Oral health challenges in refugees subjected to torture

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My mind can travel anywhere

Across the ocean, across dry land
Past, present, and future
No traffic lights or mind the gap
No one can stop me moving

My eyes can see the un-seeable
My ears can hear the un-hearable
My hands can touch the invisible

I think non-stop

More bad, less good
Fear, flashback, scared, hopeless
Stressful
Sometimes I see no future
More sadness
Loneliness
Insecurity

That is my immigrant mind

"My brain is an immigrant" by Senait Hagose

Contents

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Abbreviations

CBT	Cognitive Behavior Therapy
CIDT	Cruel, Inhuman or Degrading Treatment
DMFT	Decayed, Missing or Filled Teeth
DT	Number of Decayed Teeth
HTQ	Harvard Trauma Questionnaire
MDAS	Modified Dental Anxiety Scale
OHRQoL	Oral Health-Related Quality of Life
OIDP	Oral Impacts on Daily Performances
PTE	Potentially Traumatic Experiences
PTS	Posttraumatic Stress
PTSD	Posttraumatic Stress Disorder
TADA	Torture, Abuse and Dental Anxiety
TIC	Trauma Informed Care

1. Introduction

"Everyone has the right to life, liberty and security of person", states the UN's Universal Declaration of Human Rights (UN General Assembly, 1948). These are basic human rights that every state is committed to provide to people who are deprived of livelihoods and protection in their home countries.

All the 171 countries (OHCHR, 2021) that have ratified the United Nations' Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (UN, 1984), and thereby support the total ban against torture, are obligated to provide rehabilitative care to victims of torture. Health professionals need to be aware of both the health perspective and the legal perspective (Overland *et al*., 2014), but to this date, Norway does not have a uniform system to ensure rehabilitation, although excellent work is reported in individual cases (Dinardi *et al.,* 2021; Lønning *et al*., 2021; RVTS, 2014).

> TORTURE is defined as "…any act by which severe pain or suffering, whether physical or mental, is intentionally inflicted on a person for such purposes as obtaining from him or a third person information or a confession, punishing him for an act he or a third person has committed or is suspected of having committed, or intimidating or coercing him or a third person, or for any reason based on discrimination of any kind, when such pain or suffering is inflicted by or at the instigation of or with the consent or acquiescence of a public official or other person acting in an official capacity. It does not include pain or suffering arising only from, inherent in or incidental to lawful sanctions."
>
> (UN Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment, 1984)

From the definition, it follows that torture is intentional, and not coincidental. It is inflicted for a purpose, such as forcing information or merely to break down the victim physically and mentally.

Despite the comprehensive work against torture,

> *(performed by organizations such as Amnesty International, Association for the Prevention of Torture, Atlas of Torture, Committee Against Torture (CAT – OHCHR), DIGNITY, Freedom from Torture, Human Rights First, Human Rights Watch, International Crisis Group, International Rehabilitation Council for Torture Victims (IRCT), Physicians for Human Rights, REDRESS, Reprieve, Solitary Watch, World Organization Against Torture (OMCT), among others)*

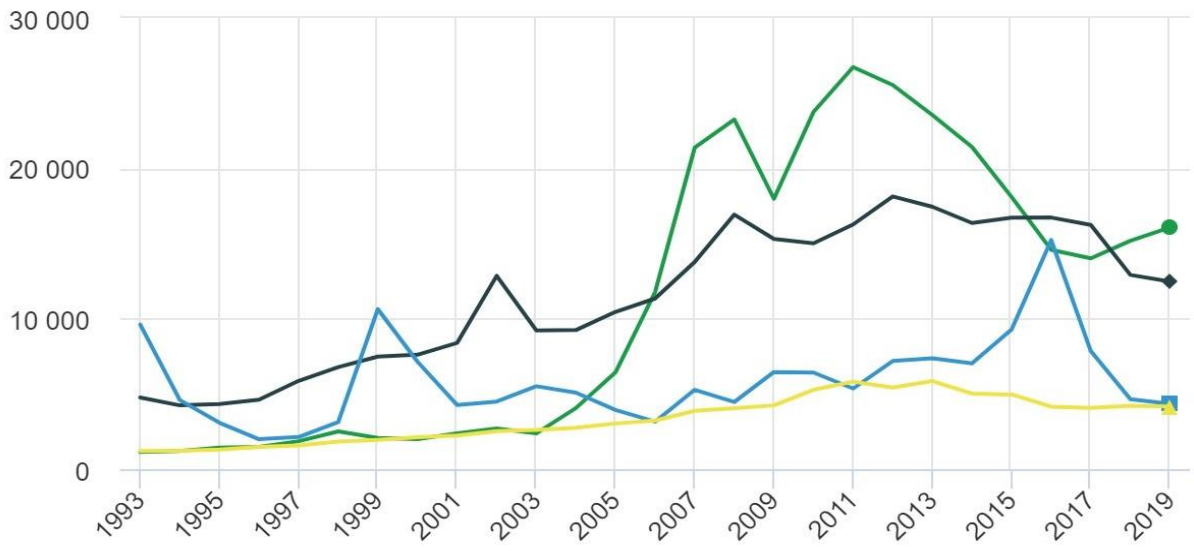
torture is still practiced in all parts of the world, in no less than 141 countries. Torture is common in all conflicts where people are forced to seek refuge. Therefore, although torture victims may be found in other groups, such as war veterans and correspondents, a high proportion of torture survivors are refugees or asylum seekers (Amnesty, 2021).

Over the last decade, Europe has experienced a marked increase of refugees, and after the refugee crisis in 2015, the Nordic countries received a large number of asylum seekers, both compared to other European countries and relative to their population numbers (Karlsdóttir *et al.,* 2018). Figure 1 shows numbers of refugees to Norway over the last two decades compared to other reasons for immigration. As of May 2020, individuals with refugee background accounted for 4.4 percent of the Norwegian population (238 281 persons) (SSB befolkning, 2020).

> REFUGEE is defined as "someone who is unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion".
>
> (UN, 1951)

> Still, whether or not a person who has fled is granted status as a refugee, is defined either by the UNHCR as RESETTLEMENT REFUGEES / QUOTA REFUGEES, or by the country where refuge is sought. An individual whose claim for protection in a country has not yet been decided on, is defined as an ASYLUM SEEKER.
>
> (UNHCR, 2006)

Figure 1 Reasons for immigration to Norway[1]:



[1]SSB, innvandringsgrunn, 2020

The oral cavity is a sensitive part of the body, which makes it a frequent target for practitioners of torture (Lif-Bimer, 1998; Singh *et al.,* 2008). However, as research on general treatment of torture victims is scarce compared to research on other trauma (Dibaj *et al.,* 2020), it is not surprising that research on torture and oral health is limited. Thus, oral health challenges are often overlooked in the rehabilitation of torture survivors. At the world-leading Danish Institute against Torture (DIGNITY), psychologists and physicians work closely with physical therapists and social workers, but there are no dentists employed. A Dignity physician revealed:

> *"At a consultation last week, for some reason I came to ask the patient whether he had some oral complaints. I was overwhelmed by his answer. It became clear that his long-term headache was actually caused by a dental infection. I asked why he hadn't mentioned this before. He said he hadn't bothered to, since at that time he could not afford going to the dentist anyway".* (Personal communication)

The New York University College of Dentistry (NYUCD) founded a program for survivors of torture in the mid-nineties, providing medical care, mental health care and social- and legal

services. Early on they discovered the large need for dental care in this group, and for a few years the NYUCD and the Bellevue NYU collaborated on a dental program for torture survivors (Keller *et al.,* 2014). However, updated literature review indicates that Norway is the only country that offers a nationwide, free of charge, oral health service (TADA) targeting torture exposed individuals, in addition to victims of sexual abuse and individuals with dental phobia (Norwegian Directorate of Health, 2010). Nevertheless, to date very few torture survivors, only about 20 a year, have been referred to or sought out the service (Lønning *et al.,* 2021, Norwegian Directorate of Health, 2021). Suggested explanations are that the services is not well enough communicated to this targeted group, in addition to high dental anxiety, transportation challenges and long waiting lists (Norwegian Directorate of Health, 2021). Long waiting lists was also reported in an Australian study as a barrier for refugees, including torture victims, to enroll in available dental services, as well as lack of interpreter services (Davidson *et al.,* 2007).

The knowledge about oral health challenges faced by torture survivors, and how to facilitate dental treatment to this vulnerable population, is limited, and largely based on studies where the research groups for the most part were torture victims who had made contact themselves due to oral health problems (Bøjholm, 1995; Bølling, 1978; Jerlang, 1992; Jerlang *et al.,* 1995; Keller *et al.,* 2014; Lif-Bimer, 1998; Singh *et al.,* 2008). This phenomenon is not limited to oral health-studies. A review of the literature on torture rehabilitation, concluded that research on torture and its sequelae historically have been conducted in refugee clinics or other treatment settings (Quiroga & Jaranson, 2005).

2. Background

2.1 Torture survivors in Norway

The Norwegian Red Cross suggest that there are currently between 10 000 and 35 000 torture survivors residing in Norway (Norwegian Red Cross, 2020). Exact numbers are not possible to estimate, due to both the lack of systematic identification and documentation of torture victims in Norway (Lønning *et al.,* 2021), and the great reported variance in torture prevalence among refugees across studies (Rabin & Willard, 2014; Steel *et al*. 2009). In a comprehensive literature review administered by the Swedish Red Cross, the median of reported torture experiences was 27%, whereas the reported percentage ranged from 1% to 76%. Torture prevalence were higher in men and in older age groups (Sigvardsdotter *et al.,*

2016). Excluding gender and age, the differences in reported proportion of torture exposure are largely explained as depending on the extent of collective violence and history of political activism in the society of origin, and how the studies are conducted (Jakobsen *et al.,* 2007; Norwegian Red Cross, 2020; Quiroga & Jaranson, 2005). For instance, a large number of studies solely involve torture victims who have sought out treatment on their own initiative or have been referred based on need for rehabilitation.

The identification of torture victims is complicated by the victims' compromised ability to trust and confide in others, as well as uncertainty among professionals regarding how to ask the questions, and whether they are willing to listen to the answers (Quiroga & Jaranson, 2005; Norwegian Red Cross, 2020). However, the high rate of granted asylum applications (76% in 2020) speaks for itself about the severity of the applicants' experiences (UDI statistics, 2020). Table 1 shows refugees to Norway in 2020 by country of origin – countries which are all known to practice torture (Amnesty, 2021).

Table 1 Refugees to Norway in 2020 by country of origin (UDI latest, 2020; UDI statistics, 2020)

Country of origin	Granted asylum (n)	Quota refugees (n**)**
Syria	418	800
Congo and South Sudan (retrieved from Uganda)		750
Various nationalities evacuated from Libya		500
South Sudan, Sudan, Eritrea, and Yemen (retrieved from Ethiopia)		350
Congo (retrieved from Rwanda)		300
Turkey	291	
South Sudan, Somalia, and Congo (retrieved from Kenya)		150
Eritrea	134	
Afghanistan	50	
Others (less than 50 from one country)	248	150
TOTAL	**1141**	**3000**

2.2 Torture and its consequences

Insomuch as torture is targeting to inflict harm, and to break down and disempower the victim, the consequences of torture are both physical and psychological.

Pain, which is often long-lasting and localized to multiple parts of the body, is considered the most prominent sequelae in torture survivors. However, despite a considerable overlap, the psychological aftereffects often turn out more persistent and protracted than the physical consequences (Moisander & Edston, 2003; Quiroga & Jaranson, 2005).

In a recent study of torture survivors residing in Italy, medico-legal experts found physical evidence in only 58% of cases. Common methods of torture that leave no visible scares are waterboarding, suspension, blunt instrument beating, deprivation techniques (food, light, sleep, medical treatment, oral hygiene, etc.), forced labor, violent interrogation, and death threats. The authors also claim that torture methods were more related to the cause of the torture (political, religious, ethnic, economical, forced labor) than to country of origin or transit (Ilenia *et al.,* 2021).

2.2.1 Psychological consequences of torture

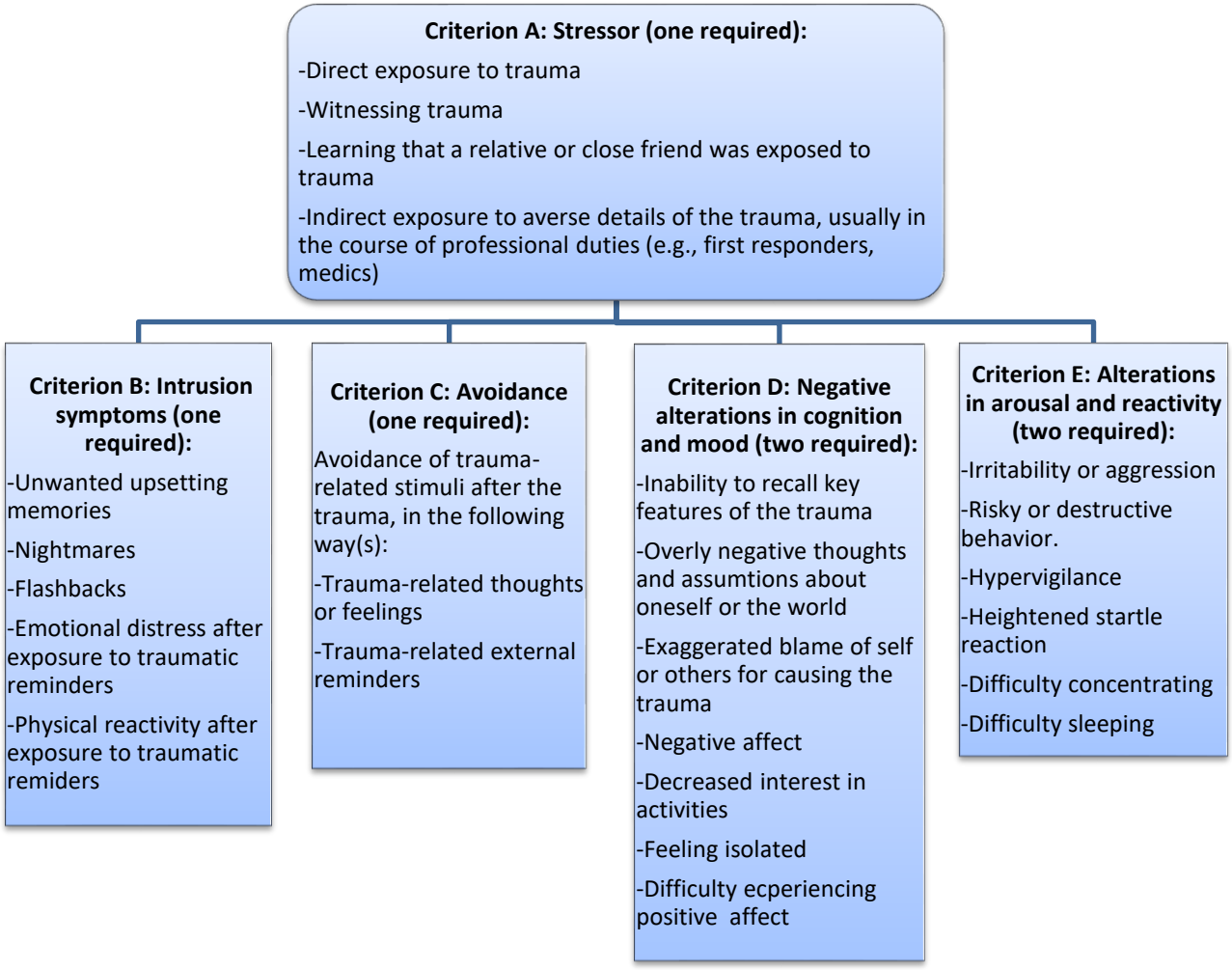
Research has shown that immigrants have a higher prevalence of mental health problems than the host population, and that refugees and asylum seekers appear to be at higher risk than other immigrants (Ekblad & Kastrup, 2013). Trauma history is an important factor in the health of forced migrants, and to be exposed to torture is to be exposed to severe trauma (Sigvardsdotter *et al.,* 2016). Traumatization may be understood as pathological or a psychiatric, the former being most common in dentistry – to wound or injure human tissue. In the following, traumatization will refer to psychological injury - to subject or be subjected to mental trauma (Collins English Dictionary 2014).

