increase our understanding of how this type of service addresses patients' dental anxiety in terms of its mechanisms and contextual factors. Interviews with TADA patients ($n = 15$) were analysed through a template analysis driven by context-mechanism-outcome heuristics. The analysis revealed that patients value a dental practitioner who provides a calm and holistic approach, positive judgements and predictability elements that lean towards a person-centred care approach. Provided this, patients felt understood and cared for, their shame was reduced, self-esteem emerged, and control was gained, which led to alleviation of dental anxiety. Therefore, our findings suggest that combining CBT with a person-centred care approach helps alleviate patients' dental anxiety. This provides insights into how dental services could be executed for these patients.

KEYWORDS

abuse, cognitive behavioural therapy, dental phobia, person-centred care, torture

INTRODUCTION

Many patients with a history of trauma or dental phobia struggle with attending routine dental examinations [1–4]. One contributing factor is that the dental setting reminds patients of their trauma setting [5,6]. This could be attributed to the dental examination being an invasive procedure that may include the administration of sharp objects into the mouth, being horizontally lowered, being alone in a room with a person of authority, the smell of the dental medication and the anticipation or experience of pain or judgement [4,5]. These elements can trigger a physiological fight, flight, freeze, or faint response [4–8], with patients' experiencing a sudden, overwhelming, and uncontrollable sensation of losing control and feeling threatened. This could result in patients losing their trust in the dental practitioner and the setting, which ultimately could lead to avoidance behaviour [9–15]. Avoiding dental services could be problematic because it could lead to deteriorated oral health and increased oral pain from infections, which would require more extensive and complex

treatment procedures [16–19]. The patient can then enter a recurring cycle of avoidance, dental neglect, enhanced awareness, and embarrassment over unmet needs and reduced psychosocial life and can eventually reinforce their initial dental fear and anxiety [20].

Cognitive behavioural therapy (CBT) may be one way to break the cycle of avoidance behaviour. CBT is a widely studied therapeutic approach initially intended to treat depression [21,22], but some dentists also use it in their practice as an evidence-based method to treat dental anxiety [16,23]. Previous research involving dental practitioners who have used CBT on patients with dental phobia has shown a significant lower dental anxiety score, better dental service attendance and decreased decayed teeth counts after a 1-year follow-up [24–26]. A review by Wide Boman *et al.* [27] concluded that CBT is a promising therapy and often a therapy of choice for the treatment of patients with dental anxiety or phobias. A cognitive behavioural therapist assumes that the patient's cognition and thinking are disrupted, thus affecting dysfunctional emotion and behaviour [21]. In CBT, the goal is to unpack cognitive elements, such as thoughts, mental images, self-talk, and core beliefs and subsequently alter them [21,22]. Therefore, CBT may vary depending on the disorder or diagnostic symptoms displayed by the patient. For patients with dental anxiety disorders, CBT involves unpacking and testing patients' catastrophic misinterpretations of the anxiety-provoking setting or stimuli [14,16]. This begins with the therapist gradually exposing the patient to feared objects or stimuli in the dental setting in a controlled fashion [14]. The therapist helps the patient through this process by setting the goals and tasks needed to achieve the dental treatment required. This process will be unique to the individual patient depending on their potential trauma background, anxiety triggers, and personal preferences, but the therapy centres on a hierarchical technique that habituates the patient towards the fear stimuli [14,16].

Existing research has focused on assessing the efficacy of CBT outcomes for patients with dental phobia or anxiety [24–26]. However, less is known about the underlying mechanisms that explain why CBT is efficacious and which contextual elements trigger these mechanisms that lead to an outcome of either a successful or unsuccessful alleviation of dental anxiety. To address this knowledge gap, we take an in-depth approach to explore patients' experiences of an exemplar CBT service offered to phobic patients in a dental service in Norway, where dental practitioners themselves delivered the CBT. This study explores specifically *why (mechanisms) and under which circumstances (context) patients with a history of trauma or dental phobia who have undergone CBT as part of a specific service (torture, abuse, and dental anxiety [TADA]) experience alleviation of their dental anxiety*. In this way, our study contributes to the understanding of how dental practitioners deliver their services, particularly how using CBT alongside standard dental procedures may enhance this.

Testing the theory of how the TADA service functions

In Norway, the TADA service was developed to address avoidance behaviour by catering to both patients' anxiety and their oral health. The service first treats dental anxiety through CBT. When dental practitioners administer CBT, they do so as part of a collaborative and interprofessional team that includes psychologists. *Dental practitioner* is an umbrella term covering dentists, dental hygienists, and dental assistants. The division of labour is such that the dental practitioners administer the CBT through sessions of in-vivo exposure therapy, and the psychologists assess patient service eligibility, oversee the dental practitioners' delivery of CBT, and are in proximity to assist in the CBT intervention if needed [28,29]. Patient eligibility for the service is assessed on criteria either outlined for dental phobia in the *Diagnostic and Statistical Manual IV* or in the patient's reported history of abuse or torture.

This paper explores patients' experiences with CBT, as offered by the TADA service, by testing a theory of how the TADA service functions, as proposed by service deliverers and developers [28,29]. This theory proposes that, from a professional perspective, the TADA service, through its bidimensional approach to providing dental anxiety treatment and dental restoration, works largely to reach a population that has otherwise been found to avoid dental services. As it is free of charge, the service is easy to access and, hence, meets individual needs. This is key to its functionality. From the deliverers' perspective, the service tailors CBT to meet individual needs, and the dental practitioners adopted roles that enabled them to build patients' trust, facilitate a safe space, and thereby grade the desensitisation regarding patients' fear triggers. Adopting these roles requires dental practitioners to work in an institutional setting that provides sufficient time and additional skills, thus enhancing their interpersonal development and allowing them to adopt an appropriate communication style and therapeutic pace for each patient.