> TRAUMA is any disturbing experience that results in significant fear, helplessness, dissociation, confusion, or other disruptive feelings intense enough to have a long-lasting negative effect on a person's attitudes, behavior and other aspects of functioning. Traumatic events include those caused by human behavior (e.g., rape, war, industrial accidents) as well as by nature (e.g., earthquakes) and often challenge an individual's view of the world as a just, safe, and predictable place. (APA Dictionary of Psychology, 2021)

A traumatic experience such as torture is clearly an abnormal event, and thus, the psychological consequences of torture are commonly referred to as “normal reactions to abnormal events”. Regardless of how normal or understandable, the reactions may be devastating to the individuals suffering from them. Common psychological complains are sleep disorders, attention- and memory-disorders, behavioral disorders, and panic attacks (Jaffé, 2008), and torture has been found to be a predictor of posttraumatic stress disorder (PTSD), depression and anxiety (Steel *et al.,* 2009; Sigvardsdotter *et al.,* 2016). Research has shown that the risk for developing trauma disorders following torture increases when the victim has experienced a high degree of control loss. Furthermore, the risk for PTSD increases with the presence of factors such as isolation, deprivation of basic needs, sexual torture, exposure to extreme heat or cold, and being constrained in painful body positions for long periods of time (Başoğlu, 2009).

PTSD is a diagnosis that captures reactions following exposure to trauma, and its consequences may disrupt the entire life of those affected. Criteria and symptoms of PTSD are displayed in Figure 2 (APA, 2013).

Figure 2 Criteria and symptoms of PTSD according to the DSM-5 (APA, 2013):



2.2.2 Oro-facial consequences of torture

Beatings are the most common form of physical torture (Quiroga & Jaranson, 2005), and quite a few torture victims have experienced beatings against the mouth and face (Gillberg, 2006).

Common methods of torture involving teeth, face, or head are:

- Kicks, or strokes with or without tools (e.g., gunstocks)
- Extraction or loosening of teeth
- Filing down teeth
- Electric shocks
- Electric torture, for example involving electrodes connected to and between lips, gingiva, tongue, jaw joint, and/or genitals
- Burns
- Acid attacks
- Suffocation techniques
- Water-torture, including waterboarding
- Exposure to strong light, or persistent darkness
- Being forced to eat excrements or drink urine
- Sexual torture, often involving the mouth
- Lack of possibility to maintain personal hygiene, including oral hygiene

(Arge *et al*., 2015; Jerlang, 1992; Rabin & Willard, 2014)

The most common physical complaints after torture, regardless of sociocultural level or geographic origin are headaches, diffuse pain, gastrointestinal pain, including oral pain, and lumbar and back pain (Jaffé, 2008). Studies have shown that torture victims seeking dental treatment often present with comprehensive treatment needs. Some are victims of direct dental torture, but many suffer from accumulated treatment needs (Lif-Bimer, 1998; Singh *et al.,* 2008). Imprisonment often entails poor condition for personal hygiene, and during the resettlement process, torture victims not always have the possibility or capability to seek or receive dental treatment (Singh *et al.,* 2008). Common orofacial after-effects of torture are displayed in table 2 (Arge *et al.,* 2015; Barenthin, 1995; Bøjholm, 1995; Bølling, 1978; Gillberg, 2006; Jerlang *et al.,* 1995; Jerlang, 1992; Lif-Bimer, 1998).

Table 2 Oro-facial symptoms and sequelae of torture

Symptom group	Symptom/sequelae
Pain	Toothache Headache Myogenic pain Facial pain Hypersensitivity Tenderness
Dental injuries	Loosened teeth Teeth knocked out Teeth extracted for the purpose of torture Tooth fractures Caries Necrotic pulp Discoloration
Temporomandibular problems	Jaw fractures Tenderness / pain Reduced mobility Deviation Eardrum injuries
Soft tissue- or gingival damage	Scars / scar tissue Paresthesias Gingivitis Periodontitis Swelling Bleeding Fissures
Functional consequences	Difficulties with eating Esthetics

2.2.3 Oral health challenges

2.2.3.1 Utilization of oral health services

Utilization of oral health services is low among refugees, and research indicate that refugees from Middle Eastern countries in particular experience barriers to oral health care services (Davidson *et al.,* 2006; Lamb & Smith, 2002; Riggs et al., 2017). In a study of refugees in Serbia, only 11% of male refugees and 35% of women had visited the dentist from the time of arrival (Mandinić *et al.,*2021). Moreover, there is a tendency among refugees to seek dental care only when in need of emergency treatment (Amila *et al.,* 2018; Ghiabi *et al.,* 2014). A high tendency to avoid dental visits has also been found in victims of sexual violence (Larijani & Guggisberg, 2015; Leeners *et al.,* 2007; Willumsen, 2004). By virtue of torture victims often being both refugees and victims of violence, such avoidance behavior may be suspected to apply for them as well.

Well known barriers to utilization of health services in general are language-problems, cost, need for transportation, lack of trust in professionals, and lack of knowledge about the health system (Karlsdottìr *et al.,* 2018). All of the above are relevant also with regard to refugee utilization of oral health services (Ghiabi et al., 2014; Mariño et al., 2012), but recent research emphasizes the importance of systemic barriers such as eligibility for subsidized oral health services, accessibility to oral health services, waiting times and service costs (Due *et al.* 2020). Harris & Allan (1993) also pointed to fear as an additional barrier that might play a stronger role in utilization of oral health services as opposed to general health services.

2.2.3.2 Dental anxiety

In developed countries, about 5% of the adult population suffer from a level of dental anxiety that entails avoidance of dental services and deterioration of oral health. A higher prevalence is found in women compared to men (Armfield *et al.,* 2010; Kankaanpää *et al.,* 2019; Locker *et al.,* 2001; Oosterink *et al.,* 2009; Schuller *et al.,* 2003; Stinson *et al.,* 2007; Svensson *et al.,* 2016; van Houtem *et al.,* 2014). Knowledge on dental anxiety is predominantly based on research populations in Europe, North America, and Oceania (Silveira *et al.,* 2021). An increasing number of studies from Arabic and African countries, however, also report dental anxiety to be a considerable health challenge (Abu-Ghazaleh *et al.,* 2011; Alsadat et al., 2018; Bahammam & Hassan, 2014; Egbor & Akpata; 2014, Fayad *et al.,* 2017; Kheir *et al.,* 2019).

As far as is known, there have been no systematic studies on dental anxiety in torture victims or in refugee populations. However, a pilot study found that asylum seekers displayed higher levels of dental anxiety than other immigrants (Mattila *et al.,* 2016). Moreover, Amila et al. (2019) concluded that displaced persons have increased risk for dental anxiety, which they explain by the propensity of poor oral health and rare dental visits to strengthen 'the vicious cycle of dental fear' (Armfield, 2013; Armfield *et al.,* 2007; Berggren, 1984). Further confirmatory evidence for the vicious cycle may result from the fact that dentists often encounter refugee patients primarily during emergency sessions, when time is limited and pain-free treatment inconceivable (Lenk *et al.,* 2013).

Dental health personnel and oral health researchers working with torture victims have reported observations of dental anxiety in patients previously subjected to torture (Barenthin, 1995; Hashemi, 2006; Jerlang, 1992; Jerlang *et al.,* 1995; Keller *et al.,* 2014; Lif-

Bimer, 1998; Singh *et al.,* 2008). It has been theorized that the nature of the dental treatment situation in itself may trigger anxiety reactions, especially in traumatized individuals. The feeling of being tied to the dental chair, literally underneath dental health personnel controlling sharp instruments, bright light, water, noises, and potential pain may increase the feeling of control-loss and reactivate aspects of the torture situation (Jerlang *et al.,* 1995; Lif-Bimer, 1998). However, there is a need for more systematic research to strengthen the hypothesis.

Controllability seems to play an important role in both dental anxiety and the sequelae of torture. Lack of control has been identified as a primary concern for patients with severe dental anxiety (Milgrom *et al.,* 2009), and sense of control in the dental setting is closely related to perceptions of unpredictability and dangerousness (Armfield et al., 2008). Research on the consequences of torture has reported that that torture methods involving a high degree of unpredictability and uncontrollability increased the victims' perception of distress, and hence their vulnerability (Peltzer, 1997). Thus, it might be expected that when dental anxiety manifests in a torture victim, it is quite likely related to lack of control.

Most previous literature on dental anxiety in trauma survivors have focused on survivors of sexual abuse, who empirically run a high risk of developing dental anxiety (Folayan *et al.,* 2021; Humphris & King, 2011; Leeners *et al.,* 2007; Uziel *et al.,* 2012; Walker *et al.,* 1996; Willumsen, 2004). Whether this knowledge can be transferred to survivors of torture remains to be explored. Nonetheless, dentally anxious sexual abuse survivors frequently report that their reactions are triggered by stimuli that bare similarity to the abuse situations (Fredriksen *et al.,* 2020; Leeners *et al.,* 2007), which may well be the case for torture survivors.

The association between psychological disorders and dental anxiety was described in a comprehensive study as early as 30 years ago, reporting other psychological diagnoses in 42% of participants with dental anxiety (Roy-Byrne et al., 1994). Lenk *et al.* (2013) found that nearly one third of patients with mental disorders suffered from high dental anxiety. PTSD-patients were most affected, with a relative risk of 42%, followed by patients with anxiety disorders and depression. Among mental health patients with dental anxiety, the majority had developed the mental disorder after exposure to emotional and/or physical, often

sexual, abuse. This supports previous studies that has reported a significant relation between dental anxiety and PTSD-symptoms (De Jongh *et al.,* 2003; De Jongh *et al.,* 2006). As previously described, the relationship between torture experiences and PTSD-symptoms is well established (Steel *et al.,* 2009; Sigvardsdotter *et al.,* 2016). On that account it may be speculated that torture survivors run a higher risk of dental anxiety compared to refugees not subjected to torture.

2.2.3.3 Oral health

In war-torn countries, previously functioning systems are breaking down. During the ongoing crisis in Syria, for example, hundreds of dental clinics have been destroyed or closed, and thousands of health professionals have left the country. As a result, there is a marked increase in caries and oral infections in the remaining population, as well as an increase in incidence and severity of traumatic oral injuries (Saltaji, 2015).

Research from a wide range of developed countries have demonstrated that the oral health of newly arrived refugees, both children and adults, is clearly inferior to that of the general population. Refugees on average present with more caries and periodontal disease, more oral pain and infections, and less oral restorations than other inhabitants in the host countries (Al-Ani *et al.,* 2021; Bhusari *et al.,* 2020; Davidson *et al.,* 2006; Ghiabi *et al.,* 2014; Johnston *et al.,* 2012; Keboa *et al.,* 2016; Nicol *et al;* 2015; Riggs *et al.,* 2017; Shah et al., 2014; Solyman & Schmidt-Westhausen, 2018; Van Berlaer *et al.,* 2016; Vered *et al.,* 2008; Zinah *et al.,* 2021). Abu-Awwad *et al.* (2020) found that the majority of refugees in a camp in Jordan perceived their oral health to have a negative impact on quality of life through impacts on the enjoyment of food, feeling of comfort, and ability to perform daily work.

High oral treatment needs, and impaired oral health-related quality of life was reported also in refugees to the Nordic countries in the 1980-ties and 1990-ties (Selikowitz, 1994; Torres, 2000; Zimmermann *et al.,* 1990), but prior to the present study, there had been little focus on refugee oral health in the Nordic countries for the last two decades. Following the flow of refugees to Europe around year 2015, there has been an increase in research focus on refugee oral health. However, focus has mainly been on refugees in general, and thus there is a need for more knowledge about the challenges faced by refugee survivors of torture.

Research has indicated a correlation between impaired mental health and increased oral health problems, which is tentatively explained by the impact of psychological distress on oral hygiene habits, eating habits, tooth grinding, medicinal factors, and utilization of oral health services (Kisely, 2016; Vered et al., 2011). Thus, there may be reasons to expect a correlation between impaired oral health and torture experiences as well.

2.3 Documentation of torture injuries

Documentation of the sequelae of torture is important both in order to enable appropriate health care and rehabilitation, but also for the purpose of future legal compensation. The Istanbul Protocol (United Nations, 2004) is a useful tool which outlines international guidelines on how to conduct investigations into allegations of torture and ill-treatment. It consists of a general section in addition to sections for documentation and diagnostics of somatic and psychological conditions and injuries.

Dental care workers should be careful to document the age, gender, and country of origin of the torture victim, as well as the type of violence experienced towards face, mouth and/or teeth, and scars and injuries on face, lips and/or oral mucosa (Arge *et al.*, 2015; Lincoln & Lincoln, 2010). According to Arge *et al.* (2015), the clinical oral examination should include:

- Caries
- Tooth fractures
- Tooth wear
- Periodontal status
- Examination of oral mucosa
- Symptoms of temporomandibular dysfunctions
- Radiographs: Bitewings (BW) and panoramic x-ray (OPG) as standard. Supplementary apical x-rays when necessary.

An effort should also be made to retrieve journals from any previous post torture dental visits, and the oral documentation should be incorporated in the total investigation (Arge *et al.,* 2015).

2.4 Providing dental treatment to torture survivors

To our knowledge, there is a lack of systematic intervention-studies on the provision of dental treatment to torture survivors. Still, some consensus- and experience-based recommendations may be summed up based on clinical reports (Barenthin, 1995; Bøjholm *et al.,* 1995; Bølling, 1978; Jerlang, 1992; Jerlang *et al.,* 1995; Keller *et al.,* 2014; Lif-Bimer, 1998), knowledge about general health rehabilitation of torture victims (Jaffé, 2008; Nielsen, 2014; Rabin & Willard, 2014; Rothschild, 2000) and the principles of trauma-informed care (TIC) (Bath 2008; Classen & Clark, 2017; Harris & Fallot, 2001; Raja *et al.,* 2015; SHAMSA, 2014) and TIC-adaptions to oral health (Anstorp *et al.,* 2018; Raja *et al.,* 2014; Stalker *et al.,* 2005):

1. Understand the trauma and its physical, mental, and social impact on the torture survivor. Screen for traumatic events but do not ask dental patients to reveal the specifics of their torture experiences.
2. Explore individual triggers: Many situations related to dental treatment may trigger painful memories, and thus there is a risk of psychological re-traumatization.
3. Promote a safe place. Keep in mind that a major purpose of torture is to break down the victims' ability to trust other people.
4. Ensure cultural competence. Use interpreters when necessary.
5. Support patient autonomy. Use patient-centered communication skills and involve the patient in decision-making and treatment planning.
6. Collaborate with other professionals, such as psychologists, physicians, physiotherapists, and social workers.

Nevertheless, more knowledge is needed about the unique characteristics and requirements that applies to dental patients previously subjected to torture, both in comparison to survivors of other types of trauma, and in comparison to provision of other health services to victims of torture.

3. Aims of the thesis

The main aim of the thesis was to explore oral health challenges in refugees subjected to torture, in order to develop new knowledge that can lay the foundation for a better and more targeted oral health service.

Specific aims

The first specific aim was to explore oral health challenges in refugees newly arrived in Norway. Four hypotheses were set out:

1. The oral health of adult refugees is poor compared to the Norwegian adult population.
2. Oral health has a significant impact on daily performances in refugees.
3. Oral health represents a greater challenge to torture survivors compared to refugees who have not been subjected to torture.
4. Torture exposed refugees are at increased risk for dental anxiety.

Further aims were to:

5. Explore the dynamics of what makes dental treatment unsurmountable to a considerable amount of torture survivors.
6. Based on the experiences of torture victims with post-torture dental treatment experience; suggest useful intervention strategies and treatment guidelines for health personnel working with dental treatment and/or treatment of dental anxiety in torture exposed individuals.

4. Material and methods

At the onset of the study, oral health in refugees had not been surveyed in the Nordic countries for more than 20 years, and to our knowledge, there were no systematic studies exploring dental anxiety in torture victims. Thus, initially a quantitative approach was applied to provide an overview of the current situation, and to explore our hypotheses, before deep diving into the challenges of the most vulnerable individuals.

4.1 The quantitative study (papers 1 and 2)

4.1.1 Population

With permission from the Norwegian Directory of Immigration (UDI), quota refugees and asylum seekers with refugee status in the following regular reception centers within commuting distance to the University of Oslo were invited to participate (number of participants in parentheses): Bjørnebekk, Ås (47), Bærum (7), Dikemark (19), Drammen (23), Hobøl (29), Moss (22), Skedsmo (12), Tønsberg (23).

Data was collected from December 2013 to June 2015 and comprised oral clinical examinations and interviews (semi-structured questionnaires) with attending interpreters.

Inclusion criteria:

- Quota refugee or asylum seeker granted refugee status
- Originates from, or has been in transit in a country where torture is known to be practiced
- Ability to give consent according to standard procedures

Exclusion criteria:

- ≤ 18 years old (= included in the public dental care program)
- Asylum application denied or waiting to be processed.
- Not fluent in one of the following languages: Arabic, Amharic, Russian, Somali, Sorani, Tigrinya, English, or Norwegian.

Background data included age, gender, level of education, country of birth, year entered Norway, and preferred language to discuss health issues/receive health education.

4.1.2 Data collection

Oral screening was performed in neutral, non-clinical rooms at the reception centers by one trained dentist (the author), according to methods developed in Boston (Singh *et al.,* 2008). Radiographs were not available.

Prior to the data collection, the dentist examined and re-examined 26 patients at the Dental Faculty at the University of Oslo to ascertain intra-examiner agreement (Cohen's Kappa was 0.91). Inter-examiner agreement was previously established in conjunction with a previous study (Aass *et al.,* 2000).

Oral health measures (see Appendix 1) included registration of presence or absence of dentures, emergency treatment needs, oral pathology, DMFT, tooth mobility, Gingival Index (Løe & Silness, 1963), and Plaque Index (Silness & Løe, 1964).

The semi-structured interview comprised questions concerning the following topics: Perceived oral health, dental care habits, dental care utilization, oral health-related quality of life, dental anxiety, PTSD-symptoms, and trauma experiences (see Appendix 2).

4.2 The qualitative study (papers 3 and 4)

4.2.1 Data collection

The qualitative study was based on semi-structural, exploratory interviews with ten torture survivors who all had experiences with dental treatment in Norway. Such exploratory interviews, often called in-depth interviews, involve the researcher and the informant jointly exploring the relevant topic. Initially, the dialogue is guided by the study objectives as open-ended questions are presented by the interviewer. It is, however, not an aim to standardize the interviews, and to ask questions verbatim in all interviews. Rather, the goal of the questioning is to be flexible and attentive, aspiring to grasp the informants' subjective perspectives, and underlying meanings and motives (Kvale & Brinkmann, 2015; Malterud, 2017). It is inevitable that the interviews are a product of many things including researcher's pre-conceptions, personal and professional experiences and views, communication skills and agendas.

The informants were recruited either by professionals at TADA-clinics, or by professionals who referred patients to TADA-clinics on a regular basis. Given the relatively small target

population, as well as the sensitive nature of the topic, where the informants would be ruminating over previous horrible experiences, the research group did not set out to interview a large number of people. Instead, it was aimed to maximize variation in a limited sample with respect to gender, age, country of origin, time of residence in Norway, torture experiences and experiences with dental treatment.

Inclusion criteria:

- ≥ 18 years old (legal age)
- Previously subjected to torture
- Experience with dental treatment in Norway

Exclusion criteria:

- Unable to give consent according to standard procedures

The informants signed informed consent forms, and all approved that the interviews were audiotaped. All interviews were performed by the first author and interpreters were available when necessary.

Aiming to explore torture victims' challenges with seeking and undergoing dental treatment, and how they prefer, or need to be met in the dental setting, an interview guide was developed (see Appendix 3). Based on the inter-disciplinary professional experiences of the research group, in addition to literature studies, especially with focus on "recommendations for future research", six thematic areas were identified for semi-structured exploration in the research interviews:

1. Expectations - Reflections regarding treatment needs and how they might be met by dental health personnel
2. Confidence - Issues involving trust and understanding
3. Security - Discussing what affects the feeling of security in the dental treatment situation
4. Fear and anxiety - Feelings of fear and anxiety before, during and after dental treatment

5. Satisfaction - Exploring factors contributing to satisfaction with treatment and caregivers
6. Interplay - Interaction and distribution of tasks and responsibility between dentist and patient

The interview guide consisted of lists of questions related to each identified theme. However, in line with the explorative nature of the study, the interview guide was not followed from top to bottom, but rather applied as a checklist, allowing of the interviewer to actively pursue themes that emerged through the informants' reflective processes. Additionally, the interviewer wrote field notes during the interviews, describing informants' nonverbal communication, emotional expressions, and other observations relevant to the narratives.

4.2.2 Analysis

The data analysis was performed using a qualitative content analysis approach as described by Schreier (2012, 2014), aiming to classify the data into categories reflecting what is communicated by the informants, either in direct words or by implication. The recorded interviews were transcribed verbatim by the interviewer (first author) shortly after they were conducted, however striving to maintaining the informants' anonymity. Field notes were included in the documents. After all interviews were conducted, the transcriptions were read several times to ensure familiarity with the content before commencing on the coding. Initial ideas of the meaning content were noted. Then the first author organized the data based on the research objectives. Next, an inductive approach was applied where the first author assessed the transcripts based on recurrent topics and thereby suggested preliminary codes, which again were suggested grouped in preliminary categories. The coded data was revised by all co-authors, who worked together to recognize patterns, giving rise to the development of corresponding themes. Examples of preliminary codes and categories are displayed in table 3.

Table 3 Examples of preliminary codes grouped by preliminary categories

Preliminary categories	Preliminary codes
Interplay / report	Trust Understanding Knowledge Exploration Respect Empathy Collaboration
Impact on quality of life	Pain Eating difficulties Bad breath Esthetics Psychological strain
Reactions	Fear Anger Dental anxiety Flashbacks Helplessness Physical reactions Aftershock Lasting reactions Avoidance Signs
Security / control	Empathy Support Attention Explanation Information Predictability Recognizing difficulties Flexibility Pacing Competence
Access	Treatment needs Social support System challenges Financial issues Language / interpreters

4.3 Ethical considerations

Research involving torture victims entails engaging with potentially psychologically traumatized individuals. Both clinical dental examinations and interviews containing sensitive questions hold the potential to bring about trauma-related reactions in the participants. Thus, in both the quantitative and the qualitative study, emphasis was placed on not involving more research participants than necessary.

The researcher was beforehand experienced with refugee dental patients, including torture victims, and had knowledge about treating dental anxiety. She was trained to be sensitive to signs that the conversation was triggering, and knew how to regulate psychological reactions that might occur. Time was set aside for questions and reflections from the participants, and the researcher was available for telephone consultations subsequent to the interviews.

Following the dental examinations in the quantitative study, participants who chose to, were informed about their rights regarding dental treatment. If called for, participants were referred for treatment either to the TADA-service or to private dental clinics collaborating with the reception centers. Participants who revealed traumatic experiences not related to dental visits, were offered consultations with the public health nurse for further assessment of their needs.

The studies comply with the Declaration of Helsinki (World Medical Association, 2013). The Norwegian Ethics Committee approved both the quantitative study (2013/1080/REK South-East A) and the qualitative study (2015/2154/REK South-East C). In addition, the quantitative study was approved by the Norwegian Directorate of Immigration (UDI).

5. Summary of results

5.1 Participants in the quantitative study

The quantitative study (papers 1 and 2) comprised 173 refugees from 13 different countries, the majority originating from Eritrea, Syria, or Somalia. Table 4 shows number of participants (n), gender, age, time in Norway, experience with dental consultations and proportion with experience of torture by country of origin.

Table 4 Number of participants, gender, age, years in Norway, experience with dental visits and experience with torture by country of origin

Country	n	Gender distribution % men (n)	Age Mean (SD)	Age Median	Years in Norway Mean (SD)	Experience with dental visits % (n)	Torture experience % (n)
Eritrea	62	68 (42)	31.0 (9.8)	29.0	1.2 (1.5)	51.6 (32)	54.8 (34)
Syria	42	88 (37)	34.5 (11.6)	32.0	1.2 (2.1)	97.6 (41)	31.0 (13)
Somalia	31	52 (16)	30.1 (13.6)	26.0	2.4 (2.6)	61.3 (19)	38.7 (12)
Sudan	9	78 (7)	32.3 (12.9)	27.0	0.67 (1.0)	55.6 (5)	88.9 (8)
Ethiopia	8	88 (7)	40.4 (10.0)	42.5	9.1 (3.4)	100 (8)	62.5 (5)
Iran	5	60 (3)	43.2 (17.0)	37.0	3.4 (3.7)	100 (5)	80.0 (4)
Afghanistan	5	40 (2)	42.2 (12.4)	47.0	4.0 (2.2)	60 (3)	20.0 (1)
Iraq	3	0 (0)	36.3 (20.6)	26.0	3.7 (1.5)	100 (3)	33.3 (1)
Libya	2	50 (1)	39.0 (1.4)	39.0	4.0 (0.0)	100 (2)	50 (1)
Nigeria	2	0 (0)	30.0 (1.4)	30.0	5.0 (4.2)	50 (1)	50 (1)
Kazakhstan	2	0 (0)	52.5 (14.8)	52.5	4.0 (0.0)	100 (2)	0 (0)
Gambia	1	100 (1)	35.0 (-)	35.0	5.0 (-)	0 (0)	0 (0)
Estonia	1	0 (1)	41.0 (-)	41.0	6.0 (-)	100 (1)	100 (1)
TOTAL	173	67 (116)	33.4 (12.0)	30.0	2.1 (2.7)	70.5 (122)	46.8 (81)

5.2 Participants in the qualitative study

Characteristics of the informants in the qualitative study are displayed in table 5, however with emphasis on maintaining their anonymity. They are described in the order of which the interviews were conducted and referred to by the fictitious names applied in papers 3 and 4.