These findings [28,29] reflect how developers and deliverers theorise the workings of the service; however, they were not informed by the recipients' perspectives. The key to building on this understanding of the mechanisms that lead to 'alleviated dental anxiety' is to now include the patient's perspective [30]. According to Pawson and Tilley [30], different stakeholders are expected to have different knowledge about the service. Through service participation, patients are expected to be more sensitised to the mechanisms that lead to the outcome of 'alleviated dental anxiety' and can thus provide us with data on which resources lead to the change at the individual level. Therefore, this paper sought

to refine this initial theorisation of the TADA service (a so-called programme theory in realist terminology) [28,29] by examining, comparing and contrasting this view of service developers and deliverers with the perspective of the TADA patients themselves. Researching this could provide insights into how dental practitioners could execute dental anxiety services for patients with dental phobia or a history of torture or abuse.

MATERIAL AND METHODS

A realist evaluation approach offers a methodology to uncover the mechanisms and contexts at play [30]. It does so by theorising *what works for whom and under what circumstances, how and why* before collecting data to inform this initial theory [30]. By asking what is working *for whom* and *in what circumstances*, the realist approach identifies contextual elements. The philosophical underpinning of a realist evaluation assumes that specific contexts trigger a working mechanism, which answers *how and why* a service is working. Furthermore, it assumes that, when a context triggers a mechanism, this leads to an outcome that identifies *what* is working. By assuming that a context triggers a mechanism that leads to an outcome, this also implies that context, mechanisms and outcomes work as a contingency. Through this way of thinking, Pawson and Tilley [30] proposed that, in order to gain insight into the causal inferences of why something works and for whom and under which circumstances, the contextual factors, the mechanisms these trigger and the permutations in which these combine to achieve particular outcomes should be explored. The realist evaluation literature hence presents the formula of *context + mechanisms = outcomes* [30]. This formula has been subsequently modified by mechanisms being divided into the dyad of *resources and reasonings* [30,31]. Reasonings refer to the explanations that people provide at a cognitive level for why they behave differently within a programme/service. Resources are those factors introduced into the context that then enable them to alter their reasoning. Thus, in realist evaluation language, the refined formula used in our analysis is represented by the following: *resource + context → reasoning = outcome* [30,31].

The realist approach is a theory-driven methodology and assumes that services are theory incarnate [30]. Therefore, the research steps involve identifying and formulating an initial programme theory, often set by service developers, which acts as a working hypothesis to be tested, often with service users. This initial programme theory navigates sampling and the method choices for data collection. This also means that, to fully understand how the TADA service works, for whom and under which circumstances, the realist approach allows us to build on the perspective of the service deliverers by comparing these with those put forward by the patients themselves.

The ontological assumption within realist evaluations is that mechanisms are often hidden and are thus difficult to measure through quantitative data method procedures [30,32]. Therefore, a qualitative method was employed in the current study that consisted of in-depth semi-structured interviews with patients to explore their perspectives on why and under which circumstances CBT led to the outcome of 'alleviated dental anxiety'. This choice of method allowed us to gain rich and descriptive data on the contexts and mechanisms, thus informing our initial programme theory.

Interviews

As outlined in the initial programme theory, this study defined *alleviated dental anxiety* as the central outcome of the service. Therefore, the patients were purposively recruited based on having reached this outcome. In practical terms, this involved recruiting all patients within a specific region in Norway who had finished the CBT phase of the service. These patients were transitioning to the oral restoration team for continued oral treatment. Thus, the TADA service assessed them as having their anxiety alleviated [28].

This paper refers to all the patients enrolled in the TADA service generically as 'TADA patients.' We acknowledge that TADA patients are heterogeneous but consider their commonality as central: they all fear procedures related to the dental encounter and examination.

Data collection occurred from the end of December 2020 to the start of June 2021. Fifteen informants were recruited, and interviews were carried out by the lead author. The interviews were individual, as opposed to focus groups, based on the assumption that sensitive themes could emerge and group interviews could restrict information gathering.

An in-depth semi-structured interview guide consisting of six broad questions was formulated. Patients were asked about (1) their experience receiving CBT; (2) how their dental anxiety progressed, what led them to reach out to the TADA team and how this evolved into a treatment plan as part of the service pathway; (3) their experience during and post treatment, focusing on the positives and challenges and how they overcame challenges; (4) if and how treatment affected other areas of their life; (5) if and how the service could be different; and (6) their expectations and feelings on entering the dental restoration phase.

Causal follow-up questions, such as 'how did trust affect the treatment pathway,' naturally arose and allowed the interviewer to better understand the themes that informed our initial programme theories. These predefined themes were time, communication, and pace (as contexts) and trust, safe space, and graded desensitisation (as mechanisms) and became naturally embedded as follow-up questions for questions 1–3. Therefore, the interview style took a middle ground between a

bottom-up and top-down approach that allowed the researcher to explore the existing themes already defined through the broader open-ended questions presented in the paragraph above [33]. This technique allowed the possibility of new and emerging themes while limiting key concepts to the perspective of study and the initial programme theory.