Table 5 Fictitious name of participants, gender, approximate age, country of origin, time in Norway, dental treatment experience in home country or in transit, education, and work status

Fictitious name	Sex	Age	Country of origin	Interview language	Time in Norway (years)	Dental treatment pre arrival in Norway	Higher education (university level)	Currently working
Amir	m	48	Iran	Norwegian	15-20	Yes (regularly)	No	Yes
Aaden	m	45	Somalia	English	15-20	No	No	No
Hamid	m	47	Syria	Arabic with interpreter	<5	No	No	No
Farah	f	54	Syria	Arabic with interpreter	<5	No	Yes	No
Farouk	m	56	Iraq	Norwegian	5-10	Yes (regularly)	Yes	No
Gebre	m	35	Eritrea	English	5-10	Yes (emergency)	Yes	Yes
Eyob	m	45	Eritrea	Tigrinya with interpreter	5-10	Yes (emergency)	No	No
Kidane	m	28	Eritrea	Tigrinya with interpreter	5-10	Yes (emergency)	No	Yes
Reza	m	57	Iran	Farsi with interpreter	5-10	Yes (emergency)	Yes	No
Zahra	f	65	Iran	Norwegian	15-20	Yes (regularly)	Yes	Yes

5.3 Hypothesis 1 - The oral health of adult refugees is poor compared to the Norwegian adult population

On average, the participants (paper 1 and 2) had stayed in Norway for about two years. One third had no experience with dental visits prior to the research participation, and 43% had received some dental treatment subsequent to their arrival. However, the treatment was in most cases limited to emergency treatment. Clinically detectable caries lesions were found in 89% of the participants, and half of the participants had one or more tooth gaps due to missing teeth, whereas most refugees presented with less than two filled teeth. About 20% had clinical signs of periodontal disease, despite the relatively young mean age. Table 6 shows mean and median numbers of decayed, missing and filled teeth (DMFT), mobile teeth (> grade 1) as well as plaque- and gingival- indices (Løe & Silness, 1963; Silness & Løe, 1964). Although there were some small but significant group differences that are presented and discussed in paper 1, oral health was generally poor in all refugee groups.

Table 6 Mean and median numbers of decayed, missing and filled teeth, plaque index, gingival index, and teeth with mobility > grade 1.

	Mean	**(SD)**	**Median**
Decayed teeth (DT)	4.13	(3.47)	3.00
Missing teeth (MT)	1.82	(3.67)	1.00
Filled teeth (FT)	1.82	(3.43)	0.00
Plaque index (PI)	1.24	(0.48)	1.14
Gingival index (GI)	1.29	(0.53)	1.25
Mobile teeth	0.80	(2.11)	0.00

Pain from the oral cavity on a regular basis was reported by 38%, and 67% described their oral health as “not good”. Only one in ten refugees considered their oral health very good or excellent. More than half of the participants were unsatisfied with their teeth, and 78% believed they needed dental treatment. The oral screening revealed that every forth participant needed referral for emergency dental treatment.

5.4 Hypothesis 2 - Oral health has a significant impact on daily performances in refugees

Half of the refugees reported reduced oral health-related quality of life (paper 1). Oral impacts on daily performances (OIDP) "at least once-twice every month" and "at least once or twice every week" are displayed in table 7.

Table 7 Oral impacts on daily performances (OIDP)
% reporting problems with… (*a-h*) due to problems with teeth or mouth

	Oral impacts	Monthly	Weekly / daily
a	Eating and enjoying food	48.6	39.9
b	Speaking and pronouncing clearly	15.5	12.1
c	Tooth cleaning	36.4	32.4
d	Sleep and relaxation	30.2	14.5
e	Smiling and showing teeth without being embarrassed	28.3	23.1
f	Being emotionally stable	29.5	16.2
g	Being sociable	25.4	14.5
h	Performing daily work / daily chores	20.8	12.1

Impacts on daily performances due to oral health are often associated with oral pain, but informants point to other oral problems as well. Tooth gaps, for example, may distort pronunciation or hinder smiling, whereas bad breath may affect socializing.

5.5 Hypothesis 3 - Oral health represents a greater challenge to torture survivors compared to refugees who have not been subjected to torture

Torture experiences were reported by 47% of the study population. Within this group, torture involving mouth or teeth was reported by 35%, whereas the face was involved in 62% of cases (paper 2). Among women not exposed to torture, 31% reported systematic abuse.

Specific methods of torture experienced were not recorded systematically, but methods that were mentioned repeatedly, were blows to the mouth with gun butts, hits against genitals and kidneys, burning, sexual abuse, broken fingers, surprise attacks, sleep deprivation and witnessing others being killed. 12 participants presented with visible orofacial scars.

Self-perceived needs for oral treatment were higher among refugees who reported torture experiences (86.4%), compared to other refugees (69.6%, $p<0.01$). Torture victims also

reported lower oral health-related quality of life; OIDP mean sum-score was 29.9 (SD 9.9) in torture victims, compared to 33.3 (SD 7.5) in non-tortured refugees ($p<0.05$). Clinical examinations, however, showed no significant differences in oral treatment needs that were high in both groups (paper 2). Table 8 describes utilization of dental services.

Table 8 Dental treatment experience, reason for seeking dental treatment, and time since last dental visit, in refugees with or without experience of torture

	Tortured refugees (n=81)	**Other refugees (n=92)**
Previous experience with dental visits (%)	69.1	71.7
Dental visits solely for emergency treatment (%)	64.9	60.6
Time since last dental visit (Years, SD)	2.9 (3.2)*	1.8 (2.0)*

*P<0.05

High cost was the most mentioned reason for refraining from dental visits, reported by 51% of refugees who did not see a dentist on a regular basis. Other frequent explanations were no urgent treatment need (33%), difficulty understanding the oral health care system (27%), lack of surplus to prioritize it (16%), and language barriers (11%).

5.6 Hypothesis 4 – Torture exposed refugees are at increased risk for dental anxiety

The mean dental anxiety-score (MDAS) in torture survivors was 9.3, compared to 8.3 in other refugees (NS). However, when controlling for gender, age, education and self-perceived need for dental treatment, refugees with torture experiences were six times more likely to be highly dentally anxious (MDAS ≥ 19) compared to other refugees ($p<0.05$) (paper 2).

Among torture survivors, 53% reported PTSD-symptoms (HTQ-R mean ≥ 2), compared to 21% of other participants ($p<0.01$). The odds of high dental anxiety increased from 6 to 9 in torture victims who reported symptoms of PTSD. Table 9 shows dental anxiety (MDAS≥15)

and high dental anxiety (MDAS≥19) in tortured refugees with symptoms of PTSD compared to other participants (paper 2).

The results also suggested that survivors of dental torture were more likely to report dental anxiety if they had undergone dental treatment subsequent to their resettlement (paper 2).

Table 9 Percentage of participants reporting dental anxiety and dental phobia in tortured refugees with PTSD-symptoms compared to other refugees

	Tortured refugees with PTSD-symptoms (n=43)	**Other refugees (n=130)**	**Sig.**
Dental anxiety (MDAS≥15)	23.3	8.5	p=0.01
Dental phobia (MDAS≥19)	16.3	3.1	p<0.01

5.7 Specific aim 5 - Explore the dynamics of what makes dental treatment unsurmountable to a considerable amount of torture survivors

Throughout the qualitative interviews it was a recurring theme that going to the dentist, and receiving dental treatment, frequently sets in motion severe physical and psychological reactions that are related to previous torture experiences. Such trauma-related reactions may sometimes take effect long before the dental appointment, and may last far beyond. They are often triggered by situations where the torture victim, as dental patient, experiences loss of control, or the ability to act on her/his own will. To engage in dental treatment, entails actively choosing to be placed temporarily in an objectified position, and thereby submitting to the agency of factors, or subjects, related to the clinical setting (paper 3). Addressing the agentic factors as subjects is an analytical choice meant to provide insight in how the phenomenon of submitting to dental treatment is experienced by the informants, as communicated in the interviews.

Three main categories of subjects emerged, holding the capacity to trigger trauma reactions in relation to dental treatment: 1) Pain, or the anticipation of pain, 2) traumatic memories, and 3) the dentist / dental professional. The dentist may be considered the superior agent, given her/his capacity to release both the pain and the memories associated with the trauma (paper 3). Table 10 shows triggers of trauma reactions reported by informants, sorted by categories of agents.

Table 10 Potential trauma-triggers in the dental setting, sorted by main categories

Main categories of triggers	Potential trauma-triggers
Pain	Toothache Post-operative pain Anticipation of pain Sudden, uncontrollable pain Painful anesthetics Anesthetics not working Clinical procedures: - Drilling - Scaling - Probing - Tooth extractions/oral surgery - Electrical devices (Ultrasound, sensitivity tests) - Temperature
Traumatic memories	Dental equipment: - Chair - Machines - Rubber hoses - Metallic, sharp instruments - Syringes - X-rays (also looking at the images) Water Bright light/open eyes Closed eyes/dark glasses/blindfolding Thinking about the treatment People appearing from behind, or other similar surprises Bib around neck (tight) Numbness (from anesthetics) Sounds Smells Vibration Tastes (often blood) Sight of blood Clinical clothing
Dentist	Looks/resemblance to “evil others” from the past The role of the interrogator Hard-handed Lack of information Language difficulties lack of interpreters Personality / behavior: - Disrespectful - Unfriendly - Abrupt - Hasty - Authoritarian Inflicting pain or bringing about traumatic memories

5.8 Specific aim 6 - Develop intervention strategies and treatment guidelines for dental personnel working with torture victims

Building a therapeutic relationship, ensuring patient control, and creating a safe place were consistently addressed directly or indirectly by the informants, and interpreted as important to minimize the risk of psychological re-traumatization of torture victims in the dental clinic. Moreover, most informants expressed vulnerability to the experience of rush and time pressure during dental appointments (paper 4).

Four main themes emerged, that may help dental personnel understand the patients' challenges and thereby adapt the dental treatment: 1) Fear that the dentist does not know and understand, 2) distressful experience of time and pace, 3) the anxiety of surprise, and 4) the horror of losing oversight.

The first theme concerns the importance that the dentist is aware that the patient has been subjected to torture and has knowledge about common challenges faced by torture survivors. Although it is seldom necessary to know the details of the torture experiences, it is of utmost importance that triggers are explored individually. Paying attention to time and pace (theme 2) is important because both high work-speed, and too long waiting time, may give the impression that the dentist is inattentive. Speed may further accentuate the patient's status as a passive object with reduced control over her/his own actions.

Several of the informants express that they generally feel unsafe in many situations. Thus, being surprised (theme 3) may trigger trauma-related reactions. Dental health personnel should emphasize always letting patients know what will happen before it does. This will minimize the risk for negative surprises, as well as increasing the patient's overview (theme 4), which in turn increases predictability. Overview may also be about physical position in the clinical room – that everything the dentist does must be visible.

Table 11 provides an overview of the clinical implications that may be derived from the results of the qualitative content analyses described in paper 4.

Table 11 Clinical advice to dentists to help enhancing the sense of control and safety in torture victims needing dental treatment

Themes	Categories
Acquire knowledge	Basic psychology Torture and its consequences Trauma informed care Cultural understanding The patient's torture experiences
Acknowledge the effect of time and speed	High work tempo may accentuate objectification Rush may signal inconsiderate treatment Unexplained delays may signal that the patient is unimportant
Avoid surprises	Establish a thorough report Explore triggers individually Adapt the treatment to each patient's needs Avoid people suddenly appearing from behind Make sure not to evoke images of interrogation - Ask questions politely and respectfully - Avoid too many people present - if an interpreter is needed, consider letting the secretary wait
Provide overvies	Stay in the patient's field of vision as far as possible Avoid talking behind the patient Ensure predictability by providing information about - Every step of the treatment - All procedures before commencing on them - Treatment alternatives/treatment plan/cost - What to expect following the treatment

6. Discussion

6.1 Methodological considerations

The research group acknowledged beforehand the sensitive nature of the study, and the risk of adding extra burden to an already vulnerable group of individuals. Thus, all methodological choices were all the way influenced by the ethical aspects associated with obtaining information from traumatized individuals, as described in the section on *ethical considerations.*

6.1.1 Combining quantitative and qualitative research

Oral health challenges in refugees, with focus on torture victims, were first explored in a quantitative study based on interviews and clinical dental examinations. A quantitative approach is advantageous to test hypotheses and present the numbers behind the themes discussed, for example to support the hypothesis that torture exposed refugees are more prone to dental anxiety than other refugees. Moreover, the outcomes of quantitative data may often be generalized to a broader population. Quantitative research, however, seldom allows the researcher to explore what lies behind the participants' answers. Even though the researchers, through literature review and professional experience aim to cover all aspects of a topic in e.g. a questionnaire, there is always a risk that noteworthy perspectives are overlooked – which may be especially relevant in an uncharted field such as oral health challenges in torture victims. A mixed-methods approach may also be advantageous in research involving participants with different cultural backgrounds that are likely to influence their perceptions and responses (Agger, 2004).

Although criticized by purist researchers who argue that it is unrealistic to have expertise in both quantitative and qualitative research methods (Bryman, 2008), several advantages with combining quantitative and qualitative research have been proposed (Johnson & Onwuegbuzie, 2004). Of particular relevance to the present study are triangulation and complementarity. Triangulation refers to using different methods to study the same phenomenon that, looking for convergence and corroboration of results, whereas complementarity is about using the results from a second method to elaborate, illustrate, and clarify the results from the first method used (Johnson & Onwuegbuzie, 2004).

Oral health challenges in torture victims were previously relatively uncharted. Adding a qualitative element was considered helpful to give a "voice" to the numbers and dig deeper

into areas that were not fully answered in the quantitative study. Thus, based on the knowledge from the quantitative study, a qualitative study was developed to gain a more in-depth understanding of the dynamics of the triggering of trauma reactions in the dental setting, and what interventions the dental team might apply to help torture victims endure dental treatment.

6.1.2 The quantitative study

6.1.2.1 Participants and setting

In the first part of the study, a cross-sectional study design with questionnaires and clinical dental examinations was applied. Although this provided a multitude of variables to explore statistically, cross-sectional studies will not provide conclusive answers about causes and effects. However, when conducting research on the consequences of traumatic events, such as torture, randomized clinical trials are, of course, ethically excluded. Moreover, although we may not, in our case, argue categorically that torture causes dental anxiety, we may be quite certain that the opposite is not the case.

Recruiting immigrants to research studies are considered to be challenging. They are often described as difficult to reach, there may be language issues, and some are generally suspicious towards official representatives. Thus, most studies on both physical and mental health in refugees are conducted in clinical populations (Stein *et al.,* 2021). The participants in the present study were all residing in reception centers for asylum seekers and were thus in a life situation where little was happening, and time was plentiful. Additionally, it became clear that most had questions about the oral health-care system in Norway and were quite eager to meet a dental professional who came to see them along with a professional interpreter. Consequently, we were able to study a non-clinical population where almost all the invited refugees (97%) agreed to participate.

Sample size was estimated considering the exploration of dental fear in torture victims, and the difference in dental anxiety score between torture victims in the refugee population and a comparable general population. Åstrøm *et al.*'s (2011) study was used for comparison. In a population of 1509 25-year-olds they found a mean DAS-score of 8,7 (SD 3,7). Given significance level 5%, power 90% and least clinical, relevant difference =2, a need for 37 people with torture experience was calculated. It was aimed to recruit 40 torture victims to account for drop out. The study design allowed continuous inclusion of participants, until the

needed power was achieved. To traumatized individuals, participating in research may be a strain, and hence we avoided burdening more than necessary.

For logistical and linguistic reasons, we could not invite all residents at the reception centers to participate in the study. Instead, the questionnaires and consent forms were translated to the six most common languages currently spoken among refugees from countries known to practice torture, according to information provided by the research consultant at the Norwegian Directorate of Immigration. Thus, only residents who were fluent in either Arabic, Amharic, Russian, Somali, Sorani, Tigrinya, English or Norwegian were invited.

The data collections included both quota refugees and asylum seekers granted residency in Norway. Asylum seekers still waiting for decision were excluded from the study for ethical reasons, due to their limited opportunities to apply for financially supported dental treatment. The included groups are both defined as refugees, and hence have equal rights to social- and health-services (Norwegian Directory of Health, 2010). However, there may be clinically relevant differences between the groups that have not been revealed.

Eight reception centers in commuting distance to the University of Oslo were enrolled in the study. The Norwegian Directorate of Immigration ensured us that the distribution of refugees to Norwegian reception centers is random, with the exception of individuals needing long-term hospitalization for somatic or psychiatric reasons. Hence, including centers in other parts of the country would not change the origin or oral health situation of the participants.

Thus, apart from hospitalized refugees, who are unlikely to present with healthier oral conditions, we may conclude that we have interviewed and examined a representative part of the current refugee population in Norway. With respect to representativeness over time, it must be kept in mind that the refugee population is fluctuating, and that the prevalence of torture, or probability of trauma history varies between groups of forced migrants and are highly dependent on the background of the group under study; the place of origin, socio-demographic variables, the conflict, or situation that caused them to migrate and the timing of the refuge.

6.1.2.2 Measures

It is of great importance to apply appropriate measures of oral health and mental health variables since the resulting diagnoses may be used both to guide treatment selection and to justify access to resources. When the research group consists of individuals from culturally diverse populations, cross-cultural validity is a challenge.

Linguistic and cultural challenges

It is important to note the challenge of the cultural framework. The responses to the questionnaires are likely to be influenced by the cultural meaning of symptoms and illnesses, and the social, cultural, and political dimensions of the torture experiences (Agger, 2004). Widely used instruments (discussed in detail below) tested for validity and reliability were applied. They were, however, not tested beforehand in all the relevant languages or cultural groups. The present study involved a heterogeneous group with participants that were to some degree difficult to access. Thus, including testing of all instruments was not possible, neither practically nor ethically.

Back translation and validation of the questionnaires to all relevant languages was not feasible, and thus a professional translation service was engaged (SALITA). Furthermore, the forms were evaluated by the professional health interpreters, who read both the Norwegian edition and the form in their native language during the first interview sessions. Consequently, some adjustments were made to the Amharic questionnaire - a form that had had to be translated from English due to lack of professional Norwegian-Amharic translators. For future research, a back translated Amharic version of the HTQ is now available (Finkelstein, 2016).

The other forms were found satisfactory by the interpreters. Additionally, during all interviews the interpreters used both the Norwegian questionnaire as well as the translation to the respondents' language, a method found useful by other researchers in the field (Rasmussen *et al.* 2015).

Since a significant proportion of the participants were illiterate, and most were inexperienced in filling out questionnaires, the questions were presented and reviewed orally with all participants, and the questionnaires were filled out by the researcher. Early on, it was a clear impression that most participants were concerned with answering

correctly, and with the oral approach it was possible to explain questions that they found difficult to understand. As an additional benefit, there was no missing data.

Advantages and disadvantages of using interpreters are discussed further in a separate section below.

Oral health measures

To objectively measure oral health, widely used measures of which the researcher had previously been tested for inter-examiner reliability were applied (Aass & Gjermo, 2000), such as Gingival Index (GI) (Løe & Silness, 1963), Plaque Index (Pl I) (Silness & Løe, 1964) and numbers of decayed, missing and filled teeth (DMFT). Intra-examiner agreement was tested prior to the data collection. It was expected to lose a significant number of participants if they would have to travel to a dental clinic. Therefore, oral health was screened in non-dental settings – a method that probably resulted in under-estimation of oral disease. On the other hand, it most probably increased the response rate. In addition, it was considered of high importance to avoid sharp instruments that might hold the capacity to trigger trauma-related reactions.

As a subjective measure of oral health, the validated 'Locker's Oral Health Item' was applied (Locker et al., 2005, Thomson et al., 2012). Other questions and response alternatives covering subjective oral symptoms, dental care habits and utilization of dental health services were derived from related research (Ghiabi *et al.,* 2013; Harris & Allan, 1993; Wigen & Wang, 2010; Willis & Bothun, 2011; Selikowitz, 1994; Zini *et al.,* 2009).

Oral health-related quality of life (OHRQoL) was measured using the OIDP (Oral Impacts on Daily Performance) (Aduyanon & Sheiham, 1997), which is widely used and cross-culturally validated (Amilani *et al.,* 2020; Åstrøm & Okullo, 2003). OHRQoL is a multidimensional construct which may be assessed by numerous indices (Bennadi & Reddy, 2013), and our main purpose was to identify oral health challenges in traumatized refugees. Due to the already comprehensive research interview, it was rational to choose a measure that was to the point and not too time-consuming. It was the impression of both the interviewer and the interpreters that the OIDP was easily understood by the participants.

In retrospect, the study could have benefitted from including questions about symptoms from the temporomandibular joint. The relevance, which could have been discovered by a broader literature review (Friedlander et al,. 1987; Friedlander et al., 2004), emerged as several participants mentioned it unsolicited. Dental attrition was examined in the clinical photos but was significant in too few individuals to perform statistical analyses.

In retrospect, we also realize that questions about self-medication, alcohol and drug-use could have strengthened the study. However, considering the clear impression that many respondents were willing to speak openly precisely because the interviewer was a dentist, not a psychologist, such questions might also have weakened the confidence.

Dental anxiety

Dental anxiety was measured using the Modified Dental Anxiety Scale (MDAS) (Humphris *et al.,* 1995), which is an improved and extended instrument based upon the Dental Anxiety Scale (DAS) (Corah, 1969), to which it may easily be converted. The MDAS is widely used both clinically and in research and is short and easy to administer (Humphris, 2021; Milgrom *et al.,* 2009). Moreover, cut-offs are determined for degrees of dental anxiety in comparison to DSM-IV-criteria, it has not been seen to rise anxiety in respondents, and several validated translations are available (Humphris, 2021), the Norwegian (Haugejorden et al., 2000) and Arabic (Abu-Ghazaleh et al., 2011, Bahammam & Hassan, 2014) translations of relevance to the present study.

It was a challenge that one third of participants had no previous experience with dental visits. For some of these individuals, it was difficult to foresee how they would react in a situation that was unknown to them. Only 3% of the total population reported dental anxiety as a reason for not seeking dental care. Quite a few stated that they *"had lived through so many bad experiences"* and therefore believed undergoing dental treatment to be *"nothing".* To others, e.g. survivors of dental torture who last saw a dentist prior to their torture experiences, their reactions to dental treatment might have changed without their knowing. As an example, one of the participants told the researcher that he was used to dental treatment and had no problems with it. However, as she approached him with the penlight and dental mirror, he fainted. These challenges were thoroughly considered in the analyses of the data, and it was concluded that a higher validity of the responses would most

likely have increased the prevalence of reported dental anxiety, and thus strengthened our results correspondently.

Symptoms of posttraumatic stress (PTSD-symptoms)

To evaluate PTSD-symptoms, we applied the 16-item symptom list of the Harvard Trauma Questionnaire (HTQ) (Mollica *et al.,* 1992) (see Appendix 2) derived from the PTSD-diagnoses (DSM-III-R). The HTQ is the most widely used measure in screening refugees for trauma-related symptoms (Morina *et al.*, 2018), and is commonly used by trauma researchers (Darzi, 2017; Stein *et al.,* 2021). It has been evaluated to be a useful instrument across a number of languages and many cultures (Mollica *et al.*, 1992; Gorst-Unsworth *et al.,* 1998; van Ommeren, 2000; Tang & Fox, 2001; Sabin *et al.,* 2003: Mollica *et al.,* 2001, Shoeb *et al.,* 2007).

However, it must be kept in mind that the HTQ was originally designed to assess mental health in refugees from South-East Asian countries in the 1980's (Mollica *et al.,* 1992), and there is evidence to suggest that the expression of intense emotional distress following traumatic events may be subject to cultural variation (Rasmussen *et al.,* 2015). There is an on-going debate as to whether Western mental health diagnoses such as PTSD may readily be reproduced in all ethno-medical systems (Summerfield 1999 and 2004).

Darzi (2017) found the 16 PTSD-items of the HTQ to provide reliable scores across diverse populations. With respect to validity, the convergent validity-properties of the items were supported to some degree, but the discriminant validity properties were not.

Studies have indicated that response style in questionnaires is culturally defined (Heine *et al.*, 2002; Smith, 2004) and that the responses are often extreme towards the low end of the scale (Sachs *et al.,* 2008). In the present (quantitative) study, the Somali interpreter pointed out that the Somali language does not have words for expressing emotions, and it was noted that especially the Somali respondents had a tendency to respond toward either the high or low end of the scales. Youngmann *et al.* (1999) found that migrants from Ethiopia primarily expressed mental distress through somatic symptoms, especially head-aches, heart-worries and stomach-complaints. They attributed their symptoms mainly to external factors such as acculturation and spiritual influences.

Rasmussen *et al.* (2015) pointed out that diagnostic measures relying on item scores is generally a challenge when comparing individuals across cultures and global regions. Thus, they recommend using more than one measure. Moreover, the research group who developed the HTQ 25 years ago are currently testing the validity and reliability of a new revision, HTQ-5, in which fully developing the refugee-specific functioning items is a major goal (Berthold *et al.,* 2019).

In the present study, the HTQ proved to be the most time consuming and challenging part to fill out, and it was unquestionably important to most participants to provide true answers. However, in a future follow-up study, an additional measure should be considered, for example the Short PTSD Rating Interview (SPRINT) (Connor & Davidson, 2001) or the Posttraumatic Diagnostic Scale (PDS-5) (Foa et al., 2016).

Torture exposure

In the ethical pre-evaluation of the project, it was emphasized that questions concerning torture experiences were asked prior to filling out the HTQ. The goal was to give the participants a chance to build trust in the researcher, and prepare them for what was coming. Direct questions about torture exposure were asked, without discussing the definition of torture. Thus, there is a chance that some of the alleged torture survivors were in fact survivors of political violence, should the definition be followed strictly. However, subjectively they perceived themselves to be victims of torture.

Insomuch as being a torture victim is closely associated with shame, few are inclined to stand out on false premises. On the contrary, there are probably large dark numbers (Norwegian Red Cross, 2020). A recent Italian study reported that in 196 cases of claimed torture among asylum seekers, only 2.5% were excluded by the medico-legal expert team (Ilenia *et al.,* 2021). Besides, all participants in the present study were granted permanent residency in Norway, which further reduced the risk that someone would bend the truth to strengthen their legal case.

Moreover, it is often the goal of the torturer to harm the victim as much as possible without leaving visible scars. This may be true also for torture involving mouth or teeth. From the qualitative study, we have learned that refugees subjected water-torture often experience

flashbacks in the dental chair. In retrospect, we regret that we did not include a direct question about water-torture in the questionnaire.

6.1.2.3 Statistical analysis

The questionnaire included questions with multiple alternatives, which is considered appropriate to increase the possibility that the respondent finds an alternative that corresponds to their experience. In the statistical analysis, several variables had to be dichotomized, thus replacing the original response alternatives with two values. The MDAS has determined cut-off values (Humphris, 2021) and for the HTQ-R we applied the most common cut-offs for PTSD (≥2.5) and for PTSD-symptoms (≥2.0) (Mollica *et al.*, 1992; Mollica et al., 1993; Lie, 2002).

With regard to other questions, categories with almost the same meaning were merged in retrospect. For example, there response alternatives to the OIDP were dichotomized to 'regularly' ('every day' and 'once-twice a week') and 'infrequently' ('once-twice a month', 'less than once a month' and 'never') (papers 1 and 2). Although categorization was considered necessary to perform the statistical analyses, there is a risk of losing information differences between individuals as well as loss of statistical power.

Statistical analyses were performed using SPSS 24.0 (IBM, Chicago, IL, USA). Differences between groups were tested using Person's chi squared tests or Fisher's exact test for categorical variables and unpaired t-tests, Mann-Whitney U-test or Kruskal-Wallis H-test for continuous variables. DMFT and OIDP met the assumptions for linear regression, and thus associations were studied in a multiple linear regression model adjusting for demographic variables. Scores for dental anxiety are rarely normally distributed since the majority of people are not dentally anxious. This applied to the present study as well and thus it was considered appropriate to dichotomize and study associations between torture experience and dental anxiety in a logistic regression model.

Power was calculated based on the purpose to study dental anxiety in torture survivors. Thus, the number of participants was not high enough to detect possible differences between torture victims and other refugees with respect to objective oral health measures. It may be argued that oral treatment needs were markedly high in both groups, and that including participants until a possible significance was detected, would require involving a

number that could not be ethically or economically defended. If oral health examinations were included in the health-screening of newly arrived refugees, the question might be possible to answer. To date, this screening in Norway only includes one subjective question whether the person “has any ailments from teeth or mouth” (Norwegian Directorate of Health, 2010; IS-1022).