Analyses and data management

The duration of interviews averaged 42 min, with a maximum length of 81 min and a minimum of 22 min. Interviews were transcribed verbatim directly afterwards, and analyses ran concurrently with the data collection. A template analysis, including context-mechanism-outcome heuristics, was used to inform the initial programme theory [30,32,33]. The template analysis, proposed by King [33], is an iterative and flexible analytical process that encourages a focus on where the richest data lie. Therefore, it is an appropriate tool for applying a context-mechanism-outcome lens to focus on aspects of the data that are relevant to our research aims and can inform the initial programme theory developed in the early phases of the evaluation. The first analytical step was to become familiar with the collected data material and better understand the programme theory by reading interview transcripts. Second, preliminary codes, a priori themes, were outlined from our initial programme theory developed from interviews with professionals in the service. These thematic codes were identified as time, communication, and pace, which were placed under contexts, and trust, safe space, and graded desensitisation, which were placed under mechanisms [29].

These themes worked as an initial coding template for the ongoing analyses, which was modified about halfway through the analyses, as the initial template was deemed inadequate for representing the patient's perspective. For transparency, the modification of the template is depicted in Figure 1. Modifying the template is part of the iterative process and is typical of both template analyses and realist evaluations [32,33]. The modified template included themes of 'a calm and holistic approach,' 'a positive judgement' and 'predictability,' hierarchically structured under 'dental resources.' These showed causal links to themes placed under 'patient reasonings,' including 'being cared for,' 'regaining their self-esteem and devaluing shame' and 'control.' These led to the outcome of 'finishing CBT and alleviating dental anxiety.' Thus, this modified template revealed the causal chain between context-mechanism-outcomes by having mechanisms split into dyads consisting of resources and reasonings, and the template was thus applied to the entire data set. After applying it to the entire data set, the template's wording was altered to 'if…then' statements, which, for the theory-building process, further clarified which resources led to a change in the patient's reasoning. Realist evaluations often apply 'if…then' statements to evaluate casual links or as a translation between context-mechanism-outcome configurations, as they enhance the understanding of the interconnection between the themes and minimise the probability of simply cataloguing themes [30,34–37].

Trustworthiness

The researcher kept a journal throughout the research process to reflect on background, subjectivity, and the potential impact on the data being collected and the analysis [38,39]. Throughout the interviews, the researcher repeatedly paraphrased the information given by the participants to ensure that the interviewer and interviewee understood each other. The initial analysis by the first author was discussed and adjusted accordingly by the entire research team to establish the confirmability of our findings [40]. Quotes and the analytical procedure, as depicted in Figure 1, of the context-mechanism-outcome configurations have been added as part of the reporting strategy to gain credibility.

Lastly, the trustworthiness of the data interpretation could have been influenced by the previous data collection due to a defined initial programme theory. Nonetheless, from a realist perspective, Pawson and Tilley [30] suggested that this be a notion of perspectivism rather than a barrier to trustworthiness. As Pawson and Tilley [30] argued, an advantage of including multiple perspectives for refinement, such as those of deliverers from the initial programme theory and those of patients, is that validity is promoted, as the programme theories reflect various views from the actors involved. There are limitations to single perspectives; yet by accumulating these perspectives, the research can also inform the various views on why something works within specific services. Therefore, moving away from the perspective of whether something is working or not, one is moving toward a perspective that recognises the multiple perspectives and the human activity involved in whether interventions and services are successful.

Ethical approval

The Norwegian Regional Ethics Committee (Project No: 134932) and the Norwegian National Centre of Research Data approved this project (Project No: 619754) and the study protocol. Patients were recruited after finishing their dental anxiety treatment; thus, assessed as *finalised* by the TADA service. The interview guide was explained beforehand to avoid potential participation implications, and psychological follow-up by the TADA team was made available for the patients. None of the patients accepted this offer. Also, at the start of the interview, patients were encouraged to steer the conversation

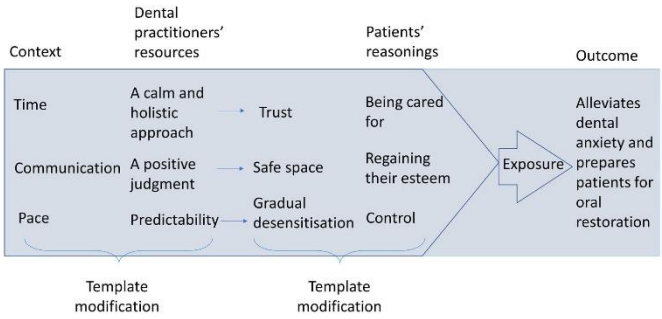

FIGURE 1 This figure represents how our a priori codes informed our context-mechanism-outcome configurations and followed a template modification. The text above the blue box refers to the realist context-mechanism-outcome heuristic tool used in the analyses, and the text below refers to which themes were modified to include the patient perspective in our programme theories

based on what they felt comfortable sharing and to discontinue whenever they would like.

RESULTS

Eight males and seven females participated in this study. Seven participants had additional trauma histories resulting from either torture or abuse. Nine participants struggled with additional mental health challenges, such as posttraumatic depression, depression, and general anxiety. The period since the last dental visit varied; two had visited within the previous 2 years, seven within 2–5 years, two within 5–10 years, three within 15–20 years, and one between 20 and 25 years ago.