6.1.3 The qualitative study

Qualitative research has a unique capacity to gain understanding of the research participants’ experiences and underlying motivations, and may be especially useful in fields that are fairly uncharted (Denzin & Lincoln, 2011; Elo & Kyngäs, 2008). Seeing as the quantitative study supported the hypothesis that refugees subjected to torture experience more oral health challenges that other refugees, a qualitative approach provided a means to further explore the nature of these challenges. In addition, it provided the opportunity to elicit new ideas and strategies on how to facilitate dental treatment to survivors of torture. The experiences from the quantitative study contributed to increased understanding of the challenges to be explored in the qualitative study.

Given the sensitive nature of the topic, individual in-depth interviews were chosen over group sessions. As being subjected to torture violates an individual’s feeling self-worth and bodily autonomy, and thereby entails a loss of trust in other people (Bernstein, 2015), torture victims were not considered probable to speak freely in a group of people. Furthermore, it was not feasible to restrict to informants who were fluent in Norwegian or English, and thus the use of interpreters was necessary. Group sessions with multi-lingual interpretation was not within the realms of possibility.

The collection of qualitative data is highly dependent on the experiences and skills of the researcher. Regardless of personal chemistry and reassuring interview behavior, the method assumes that information is produced through conversation between strangers (Gubrium & Holstein, 2001). The researcher aims to enable the informants to report freely on their opinions and experiences, whether positive or negative (Hilden, 2014). It was probably a considerable strength to the study that the interviewer was experienced in providing dental care to both refugees and dentally anxious patients and had recently completed the 173 semi-structured interviews in the quantitative study. She was beforehand trained in skills for communicating with patients, which among other things is important to reduce fear and

anxiety, and communicate both effectively and empathetically (Silverman et al., 2013; Torper et al., 2018). Experience had increased her cultural awareness, and she was practiced in working with interpreters, knowing how to communicate through them, keeping focus on the informants. Just as important, she was skilled to recognize signs that the conversation was triggering to the informant, and knew how to help over-activated or under-activated individuals regulate themselves back into their window of tolerance.

There will however always be an inherent influence of the researcher's preconceptions. Attempts to limit subjective bias were made, consisting of all authors taking an active part in the planning of the study and all stages of the analysis process. It may be considered a strength that the authors had different professional and academic perspectives. Nevertheless, there is no guarantee that there were no interpretation errors.

The informants had all undergone dental treatment subsequent to their torture experiences, often with difficulty. Thus, they had all spent some thought on the challenges with seeking and undergoing dental treatment prior to being invited to participate. It was the impression of the interviewer, and the researchers who co-analyzed the material, that most of the informants were eager to share their reflections and experiences despite the sensitive nature of the topic. Even informants who showed strong emotions when talking about their torture exposure appeared to find it important to contribute. In some situations informants had difficulty finding the right words on a topic not previously articulated, they were however ready to ask for the researcher's opinion and to check that she had grasped the meaning of their utterances. Having said that, a few informants also appeared to have alternative, or multiple agendas for participating, trying to influence the researcher to take part in political activism or to get a second opinion on their dental situation. This may have partly influenced the informants' presentations. The researcher, however, was clear that she had plenty of time for off-topic conversation subsequent to the interviews, which seemed to increase their focus on the research questions.

Qualitative research is highly based on open-ended questions, intending to elicit the informants' opinions and judgements. However, as the study populations are relatively small, the information retrieved is highly dependent on the sample. Recruiting informants to the present qualitative study was a challenge. This was largely due to the fact that very few

torture survivors have sought out the TADA-service (Lønning *et al.,* 2021). However, the recruiters also experienced that some traumatized individuals had a high threshold to agree to participate. They sensed that many torture survivors considered it too stressful and demanding for them, both to show up for an interview, and to go through with it. Participants were offered no direct reward other than refund of travel expenses, the opportunity to ask questions to a dental professional, and to contribute on a societal level. It may thus be argued that the study is predominantly from the perspective of torture victims who have the mental resources to engage in dental treatment and to expose themselves in order to help others. As a consequence it may be speculated that torture victims' challenges with seeking and receiving dental care are in fact even more comprehensive than what is reported here. Thus, the low number of torture victims seeking out the TADA-service may theoretically be related to avoidance – either due to dental anxiety, or due to finding the care-seeking process too overwhelming. Recently arrived refugees may be preoccupied by the bureaucracy of the immigration process, and the challenges with resettling in a new country. Traumatized individuals may not be psychologically or physically able to prioritize or oral health. Furthermore, torture survivors' lack of trust in authorities and public service providers (Amnesty, 2021; Garoff *et al.,* 2021) must also be taken under consideration, as it may be seen in connection with both the utilization of the TADA-service, and with a possible distrust in researchers and research institutions.

The concept of saturation is often used in qualitative research as a criterion for when collecting additional data will not contribute with new relevant information (Saunders *et al.,* 2018). Saturation as a "gold standard" for recruiting in qualitative studies has been questioned by researchers (Malterud *et al.,* 2016). Saturation has to be based on a cumulative process where informants with different backgrounds and properties from the targeted study population are recruited. If the recruitment is skewed, the data may appear saturated, but in fact only represent a small fraction of a population. Malterud *et al.* (2016) proposed the concept of "information power", claiming that the more information the sample contains with relevance to the study in question, the lower number of participants are required. Thus, in the present study it was aimed to maximize variation with respect to variables relevant to the universe under exploration. Additional informants may have added new dimensions to the study, especially as severe mental health problems may have

precluded many torture victims from participating. It may nevertheless be argued that the final sample of informants represented a satisfactory variation with respect to origin, sex, age, and experiences with dental treatment and methods of torture. Diversity was also reflected in the informants' ability to reflect on articulate on their experiences. The sample were without doubt comparable to other qualitative research involving torture survivors (Isakson & Jurkovic, 2013; Taylor *et al.,* 2013).

In qualitative research it is often found useful to conduct repeated interviews with some or all informants, as this may provide the opportunity to elaborate on themes that have emerged later on in the research process, or issues that arose in the first interviews but were not fully explored at the time. New reflections may also have come to light in the informants following the interviews (Hilden & Middelthon, 2002). In the research protocol, we had secured the opportunity to contact the informants again. However, for ethical reasons, considering the comprehensive and nuanced information gained assessed against the considerable psychological strain it had been on some of the informants to talk about their experiences (see *results sections in papers 3 and 4*), the interviews were not repeated.

Due to the qualitative method, with a small sample where variation was limited in spite of strategical recruitment, generalization and quantification was not a goal. The scope of the study was rather to shed new light on a relatively unchartered field, which was achieved through explorative interviews. Accordingly, no attempt was made to quantify the number of informants "affected" by each topic, which would also serve little purpose in such a small sample of explorative interviews. However, an estimate is reflected through consequent use of the words 'all', 'most', 'several', 'half', 'some', 'a few', and 'none'. With respect to privacy and ethical guidelines, the presentations of the informants (papers 3 and 4) were written in a way that ensured their anonymity.

6.1.3.1 Content analysis

Qualitative content analysis is one of numerous approaches to the analysis of qualitative data, however widely used in qualitative research on health-related topics (Elo & Kyngäs, 2008). Qualitative content analysis involves describing the manifest content – the text itself, and classifying the research material into identified categories representing explicit or inferred communication. Thus, it also entails providing interpretations of the latent content – what the informant is *saying without saying*. It is a systematic process of coding and

identifying themes or patterns (categories), which is useful being that the interview technique has aimed to be as unobtrusive as possible, and as capable as possible of opening up for reflection through an explorative conversation. The systematic approach also enhances transparency, which is strengthened further by involving more than one researcher in all stages of the analysis process. Systematic examination of the data challenges the interpretations and reduces the risk that the analyses are outweighed by the researchers' preconceptions (Graneheim *et al.,* 2017; Krippendorff, 1989; Schreier, 2012; Schreier, 2014).

Content analysis is often described as inductive or deductive, where the deductive approach is appropriate when the objective is to test existing theory, and codes and categories are preconceived (Elo & Kyngäs, 2008; Graneheim *et al.,* 2017). With regard to dental treatment of torture survivors, prior knowledge was limited, and the objective was to extract new theory. Thus, the exploratory nature of the project was emphasized. Open coding was pursued, aiming to keep an open mind to what was in the material. Some relevant themes had, however, been pre-defined in the interview guide in line with the aims of the study. Thus, in the analysis process, in search for the "true" meaning content of the data, the researchers strived to alternate between a top-down and a bottom-up approach. As the process will always to some extent be influenced by the researchers' silent knowledge and preconceptions, it was aspired to combine analysis based on prior knowledge (often called top-down or deductive coding) with open reading, coding, and interpretation of the data (often called bottom-up or inductive coding) to cultivate exploratory capacity for the unknown. Thus, we argue that pure inductive qualitative analysis is hard-to-reach, and that it may be suggested that the content of the present qualitative study was analyzed using a mixed inductive-deductive approach.

Critics have pointed to the danger that in the application of a coding technique with the intention of extracting and grouping meaning content, and looking for connections within and between the interviews, there is also a risk of distorting and fragmenting the material (Cho & Lee, 2014). Nevertheless, the focus of the content analysis technique on grouping categories systematically with respect to the research question, aiming to uncover underlying meanings and thus facilitate the interpretation of the data (Schreier, 2012; Schreier, 2014), as well as its suitability to describe and conceptualize multifaceted, sensitive

phenomena (Elo & Kyngäs, 2008) made it the most applicable choice of method. The research group's previous experience with the method was also an advantage. To counteract the risk of fragmentation, throughout the analyses the researchers sought to bear in mind that all statements are given in a context. What is said must be read and understood in relation to e.g. the phase of the conversation where it is stated, the overall experiences of the informants, and the informants' understanding of the intentions of the interviewer (Kvale & Brinkmann, 2015).

The interviews were transcribed shortly following the interviews to make sure the researcher remembered the informants' gestures and emotional expressions, which were added to the transcripts. As new interviews were conducted, the researcher gained an enhanced insight that probably increased her ability to understand and interpret what was conveyed by informants in later interviews. Analytical notes were written down, but content analysis was performed on the material as a whole when all the interviews were conducted.

Due to the limited sample of the study, with only ten interviews, the authors developed a closeness to the transcriptions. NVivo, which is the most used software program for qualitative analyses (Cypress, 2019), was tested in the initial phase of the data analysis process. However, the researchers found it relatively unproblematic to keep track of the codes and categories manually. In qualitative research, software is mainly a tool to assist the analyses - it does not perform them. Software programs allows the researcher to organize, store, and retrieve the data, making it useful for handling and managing large data sets (Cypress, 2019). The use of software, however, does not eliminate the intellectual exercise of generating the codes or analyzing the material, and does not adequately address the contributions of context and social interactions (Atherthon & Elsmore, 2007). Additionally, researchers claim that it has not yet generated superior results (Cypress, 2019). Thus, in the present study no additional gain was found in computer-based coding.

6.1.4 Working with interpreters

The use of interpreters was a prerequisite for conducting the interviews in both the quantitative and the qualitative study. However, working with interpreters, as well as communicating in non-native languages, may hinder the way nuances of thoughts and meanings are expressed and interpreted. The use of interpreters may also have represented a limitation to the quality of the transcripts, which were written by the researcher posterior

to the interviews, and could therefore not be written in the informants' native language. Involving interpreters in the transcription-process as well might have remedied this challenge. On the other hand, some studies have shown that patients more often talk to health care personnel about traumatic events when a professional interpreter is present (Eytan *et al.,* 2002). The language challenges may also prompt deliberate probing and discussion of concepts and terms, thus potentially strengthening the exploratory capacity of the research interviews.

A Swedish study reported that Arabic-speaking migrants' considered the use of interpreters in healthcare both a possibility and a problem. They suggested that to avoid inappropriate treatment, the interpreters should be professionals who shared the same origin, dialect, gender, religion, and political views as the patient (Hadziabdic & Hjelm, 2014). Often, and especially when and in-person interpreter is required in an area with few immigrants, it may be difficult to locate a person who fulfills all these criteria who is not previously acquainted with the informant. Additionally, it is questionable whether it would be possible to ensure shared political and religious views in dealing with professional interpreting services. Telephone-interpreting was tested in the preliminary phase of the quantitative study, but not found satisfactory. On several occasions there was a need for the interpreters to be able to sit down with the researcher and the participants to read and point at scales in the translated questionnaires. Moreover, arranging the logistics so that the interpreters were engaged for whole days seemed to motivate the interpreters to sign up for further assignments. This was considered a strength since they had gained an understanding and familiarity with the project. Interpreters who felt as an integral part of the project also volunteered cultural guidance that increased the understanding between the researcher and the participants.

For practical and logistical reasons it was in the interest of the researcher to interview and examine at least 4-6 refugees at each day of field work in the quantitative study. Therefore, despite great effort from the personnel at the reception centers, it was not a practicable aim to match interpreters with the preferences of all participants. However, in cases where concern was expressed, the sessions were postponed or completed in English if applicable. There is however a risk that some participants held back information due to lack of trust in the interpreters. In the qualitative study, however, it was possible to forward the

interpreters' given background information to the informants for approval. Two of them had regular interpreters who they used in all relevant situations. It was made sure that the interpreters were skilled in translating health conversations, and all were briefed before the interviews.

6.2 General discussion

Oral health in current refugees is generally poor. The caries burden is high, and about 40% live with oral pain on a regular basis. Dental screening in reception centers revealed that ¼ needed emergency dental treatment. In a recent study the authors point toward a deterioration of oral health in Norwegian adults (Hadler-Olsen & Jonsson, 2021). Nevertheless, 48% reported good oral health, which is far more than the 33% of refugees. In a previous study, 71% of Norwegian adults reported good oral health, whereas only 7% claimed their oral health to be poor (Dahl *et al.,* 2011). There may be cultural differences in what is reported as "good" or "not good". Self-reported oral health in Norwegian adults was closely linked to whether the participants were caries free (Hadler-Olsen & Jonsson, 2021). On the other hand, very few refugees reported their oral health as poor if they had one or two small caries lesions.

About 50% of Norwegian adults in a recent study had zero carious teeth (Hadler-Olsen & Jonsson, 2021), whereas in the present study only 11% had no clinically detectable caries. Mean DT in refugees was 4.1 (SD 3,5), which was four times higher than in a comprehensive Norwegian study (Holst & Schuller, 2011). For filled teeth the relation was six to one, but opposite, probably reflecting the high need for dental treatment in refugees. The refugee population also presented with more dental plaque (PI mean 1.2 ; SD 0.5) than adults in a Norwegian study (PI mean 0.5 ; SD 0.4) (Stein *et al.,* 2018), whereas gingival index (GI) was about 1.3 in both study populations. Although most of the refugees brushed their teeth on a daily basis, only about 60% brushed them twice a day, and few were familiar with interdental tooth cleaning (paper 1), which may be related to the larger accumulation of plaque. A possible explanation for the lack of differences in GI, may be the relatively young mean age of the refugee population.

The hypothesis that the oral health of adult refugees is poor compared to the Norwegian adult population is supported. As the numerical differences were evident, it was not found necessary to get hold of Norwegian data to perform statistical analyses. Oral health in

refugees has also been found to be inferior to that of other immigrant groups (Davidson *et al.,* 2006; Ghiabi *et al.,* 2014; Mattila *et al.,* 2016).

The results are supported by other recent studies on oral health in adult refugees. Refugees in Germany, studied in the same time period as the present study, showed comparable results. Mean numbers of DT, MT and FT were 4.0, 1.5 and 0.9 respectively, 87.5% had untreated caries, and dental plaque was widespread (Solyman & Schmidt-Westhausen, 2018). Refugees in general have more tooth decay, more periodontal disease, more oral symptoms, and fewer dental fillings compared to host populations (Al-Ani *et al.,* 2021; Goetz *et al.,* 2018; van Berlaer *et al.,* 2016; Zinah *et al.,* 2021). A literature review in which paper 1 was included, identified high caries prevalence and limited access to dental services as main challenges faced by refugees in Europe (Bhusari *et al.,* 2020). Oral complaints were also recognized as a significant predicament in a study addressing general health in Greek refugee camps (Hermans *et al.,* 2017).

Less than half of the participants had received dental treatment after arriving in Norway, and dental visits were mostly limited to emergency treatment. The results fit well with findings in other refugee studies (Amila *et al.,* 2018; Freiberg *et al.*, 2020; Ghiabi *et al.,* 2014; Goetz *et al.,* 2018; Mandinić *et al.,* 2021). Goetz *et al.* (2018) found that 84% of refugees had not visited a dentist in their childhood, which may be seen in relation to the low number of dentists in most originating countries (WHO, 2017).

In the present study, the most prominent reason for not seeking preventive dental care was cost, followed by no self-perceived urgent treatment needs, not understanding the oral health care system, low priority due to other more pressing problems, and language challenges. Expenses and language were also emphasized by Mishori *et al.* (2017) as barriers to help seeking in refugees, in addition to cultural factors. A recent review divide barriers to dental care access in refugees into four sub-groups: affordability (cost and financing), accessibility (transportation problems and cultural norms), accommodation (language barriers, lack of interpreters, and waiting lists), and acceptability (dental anxiety, negative encounters, oral health beliefs, cultural influences, and perceived discrimination) (Paisi *et al.,* 2020). Mandinić *et al.* (2021) concluded that oral treatment needs in refugees should be identified earlier, and that this would lead to less costly procedures in the long term.

Half of the refugees reported that oral complaints negatively affected their daily life performances at least once a week. The most reported oral impacts were pain-related eating-problems and difficulties with tooth cleaning. Moreover, as many as 1/3 reported that oral health problems made them emotionally unstable at least once a month. Abu-Awwad *et al.* (2020) reported that the majority of refugees in a camp in Jordan perceived significant oral impacts on quality of life. They argue that the oral complaints seemed to affect the physical aspects of quality of life more than the psychological, through impacts on the enjoyment of food, feeling of comfort, and ability to perform daily work. They do, however, not discuss for example how inability to do daily chores may have a secondary effect on mental health. Moreover, they do not address dental anxiety, and its relation to PTSD. In a study of Syrian refugee children, dental pain – which was common – was associated with anger, frustration, and "change of psyche" (Pani *et al.,* 2017).

In comparison, Åstrøm *et al.,* (2005) concluded that oral health problems had little impact on the daily performances of Norwegian adults. The majority of Norwegian adults reported good oral health and satisfaction with their teeth (Dahl, 2011; Ekback *et al.,* 2010). A detrimental effect on oral health-related quality of life was, however, found in Norwegian populations living in disadvantaged socio-behavioral conditions (Åstrøm *et al.,* 2011).

It may be concluded that oral health challenges have a significant impact on daily performances in current refugees. However, to the extent that the oral complaints are due to physical ailments, they may to a large degree be relieved by the provision of dental treatment. Keller et al. (2014) point out that despite the challenges faced by dental personnel working with trauma survivors, the reward of helping these patients increase their social well-being and overall quality of life makes the work worthwhile.

A significant proportion of current refugees have been subjected to torture or other systematic abuse. Torture often involves blows to the face, and mouth or teeth are affected in at least one third of cases. Torture victims reported higher subjective dental treatment needs than other refugees (86% vs. 70%, $p<0.01$), and more oral impacts on daily performances. Objective oral health measures however showed no significant group differences. As treatment needs were high in both groups, there is a possibility that significant differences would be detectable in a larger study population.

Although the objective amount of oral disease is the same in tortured refugees as in other refugees, it may possibly represent a higher burden to individuals who are struggling in many areas of life. Although there were no clinically measurable differences, it was clear that oral health problems were a greater challenge for torture survivors compared to other refugees.

Preoccupation with other life concerns may also have affected utilization of dental services. Despite the self-perceived high need for dental treatment, time since last dental visit was over one year longer for torture victims compared to other refugees. Meanwhile, the postponing of dental visits may also be related to dental anxiety.

The hypothesis that torture experiences may predispose to dental anxiety was supported. When controlling for demographics and self-perceived dental treatment need, torture exposed refugees were six times more likely to report high dental anxiety (MDAS-mean ≥ 19) compared to other refugees. In torture victims with PTSD-symptoms (HTQ-R mean ≥ 2) the odds for high dental anxiety increased to 9. Despite the fact that mean MDAS-scores in refugees, regardless of torture experiences, were not higher than in general populations (Humphris *et al.,* 2013), about ¼ of the torture exposed refugees who suffered from PTSD-symptoms also reported dental anxiety (MDAS ≥ 15). In comparison, Strøm *et al.,* (2020) estimated that 8% of Norwegian 18-year-olds were dentally anxious.

Associations between dental anxiety and PTSD-symptoms has been reported previously (De Jongh *et al.,* 2006). It is a criterion for PTSD that its onset is triggered by one or more traumatic incidents (APA, 2013). Similarly, research has indicated that dental anxiety is also to a large degree set off by traumatic experiences. In a recent Norwegian study, 82% of adults who scored 19 or higher on the MDAS reported previous traumatic experiences (Nermo *et al.,* 2021). The most documented triggering events are negative dental treatment experiences (De Jongh *et al.,* 2006; Humphris & King, 2011), but strong correlation has also been reported between sexual abuse and dental anxiety (Willumsen, 2004). These previous findings fit well with the relationship between torture experiences and dental anxiety reported in the present study.

PTSD-symptoms were reported by over half of the tortured refugees, compared to about one fifth of refugees who did not report torture experiences. The study supported findings

from previous research concluding that PTSD-symptoms are more prevalent in refugees subjected to torture (Dalgaard *et al.,* 2021; Shrestha *et al.,* 1998; Sigvardsdotter *et al.,* 2016; Steel *et al.,* 2009), despite the fact that most refugees have been exposed to trauma to some extent. It may be argued that whether a torture victim becomes dentally anxious is largely dependent on the consequences of the torture on the individual. Thus, a torture survivor who suffers from PTSD-symptoms will also be more prone to dental anxiety.

Although the majority of torture victims (3/4) did not report having difficulties with undergoing dental treatment, a significant proportion seemed to suffer from dental anxiety to a degree that they chose either to avoid dental visits, or to endure them with intense fear or anxiety. When considering the joint burden of self-perceived oral treatment needs, oral impacts on daily performances, and dental anxiety, oral health does clearly represent a greater challenge to torture victims compared to other refugees. Although the relationship between torture exposure and oral health challenges has been suggested previously (Keller *et al.,* 2014; Singh *et al.,* 2008), the present study represents, to our knowledge, the first systematic approach to the topic. Moreover, the qualitative study is assumably the first study to explore in depth what these challenges entail.

Seeking and undergoing dental treatment was described as a considerable, often unsurmountable, challenge also by torture victims in the qualitative study. Through the analysis an image emerged that these challenges are often related to the temporary suspension in an objectified position which is a natural consequence of the dental treatment. Being objectified, submitting to the control of another, has also been described in previous studies as a problematic aspect of dental treatment, potentially related to trauma coupling (Larijani & Guggisberg, 2015; Leeners *et al.,* 2007; Wolf *et al.,* 2020).

In the present study, an analysis was proposed of what was denominated the social and material dynamics of the triggering processes that complicate torture victims' ability to engage in and tolerate dental treatment. It was suggested that several potential "others", i.e. agents, or subjects, hold the position to act on the objectified dental patient. Three main categories or subjects were suggested: Pain, traumatic memories, and the dental professional. It was proposed that for some traumatized individuals, these subjects hold the

agentic capacity to produce trauma-reactions that are deeply undesirable, debilitating, and an impediment for recovery.

Dental treatment involves a risk for some degree of pain or discomfort. Informants disclosed that sudden pain, or the expectation of pain, during dental treatment often gave rise to bodily or mental reactions related to their traumatic experiences. Similarly, a study of sexual-abuse survivors described that stimuli in the dental setting, e.g. pain, that resembled previous trauma exposure held the potential to trigger anxiety reactions (Fredriksen *et al.,* 2020). In the present study, besides pain, trauma memories stood out as a strong subject – memories which could be triggered by different elements or situations before, during, or after dental treatment, dependent on the individual experiences of the dental patient. The potential of trauma memories to trigger uncontrollable physical and psychological reactions in torture victims were also described by Taylor *et al.* (2013).

The third, and perhaps superior subject, given the position to bring about both pain and traumatic memories, was the dental professional. Historically, there is evidence of dentists participating in torture (Speers et al., 2008). Moreover, several characteristics of the dental professional may appear as triggering, such as resemblance to previous negative others, clinical clothing, behavioral aspects, the potential to "do harm", and the power dynamics in the clinical situation. As negative experiences in the dental setting are described as a strong risk factor for developing dental anxiety (De Jongh *et al.,* 2006; Humphris & King, 2011), it is not surprising that torture victims may attribute some of their distress to the dental practitioner.

Traumatic reactions are often described as more exhausting than the trauma itself. Whereas the trauma, in this case the torture experiences, have stopped at some point, trauma reactions such as flashbacks may come back to haunt the victim at any time, night or day (van der Kolk, 2014). This may help explain why seeking and undergoing dental treatment may be extremely demanding and debilitating to some torture survivors. To receive dental treatment, they have to consciously surrender some of their agency. Thus, many informants explain how they just suffer through it, placing themselves at risk for traumatic reactions. The only alternative option, the informants stated, was to refrain from dental treatment, which from the quantitative results seemed to be more common in torture victims than in

other refugees. Avoidance reduces the temporary relief, but postpones and potentially exacerbates the dental problems. Avoidance of dental care is common in patients with dental anxiety (Öst & Skaret, 2013), and has also been reported in victims of sexual violence (Larijani & Guggisberg, 2015).

Bearing in mind the social and material dynamics of the triggering process, it was aimed to explore and present possible intervention strategies and treatment guidelines that might mitigate the risk for setting in motion trauma reactions in torture victims during dental visits. To facilitate increased agency, i.e. to reduce the patients' sense of objectification was pervasive. Thus, a robust therapeutic relationship, patient control, and feeling of safety stood out as basic needs. This was not surprising, considering that feeling safe with other people has been proposed to be the most important aspect of mental health (van der Kolk, 2014). Moreover, lack of control has been identified as a primary concern for patients with severe dental anxiety (Milgrom *et al.,* 2009). Armfield *et al.* (2008) summarized that affording dental patients with a sense of control, as well as freedom from pain and discomfort could limit dental fear and help manage it. This may be especially important in traumatized individuals, as a pervasive sense of unpredictability and uncontrollability is a common consequence of traumatic stress (Başoğlu, 2007). Van Rosmalen-Nooijens *et al.* (2017) highlighted control, safety, and trust as s vital needs in a qualitative study of health care provision to young adults exposed to family violence. Van der Kolk (2014) claims that to be able to help traumatized patients, our first priority must be to "move the patients out of fight or flight states, reorganize their perception of danger and manage relationships".

Increasing the patients' sense of control is an essential element in cognitive behavior therapy (CBT) which is the most widely used approach to treating dental anxiety (Öst & Skaret, 2013). However, in treatment of PTSD, "talk therapies" such as CBT have shown disappointing results (van der Kolk, 2014). Van der Kolk (2014) argues that even though also trauma survivors may have irrational thoughts that may be challenged through CBT, their reactions are often in the form of cognitive flashbacks that cannot be argued with. In line with van der Kolk (2014) we argue that the results of the present study indicate that CBT is not always a useful approach to treating torture exposed dental patients. Perhaps the main focus should rather be on adaption and facilitation to enhance the fundamental needs of control, safety, and a robust therapeutic relationship.

From the analysis of the qualitative data, factors that emerged as essential influencers of sense of control, feeling of safety, and a trusting patient-dentist relationship, sense of control were presented under four subthemes: 1) Fear that the dentist does not know and understand, 2) Distressful experience of time and pace, 3) The anxiety of surprise, and 4) The horror of losing overview.

It stood out as very important to the informants that the dental professionals had knowledge and understanding of their situation. Their fear that the dentist does not know and understand relates to both knowledge about torture in general, about trauma informed care (TIC), and about the specific patient. When the torture victims are refugees it also involves cultural awareness. Refugee patients are not always comfortable initiating conversation on all medical topics (Crosby, 2013), and Keller *et al*. (2014) emphasized that dental professionals working with torture victims need to work hard to earn their patients' trust.