In our description of the findings, we present a summary of the theories formulated by the patients in terms of a resources, context, reasoning, and outcome configuration shown in Table 1. These configurations are then followed by detailed descriptions of each refined theory presented under separate headings. The configurations in Table 1 serve as building blocks for programme theories that originated from the service developers' perspectives, which can also be traced back to Figure 1. Figure 1 depicts the contextual themes and a priori codes from the analysis—'time,' 'communication,' and 'pace'—which were modified to 'a calm and holistic approach,' 'a positive judgement,' and 'predictability' that fit under resources provided by the dental practitioners. Moreover, the a priori codes of 'trust,' 'safe space,' and 'gradual desensitisation' were modified under the patient's reasoning of 'being cared for,' 'regaining their self-esteem,' and 'control.' The context, dyad of resources and reasoning, and outcome are labelled above the blue box in Figure 1 to indicate the realist heuristic tool used for analytical purposes. Building on Figure 1, we developed Figure 2 to enhance our retroductive theory-building process and depict what patients described as dental practitioners' resources that led to their change of reasoning. The text in the yellow boxes in Figure 2 first refers to the resources provided by the dental practitioner following the patients' change of reasoning through the realist 'if…then' statements.

Programme Theory 1: A holistic and calm approach taken by the dentist leads patients to feel understood and cared for

The TADA patients unanimously explained that their dental anxiety was linked to the perception of dental practitioners as being rushed and seeing patients merely as objects and a source of income. They explained it as a 'honk and drive' setting that did not give dentists time to listen to their needs or build a practitioner–patient relationship. Thus, the patients were inclined to feel vulnerable and insecure about the anxiety responses that could arise in the dental setting.

The patients believed that the TADA setting deviated from this norm of general dental services. The institutional setting of the TADA service provides dental practitioners with more time, allowing them to build a trusting relationship with the patient through active listening and portraying sensitivity. This affected the patients' view of the TADA dental setting, as their previous negative perception of the dental setting and practitioner was challenged. By being met by a practitioner who portrayed sensitivity towards their needs and actively listened to them, patients felt cared for and as if they met with understanding.

Patients thus agreed with the theory initially presented by the dental workers, but they expanded on this theory to suggest that they perceived the TADA dental practitioner as calm

TABLE 1 Context-mechanism-outcome configurations building the programme theories

Dental practitioners' resource (Mechanism)	Context	Patients' reasoning (Mechanism)	Outcome
A holistic and calm approach	The patients generally fear dental practitioners and the tools involved in the dental setting and perceive the dental scenario and practitioners as rushed and incentivised by money, which overshadows their needs. The TADA setting deviates from this, as an institutional contextual layer to the service is time.	Patients' reasoning changes towards the setting; they feel understood and cared for in the TADA setting because they are met differently than envisioned, as they are treated with a holistic and calm approach.	Feeling understood cared for in a setting they feared allowed them to finish the dental anxiety treatment, which has alleviated their dental anxiety.
A positive judgement	TADA patients' avoidance behaviour and related shame hinder them in upholding a routine in dental examinations. The institutional TADA setting facilitates dental practitioners in developing interpersonal skills so that their communication becomes a tool to generate a safe space and provide patients with a positive judgement.	Patients ' shame is reduced by positively judging their oral status, and they start regaining their self-esteem.	Regaining their esteem and reducing their shame has led to their approval of the service, which allowed them to continue and finish the dental anxiety treatment, which has alleviated their dental anxiety.
Predictability	CBT involves confronting feared objects/stimuli, which can trigger a fear response from the patients. In a context where the pace is matched with the patient's anxiety level, gradual desensitisation occurs.	Patients gain control because they become prepared and informed about exposure activities, length of activities, and stop signs during the session.	Being in control of the exposure sessions led to finishing the dental anxiety treatment, which has alleviated their dental anxiety.

Abbreviations: CBT, cognitive behavioural therapy; TADA, torture, abuse and dental anxiety.

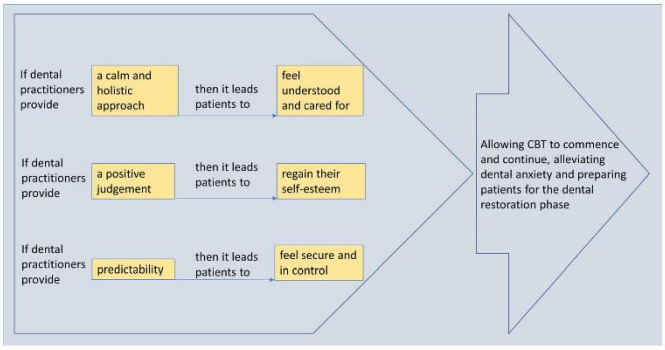

FIGURE 2 Converted template to include 'if…then' statements identifying how resources led to altered reasoning affecting the outcome of 'alleviated dental anxiety.' This illustrates the causal pathway between which resources led to which change of reasoning for the patients. The resources paired with the reasonings make up a dyad explaining the mechanisms involved that led to the outcome

and holistic because, by understanding that their needs extend beyond the mouth, the dental practitioner saw the patient as a whole person. As Figure 2 depicts, this calm and holistic approach in a setting that had previously been associated with anxiety, insecurity and vulnerability allowed patients to feel understood and cared for. This was mentioned as a critical ingredient for the treatment pathway to both commence and continue, and this alleviated their anxiety. One patient noted,

> 'I was met with understanding, even though I sat there crying my eyes out' (Female, trauma, 2–5 years since last dental visit).

Other patients had similar experiences:

> I wouldn't be here if she hadn't been a good dentist. But it depends on, what should I say, their personality, how they accept patients, how they treat you like a human being. (Male, dental phobia, 2–5 years since last dental visit)

> Some dentists just get you down in the chair and open your mouth and say, 'That's the problem', fix it, and go out […] But if you have others who see you as a human being […] see your needs – what are you struggling with, also take that into account. (Male, dental phobia, 2–5 years since last dental visit)

Programme Theory 2: Feeling that the dentist viewed them positively in the dental setting reduced patients' feelings of shame and helped them regain their self-esteem

TADA patients expressed feeling vigilant and self-conscious regarding their oral status. Some patients said that, before the TADA treatment, they avoided social contact, covered their mouth from partners and avoided smiling to hide their oral status. Patients described their shame and fear of 'revealing the mouth' and said this nurtured their avoidance behaviour, and some had avoided dental services for decades. For these patients, high maintenance, including a vigorous toothbrushing regime, was described as a strategy to continue their avoidance behaviour and maintain specific control over their oral status. Patients with fewer years since their last dental visit explained that they had sought dental care for acute cases and pain relief. In these cases, the treatment procedures were often complex and painful, confirming the patient's fear of the dental setting.

Patients explained that it had taken much courage to seek help from the TADA service to change their avoidance behaviour, manage their anxiety and have their oral needs met due to their severe anxiety and shame associated with dental settings. The mere fact that the service addresses both psychological and dental needs played a role in service enrolment and following through with the service pathway. Following through with the service pathway was helped by the positive judgement that patients received from the dental practitioners.

Patient interviews elaborated on the dental practitioners' initial programme theory, revealing that the institutional context of TADA facilitated dental practitioners in building a repertoire of communication skills that would provide a safe space for patients. Patients acknowledged the TADA dental practitioners' skills in reducing the patients' feelings of shame by providing them with a positive judgement of their oral status. Examples given by patients included remarks made by the dental practitioners, such as 'I've seen worse' or 'This was not as bad as you explained it.' As illustrated in Figure 2, providing patients with a positive judgement towards their oral status reduced their shame and enhanced their self-esteem because they felt accepted. Patients described this as life-changing and said that it motivated them to continue the treatment pathway and alleviated their anxiety:

> 'We've got it; we've seen it all,' she [the dental practitioner] says to me, so it doesn't matter. (Female, trauma, 15–20 years since last dental visit)

> […] the shame of not daring to go to the dentist because your teeth are broken and that things are not good. Just dining out and having to hide in the toilets with the toothpicks. So, it certainly has been a big life change for me – starting and doing this [the TADA treatment]. (Female, trauma, 15–20 years since last dental visit)

Programme Theory 3: The predictability of the TADA sessions leads patients to feel a sense of control in this feared situation

Patients described a fear of losing control or experiencing anxiety responses, such as panic attacks, dissociating or fainting during exposure sessions. In the original programme theory, service deliverers explained the need to grade the CBT and match patients' tolerance levels to avoid these anxiety responses.

Patients elaborated on this and included predictability as a necessary resource from the dental practitioners in the context. As exemplified in Figure 2, when dental practitioners provided patients with a predictable service, patients explained that they regained control, which diminished their fear and associated anxiety.

Patients explained that establishing predictability occurred both before and during the session. Establishing predictability

during the session entailed dental practitioners reminding patients of their treatment plan, the exact length of time of the exposure and confrontation (e.g., 15 s with the oral injection needle inside the mouth) and their agreed stop sign for ending or pausing the session.

Predictability before the session varied for patients. The majority (all but one) expressed the importance of an introduction session held before the CBT began. In this session, patients are given information about the upcoming CBT sessions and the nature of the exposure activities that will soon commence. However, one patient, a female with a trauma background comorbid with other mental health challenges, deviated from this. This patient explained that knowing about the exposure activities before the CBT sessions began would only accelerate her fear and result in her cancelling the session. Thus, for this specific patient, it was essential to establish predictability of exposure activities only at the onset of the CBT sessions instead of at the induction phase.

In either case, patients expressed that, when dental practitioners established predictability, it allowed them to gain control in this setting, as one patient noted

> 'because you have 100% confidence in what is happening, which has allowed you to tune in to it, and a 100% specific thing to dread, as opposed to dreading a sea of things, and that certainty.' (Male, dental phobia, 15–20 years since dental visit)

One stated:

> 'Being aware of what's going to happen today, that was important. It calmed me down a lot. More than just being put in a chair and not knowing anything.' (Male, dental phobia, 2–5 years since last dental visit)

Patients described that, by having control in a setting that they previously feared, they now felt able to continue the treatment pathway and have their anxiety alleviated:

> They make it so that you don't worry unnecessarily about a treatment that you might think is getting worse and more serious than it actually will, because you know everything is predictable. (Male, dental phobia, 15–20 years since dental visit)

DISCUSSION

In this study, patients with dental phobia or trauma history identified essential resources for them in the TADA therapeutic setting. Patients reported that their dental anxiety was alleviated because dental practitioners provided them with a calm and holistic approach, positive judgements and predictability. When dental practitioners provided these resources within the therapeutic context, patients reported feeling more controlled in the setting. They felt cared for and understood, their shame was reduced, and they gained self-esteem. This led to patients' commencing and continuing the CBT, alleviation of their dental anxiety, and preparing for their dental restoration. The causal pathway between dental practitioners' resources and patients' reasonings is illustrated in Figure 2. One of these resources, and the first identified in our context-mechanism-outcome configurations, uncovered that patients' dental anxiety was alleviated in the TADA setting because patients felt that the dental practitioners provided a calm and holistic approach that made them feel understood and cared for. Research on vulnerable patients' perceptions of care services has shown that a feeling of being understood and cared for is vital for keeping dignity, easing suffering, and contributing to clinical decision-making [41–43]. Furthermore, research has found that creating interpersonal relationships can affect treatment outcomes, suggesting that the practitioner–patient relationship goes beyond the type of treatment provided [44].

A further resource was identified by patients, as outlined in our second context-mechanism-outcome configuration: patients felt that practitioners provided a positive judgement that reduced their feelings of shame and led them to regain their self-esteem. Research has shown that patients with dental anxiety tend to score low in self-esteem, often resulting in avoidance of social activities and relationships due to shame about their dental appearance [45,46]. Reducing feelings of shame and thereby enhancing self-esteem means there is potential for improving patients' well-being [6].

The last resource noted by patients, which was identified in the final context-mechanism-outcome configuration, shows that patients felt that dental anxiety was alleviated in the TADA setting because dental practitioners provided them with predictability, which led them to gain control. Control in this setting refers to the ability to affect the outcomes in the situation, potentially avoiding or limiting adverse events within the given scenario. Previous research has also identified control as a mechanism that affects dental anxiety [3,47], and research on control within the psychology field has suggested that control promotes coping with stressors [48,49]. Our findings contribute to existing research, as our analyses display specifically how the dental practitioners provided predictability – allowing patients to gain control. This involved reminding the patients of the treatment plan, activities' duration and the agreed-upon stop signs that would end or pause the session. Thompson [49] described this type of predictability as informational, as it allows patients to gain control because they become prepared and informed about how to affect the potential adversity of outcomes.

The patients' emphasis on *how* the dental practitioners delivered the therapy rather than the specific components or strategies of the CBT itself is interesting and surprising, as the focus of the training for dental practitioners in the TADA service was to deliver CBT. We, therefore, argue that the three identified resources give rise to a more person-centred care approach [50,51], which adds complexity to the therapeutic CBT interventions. The person-centred care approach, which branches from humanistic psychology, is defined as 'providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions' [52]. A person-centred care approach deviates from CBT in that it is less focused on the instrumental tools for altering the cognition and habituation towards fear stimuli [14]. Instead, the person-centred care approach focuses on the patient's ways of becoming an active agent, thus creating a positive atmosphere where patients are met with respect, empathy and understanding and are actively listened to Mills *et al.* (2013) [53]. Hence, when dental practitioners explore the patient's perspective, it allows them to build a practitioner–patient relationship and see the patient holistically.

The findings from this study add to our findings from the first phase of the TADA evaluation [29], where our initial theory described *pace*, *time* and *communication* as important aspects of the service's success, as seen from the service deliverers' perspective. By testing this initial theory after the patients have received the service, we uncovered the specific *ingredients* of the active mechanisms, namely, which resources were essential for reaching the service's end goal of alleviating their dental anxiety. Thus, a major strength of this study is its perspective on evaluating the TADA service based on the patients' experiences. This has provided us with valuable insight and a detailed description of what they found important in reaching the outcome of 'alleviated dental anxiety' rather than a clinical measurement outcome.

A notable limitation in this study is that the patients participating in this study were likely to be highly motivated, as they had ended their avoidance behaviour, sought contact and finished the service treatment pathway. Furthermore, our ethical decision to only interview patients who had finished the service pathway also brought about the limitation of collecting data from patients for whom the service has been a success. This means that, while we better understand what works for whom and under which circumstances, we have less of an idea of what does *not* work for whom under which circumstances.

Our findings hold implications for how dental services can be structured to deliver therapeutic interventions. Scambler and Asimakopoulou [50] proposed a model of how to incorporate patient-centred care within dentistry that consists of foundational components that involve (1) exploring how the patient's disease affects the patient, (2) seeing the patient as a whole, (3) providing ethos that is compassionate and empathetic, and (4) reaching a mutual agreement on treatment goals. Our results support this model from a patient perspective and suggest that this model could be effective for vulnerable patients with dental anxiety. Therefore, we suggest that dental services should implement a person-centred care approach as part of CBT when designing future services for patients with a history of trauma or dental phobia. This is further supported by research elsewhere showing that a person-centred care approach increases patient satisfaction, reduces service utilisation, and becomes more efficient in terms of time spent during consultations, thus proving to be cost-saving [54–57].

In conclusion, while dentistry traditionally is seen as a profession that focuses on technical procedures, an approach in which the practitioner sees the patient before the teeth is valuable for vulnerable groups. As depicted in Figure 2, our findings describe that, if dental practitioners provide vulnerable patients with a calm and holistic approach, a positive judgement and predictability, these patients will feel understood and cared for, regain their self-esteem, and feel secure and in control. The patients identified this as leading to their outcome of 'alleviated dental anxiety.' The findings build on our initial programme theory set by the TADA service deliverers that indicate pace, time and communication as important aspects in alleviating anxiety for this patient group [29] yet uncovered specific resources provided by the dental practitioner that lean more towards a person-centred care approach. These findings also suggest that the dental practitioner approach can mediate therapeutic outcomes. However, it remains unclear how a person-centred care approach and CBT complement each other in the clinical setting. Future research is required to explore dental practitioners' views on the impact of CBT training. It should explore whether CBT training, as reported in our study by the patients themselves, does indeed expand the dentists' vision beyond just the patient's mouth and whether, from the dentists' perspective, time, and the removal of performance-based measurement impact the dentists' perspective on the patient–practitioner therapeutic relationship.

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CONFLICTS OF INTEREST

Units of the TADA service are located at the Oral Health Centre of Expertise, Rogaland, Norway.

AUTHOR CONTRIBUTIONS

Conceptualisation: Emilie Bryne, Sarah Hean, Kjersti Berge Evensen, Vibeke Hervik Bull; **Methodology**: Emilie Bryne, Sarah Hean; **Validation**: Emilie Bryne, Kjersti Evensen; **Formal Analysis** and **Investigation**: Emilie Bryne; **Data Curation**: Emilie Bryne, Sarah Hean, Kjersti Berge Evensen, Vibeke Hervik Bull; **Writing – Original Draft**: Emilie Bryne; **Writing – Review & Editing**: Emilie Bryne, Sarah Hean, Kjersti Berge Evensen, Vibeke Hervik Bull; **Visualisation**: Emilie Bryne; **Supervision**: Sarah Hean, Kjersti Berge Evensen, Vibeke Hervik Bull.

ORCID

Emilie Bryne https://orcid.org/0000-0001-9533-1862
Sarah Catherine Patricia Duff Hean https://orcid.org/0000-0003-2759-0461
Kjersti Berge Evensen https://orcid.org/0000-0002-2384-2265
Vibeke Hervik Bull https://orcid.org/0000-0003-1572-9243

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Appendix 1.

Interview Schedule with service developers and deliverers

English version (translated from Norwegian). This interview schedule evolved as interviews progressed, thus, not all participants were asked the full length of the interview guide.

	Question	**Guiding sub-questions**	**Reasoning**
1.	Can you describe your role in the TADA service?		Introduction questions and exploring the programme strategy
2.	How would you describe the TADA service?	How does it facilitate the dental treatment? When is CBT performed? What is the difference between facilitating dental treatment and delivering CBT?	Exploring the service structure and context
3.	What would you say is the main intention of the TADA service?	How is the service structured to meet this intention?	Exploring the outcomes
4.	As the service stands now, it is free of charge for its patient group, how do you think this affects the service as a whole and its patient population?		Exploring subsidy as a context, looking for mechanisms or outcomes
5.	What is your perception of the patients when they first enter the service?	According to documents, they are in a "difficult life circumstances", can you elaborate on this? Has the increased scope of treatment needs affected the exposure therapy?	Exploring the patient heterogeneity as part of the context
6.	According to documents, their dental needs are		Exploring the context of patients' needs.

	severe. What is your perception of this?		
7.	CBT is described as the preferred method. From your perspective, can you describe why CBT should work?	What is the essence of CBT for this patient population? Is there something else that generates the positive outcome the patients are reporting back on?	Exploring the logic behind CBT, looking for mechanisms
8.	From your perspective, how are the patients when they are sent to county dental clinics?	How does this affect the close relationship between the patient and the TADA teams?	Exploring the service architecture, looking for outcomes
9.	Do you keep in touch with the patients?	How is this contact established and kept?	Exploring the service architecture, looking for context
10.	How is it decided and who decides when the patient is "finalised"?	Some teams describe this at the dental practitioner's role, is that the same, nationally? How are the dental practitioners equipped to determine this?	Exploring the context for finalising patients and exploring the service outcome of 'finalised patients'
11.	How do you experience the:	Communication, within the TADA teams? Across teams? How is it with the Directorate of Health? Collaboration, within TADA teams? Across teams? How is it with the Directorate of Health?	Exploring the service architecture and looking for mechanisms
12.	Which resources are made available?	For communicating across teams and towards the Directorate of Health? Internet page/ facebook groups? The treatment plan used for therapy sessions? Additional tools?	Exploring mechanisms

13. Within your TADA team, are you closely connected?	To the psychologist? To regional resources such as specialised teams with anaesthetic treatment?	Exploring mechanisms
14. Would you say the TADA service reaches its overall goal?		Exploring outcomes
15. What challenges do you meet in your daily practice?	Do you experience any challenges related to patient criteria's or categorisations, as outlined in the documents? Some TADA teams mention the dental practitioners could be doubtful regarding the longevity of exposure therapy, what is your take on this?	Exploring outcomes - focus on unintended or unsuccessful ones
16. Is there something you wish I asked about?		Closure question

Ethical Clearances

Følgende vurdering er gitt:

BAKGRUNN

NSD har vurdert endringen registrert 12.08.2020. Et nytt utvalg, pasienter, er inkludert i studien. Denne vurderingen erstatter den forrige.

Prosjektet er vurdert og godkjent av Regionale komiteer for medisinsk og helsefaglig forskningsetikk (REK) etter helseforskningsloven (hfl.) § 10 (REK sin ref: 134932).

Det er NSDs vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet den 10.08.2020 med vedlegg, samt i meldingsdialogen mellom innmelder og NSD. Behandlingen kan starte.

MELD VESENTLIGE ENDRINGER

Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til NSD ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke type endringer det er nødvendig å melde: nsd.no/personvernombud/meld_prosjekt/meld_endringer.html

Du må vente på svar fra NSD før endringen gjennomføres.

TYPE OPPLYSNINGER OG VARIGHET

Prosjektet vil behandle særlige kategorier av personopplysninger om helse og alminnelige kategorier av personopplysninger frem til 30.12.2023. Etter prosjektslutt vil koblingsnøkkel oppbevares i inntil fem år for kontrollhensyn. Deretter skal kodenøkkelen slettes og datamaterialet slettes eller anonymiseres.

LOVLIG GRUNNLAG

Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 nr. 11 og art. 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse, som kan dokumenteres, og som den registrerte kan trekke tilbake.

Lovlig grunnlag for behandlingen vil dermed være den registrertes uttrykkelige samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a, jf. art. 9 nr. 2 bokstav a, jf. personopplysningsloven § 10, jf. § 9 (2).

PERSONVERNPRINSIPPER

NSD vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen om:

- lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke viderebehandles til nye uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER

Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: åpenhet (art. 12), informasjon (art. 13), innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18), underretning (art. 19), dataportabilitet (art. 20).

NSD vurderer at informasjonen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

FØLG DIN INSTITUSJONS RETNINGSLINJER

NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og eventuelt rådføre dere med behandlingsansvarlig institusjon.

OPPFØLGING AV PROSJEKTET

NSD vil følge opp underveis (hvert annet år) og ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet/pågår i tråd med den behandlingen som er dokumentert.

Lykke til med prosjektet!

Kontaktperson hos NSD: Karin Lillevold

Tlf. Personverntjenester: 55 58 21 17 (tast 1)

REK

Region:	Saksbehandler:	Telefon:	Vår dato:	Vår referanse:
REK vest	Camilla Gjerstad		02.11.2020	134932
			Deres referanse:	

Kjersti Berge Evensen

134932 En evalueringsstudie av TOO-tilbudet

Forskningsansvarlig: Tannhelsetjenestens kompetansesenter Vest / Rogaland

Søker: Kjersti Berge Evensen

REKs vurdering

Vi viser til søknad om prosjektendring mottatt 13.10.20 og din tilbakemelding 29.10.20 angående ovennevnte forskningsprosjekt. Søknaden er behandlet av REK vest ved komiteleder på delegert fullmakt fra komiteen, med hjemmel i forskningsetikkforskriften § 7, første ledd, tredje punktum. Søknaden er vurdert med hjemmel i helseforskningsloven § 11.

Prosjektendring
Det søkes om endring i prosjektperioden der ny prosjektstart vil være 02.11.2020, og ny prosjektslutt vil være 30.06.2021. En annen endring er at intervjuene vil skje i et annet forløp enn i opprinnelig beskrevet. Studien vil nå starte datainnsamlingen før avslutningssamtalen i TOO-forløpet. Dermed vil deltakerne bli ivaretatt i teamet som de får oppfølging av. Søker peker på at med denne endringen blir det ikke behov for et utvidet, isolert psykologkontakt som beskrevet i den opprinnelige forskningsprotokollen. Måten datainnsamlingen nå vil bli lagt opp på er at pasientene vil ha jevnlig kontakt med psykolog i teamet sitt i noe tid etter intervjuet.

Hovedbegrunnelsen for endringen er corona. Slik situasjonen er nå vil prosjektets datainnsamlingsperiode bli forsinket.

REK vest ba om tilbakemelding (29.10.20)
Det ble i opprinnelig søknad søkt om prosjektslutt 31.12.2023. Studien er forsinket, men det søkes likevel om en kortere prosjektperiode der ny prosjektslutt er 30.06.2021. Er det korrekt?

Tilbakemelding fra prosjektleder
Søker skriver: *Vedrørende siste endringsmelding er det oppført en feil. Beklager for dette. Vurderingen dere gir baserer seg på uklare endringsmeldinger, og dette skyldes en enkel skrivefeil. Skrivefeilen gjelder ordet «prosjektslutt», hvor det egentlig skal stå slutt for datainnsamling. Det vil si, prosjektet vil ha samme prosjektslutt. Endringsmeldingen søker om en forlengelse for datainnsamlingsperioden. Denne datainnsamlingsperioden er 30.06.2021.*

REK vest
Besøksadresse: Armauer Hansens Hus, nordre fløy, 2. etasje, Haukelandsveien 28, Bergen
| E-post: rek-vest@nih.no
Web: https://helsenorden.no

Vurdering av tilbakemeldingen
REK vest ved komiteleder har vurdert tilbakemeldingen og har ingen ytterligere merknader til de omsøkte endringene. Godkjent prosjektslutt er forsatt 31.12.2023. Alle analyser og publisering må være gjort innen prosjektslutt.

Vedtak

Godkjent

REK vest godkjenner prosjektendringen, med hjemmel i helseforskningsloven § 11.

Med vennlig hilsen

Marit Gramning
Professor dr.med.
komiteleder REK vest

Camilla Gjerstad
rådgiver

Klagerådgang
Du kan klage på komiteens vedtak, jf. forvaltningsloven § 28 flg. Klagen sendes til REK vest. Klagefristen er tre uker fra du mottar dette brevet. Dersom vedtaket opprettholdes av REK vest, sendes klagen videre til Den nasjonale forskningsetiske komité for medisin og helsefag (NEM) for endelig vurdering.