However important that the dental care workers were aware of their patients' previous exposure to torture, talking about their experiences may be re-traumatizing. In line with the principles of TIC (Bath, 2008), we argue that it is sufficient that the dental professionals are aware that a patient is a survivor of torture. They do not need to know the details of the patient's trauma experiences as long as any need for facilitation is given due consideration. It has been suggested that, seeing as undergoing dental treatment is sensitive to a large part of the general population, a trauma sensitive approach may well be applied to all dental patients (Kranstad *et al.*, 2020).

Delays or the perception than the dentist was working too fast seemed to have a disturbing effect on the informants' sense of agency. Both these aspects of time and pace may signal that the patient is not a priority, whereas high tempo may have the additional effect of accentuating objectification. Torture victims' concerns with high work speed in dentistry has to our knowledge not been addressed explicitly in previous literature. Its consequences, objectification, and the feeling of being unimportant, are however closely related to need for control and a safe therapeutic relationship. In van Rosmalen-Nooijens *et al.*'s study (2017) traumatized individuals expressed a need for safety and a trusting relationship to be able to surrender to the control of the health care worker. Issues with prolonged waiting time, on

the other hand, are well known in research on torture victims, explained by the parallels to the unpredictability of the experienced torture (Başoğlu, 2009).

Being exposed to surprises may also bare resemblance to the torture situation. However, what appears as a surprise is depending on the experiences of the patients. Therefore, knowing the patient – establishing a thorough report and exploring individual triggers – seems to be of utter importance also with respect to avoiding negative surprises. Avoiding surprises in dental care has been emphasized as critical also in a study of sexual abuse-survivors (Fredriksen *et al.*, 2020).

Equally important, and partly related to avoiding surprises, was to maintain and facilitate the patients' overview of the entire dental session. To provide overview entails both visibility and predictability. The patient's need to know what is going on and what is going to happen next, needs that were also emphasized by the informants in van Rosmalen-Nooijens *et al.*'s study (2017).

7. Conclusions and implications

Refugees, and especially refugee survivors of torture often suffer from oral health problems with potentially grave and debilitating physical and psychological implications. Oral health status in refugees is generally poor, and oral health challenges have a considerable impact on quality of life. It is, however, in most cases possible to restore the dentition on condition that treatment is provided in due time. Newly arrived refugees are often preoccupied with the resettlement-process, and oral health is not a priority. Thus oral health should be included in refugee health programs.

A significant proportion of refugees have been subjected to torture, and prevalence of torture involving mouth or teeth is about one third. This must be taken into consideration when providing health care to torture survivors. All health personnel, including dentists, who work with torture survivors should know and understand the sequelae of torture. They should be prepared to identify symptoms and signs and have the skills to build a trustful treatment relation. The results of this thesis support the hypothesis that torture victims are more prone to dental anxiety, and that torture victims with PTSD-symptoms are particularly vulnerable. Dental health personnel should be able to recognize PTSD-symptoms and be aware that such symptoms are often accompanied by severe forms of dental fear and avoidance behavior. The other way around, dental workers should also be aware that patients presenting with severe dental anxiety may be victims of trauma in which trauma reactions may be triggered by elements in the dental setting.

Undergoing dental treatment entails handing over control to others, and thereby being suspended temporarily in an objectified position. Thus, to facilitate dental treatment for torture victims, the dental professional needs to work towards increasing the patients perceived control – and hence reducing the agency of the perceived subjects, of which we have proposed three main categories: Pain, traumatic memories, and the dental professional. Four themes stood out as especially important to help torture exposed dental patients tolerate dental treatment: 1) The dental professional needs to have knowledge about basic psychology, the consequences of torture, cultural differences, and trauma informed care (TIC), and be conscious that the patient is a torture survivor, 2) Acknowledge the negative impact of hurry and delays, 3) Avoid surprises, which involves that triggers must

be explored individually, and 4) Provide overview with respect to both visibility and predictability.

We argue that interdisciplinary collaboration is of utmost importance. Torture survivors prefer the dentist to know about their experiences but find it difficult to tell. It would be an advantage if this information could be passed on from e.g. psychologists and medical doctors. Furthermore, all health personnel should be encouraged to ask their patients about oral health, and oral screening and referral for dental treatment should be included in the primary health care for refugees.

Hopefully, the results of this study will help dental professionals, and other professionals working with torture victims, understand patient reactions and improve treatment outcomes. Moreover, countries that have signed the UN Convention Against Torture (UN 1984) have agreed to provide opportunities for rehabilitation and redress for torture survivors. Thus, a first step is to identify the concerned individuals. What has happened may never be undone. But it is our duty as health professionals to contribute to dealing with it. The results of this study may increase the participation and involvement of Norwegian dental health personnel in the process of identification of torture survivors and documentation of torture. The results may provide a baseline for the planning and evaluation of systemic oral health programs towards torture survivors.

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Appendix

Appendix 1: Oral health measures

Klinisk undersøkelse (utføres av tannlege)

Tannstatus:

D = ”Decayed” tann
F = Fylt tann
M = Manglende tann
X = Tann mobil grad 2 eller 3

Tann	D	F	M	X
11				
12				
13				
14				
15				
16				
17				

Tann	D	F	M	X
21				
22				
23				
24				
25				
26				
27				

Tann	D	F	M	X
41				
42				
43				
44				
45				
46				
47				

Tann	D	F	M	X
31				
32				
33				
34				
35				
36				
37				

Tannproteser: □ Hel over

□ Hel under

□ Partiell over

□ Partiell under

Oral patologi: □ Nei

□ Ja - Beskrives:_____

Umiddelbart behandlingsbehov:

□ Asymptomatisk aktiv karies

□ Aktiv periodontal sykdom

□ Frakturerte tenner

□ Tannproteser som trenger reparasjon

Akutt behandlingsbehov:

□ Smerter

□ Risiko for alvorlig infeksjon

□ Mistanke om malign lesjon

Plakkindex:

0 = Plakkfritt

1 = Plakkfilm langs gingivalranden som ikke kan ses med det blotte øye, men som kan oppdages ved å føre en tannpirker langs gingivalranden.

2 = Moderat mengde plakk i tannkjøttslommen, på gingivalranden og/eller på tilgrensende tannflate. Kan ses med det blotte øyet.

3 = Mengder myk materie i tannkjøttslommen og/eller på tann og gingivalrand.

Seks indextenner skåres. Ingen erstatning ved manglende indextann.

Tann / flate	Mesial	Distal	Bukkal	Ling / pal
16				
21				
24				
36				
41				
44				

Ginigivalindex:

0 = Ingen inflammasjon

1 = Mild inflammasjon; Lett fargeforandring, lett ødem, ingen BOP (bleeding on probing).

2 = Moderat inflammasjon; Moderat rødhet og ødem, BOP.

3 = Kraftig inflammasjon; Markert rødhet og hypertrofi, ulcerasjon og tendens til spontan blødning.

Seks indextenner scores. Ingen erstatning ved manglende indextann.

Tann / flate	Mesial	Distal	Bukkal	Ling / pal
16				
21				
24				
36				
41				
44				

Appendix 2: Questionnaire

Questionnaire - Baseline

Perceived oral health and dental care habits:

1. How would you describe the health of your teeth or mouth?
   - □ Excellent
   - □ Very good
   - □ Good
   - □ Fair
   - □ Poor

2. Do you suffer from toothache or other pain in the mouth?
   - □ Extremely
   - □ Quite a bit
   - □ A little
   - □ Not at all

3. Do you have any mobile teeth or missing teeth?
   - □ Yes □ No

4. Are you satisfied with your own teeth?
   - □ Yes □ No

5. Do you think you have any untreated dental conditions?
   - □ Yes □ No

6. How do you clean your teeth? _____

7. How often do you clean your teeth? _____times a day.

Utilization of dental health services

Have you ever been to a dental consultation (seen a dentist)?

□ Yes □ No

If YES:

- How long ago? _____years ago
- Where (which country)? _____

- What kind of treatment did you get?

  □ Planned treatment

  □ Emergency treatment

Follow-up question for those who have only seen a dentist for emergency treatment, or have never seen a dentist:

- What are your reasons for not receiving regular dental care?

  □ I don't think I need dental treatment

  □ It's expensive

  □ I'm afraid of seeing a dentist (dental fear)

  □ It's difficult to understand the Norwegian system

  □ Language difficulties

  □ Haven't had the time or energy to prioritize it

  □ Other reasons _____

Oral health related quality of life – OIDP:

OIDP

Now some questions concerning how your oral health condition may affect your daily life.

First we would like you to answer some questions concerning different problems with your teeth or dentures.

1a. During the last 6 months, how often have problems with your teeth or dentures caused any difficulty with eating and enjoying food?

Every day or almost every day..... 1☐

Once or twice a day ……..…… 2☐

Once or twice a month……..…… 3☐

Less than once a month……. 4☐

Never…….…… 5☐

1b. During the last 6 months, how often have problems with your teeth or dentures caused any difficulty with speaking and pronouncing clearly?

Every day or almost every day..... 1☐

Once or twice a day ……..…… 2☐

Once or twice a month……..…… 3☐

Less than once a month……. 4☐

Never…….…… 5☐

1c. During the last 6 months, how often have problems with your teeth or dentures caused any difficulty with tooth cleaning?

Every day or almost every day..... 1☐

Once or twice a day ……..…… 2☐

Once or twice a month……..…… 3☐

Less than once a month……. 4☐

Never…….…… 5☐

1d. During the last 6 months, how often have problems with your teeth or dentures caused any difficulty with sleep and relaxation?

Every day or almost every day..... 1☐

Once or twice a day ..... 2☐

Once or twice a month..... 3☐

Less than once a month..... 4☐

Never..... 5☐

1e. During the last 6 months, how often have problems with your teeth or dentures caused any difficulty with smiling and showing teeth without being embarrassed?

Every day or almost every day..... 1☐

Once or twice a day ..... 2☐

Once or twice a month..... 3☐

Less than once a month..... 4☐

Never..... 5☐

1f. During the last 6 months, how often have problems with your teeth or dentures caused any difficulty with being emotionally stable?

Every day or almost every day..... 1☐

Once or twice a day ..... 2☐

Once or twice a month..... 3☐

Less than once a month..... 4☐

Never..... 5☐

1g. During the last 6 months, how often have problems with your teeth or dentures caused any difficulty with being sociable (enjoying being with other people)?

Every day or almost every day..... 1☐

Once or twice a day ..... 2☐

Once or twice a month..... 3☐

Less than once a month..... 4☐

Never..... 5☐

1h. During the last 6 months, how often have problems with your teeth or dentures caused any difficulty with performing daily work / daily chores?

Every day or almost every day..... 1☐

Once or twice a day ……..…… 2☐

Once or twice a month……..…… 3☐

Less than once a month……. 4☐

Never…… 5☐

Dental fear – MDAS (Modified Dental Anxiety Scale)

- If you went to the dentist tomorrow, how would you feel?
  - ☐ Not anxious (1)
  - ☐ Slightly anxious (2)
  - ☐ Fairly anxious (3)
  - ☐ Very anxious (4)
  - ☐ Extremely anxious (5)
- If you were sitting in the waiting room, waiting for treatment, how would you feel?
  - ☐ Not anxious (1)
  - ☐ Slightly anxious (2)
  - ☐ Fairly anxious (3)
  - ☐ Very anxious (4)
  - ☐ Extremely anxious (5)
- If you were about to have a tooth drilled, how would you feel?
  - ☐ Not anxious (1)
  - ☐ Slightly anxious (2)
  - ☐ Fairly anxious (3)
  - ☐ Very anxious (4)
  - ☐ Extremely anxious (5)

- If you were about to have your teeth scaled and polished, how would you feel?
  - ☐ Not anxious (1)
  - ☐ Slightly anxious (2)
  - ☐ Fairly anxious (3)
  - ☐ Very anxious (4)
  - ☐ Extremely anxious (5)

- If you were about to have a local anesthetic injection in your gum, how would you feel?
  - ☐ Not anxious (1)
  - ☐ Slightly anxious (2)
  - ☐ Fairly anxious (3)
  - ☐ Very anxious (4)
  - ☐ Extremely anxious (5)

Torture experience and PTDS-symptoms

PTSS 16 - HARVARD TRAUMA QUESTIONNAIRE

The following are symptoms that people sometimes have after experiencing hurtful or terrifying events in their lives. Please read each one carefully and decide how much the symptoms bothered you <u>in the past week</u>.

		(1) **Not at all**	**(2)** **A little**	**(3)** **Quite a bit**	**(4)** **Extremely**
1.	Recurrent thoughts or memories of the most hurtful or terrifying events				
2.	Feeling as though the event is happening again				
3.	Recurrent nightmares				
4.	Feeling detached or withdrawn from people				
		1)	**(2)**	**(3)**	**(4)**

		Not at all	A little	Quite a bit	Extremely
5.	Unable to feel emotions				
6.	Feeling jumpy, easily startled				
7.	Difficulty concentrating				
8.	Trouble sleeping				
9.	Feeling on guard				
10.	Feeling irritable or having outbursts of anger				
11.	Avoiding activities that remind you of the traumatic or hurtful event				
12.	Inability to remember parts of the most hurtful or traumatic events				
13.	Less interest in daily activities				
14.	Feeling as if you don't have a future				
15.	Avoiding thoughts or feelings associated with the traumatic or hurtful events				
16.	Sudden emotional or physical reaction when reminded of the most hurtful or traumatic events				

Please answer the following questions after filling in the PTSS-16:

Have you been exposed to torture or other systematic abuse?

□ Yes □ No

If YES:

- Have you experienced violence directed towards the
  - face? □ Yes □ No
  - mouth? □ Yes □ No
  - teeth? □ Yes □ No

Do you feel the need to talk more with somebody about this? □ Yes □ No

Appendix 3: Interview guide

Torture victims and dental treatment in Norway. A qualitative study.

INTERVJUGUIDE

FORVENTNINGER: Hvordan ønsker du å bli møtt i tannbehandlingssituasjonen, og hvilke forventinger har du til tannhelse/munnhelse? Eksempelspørsmål:

- Kan du begynne med å fortelle meg litt om hvordan du opplever et typisk tannlegebesøk?
- Hvordan ønsker du at tannhelsepersonellet skal møte deg når du kommer til behandling?
- Hvor mye vil du at tannlegen skal vite om torturerfaringene dine?
- Hvilken behandling er viktig for deg? Oppfølging: Fast/avtagbar protetikk, løse tenner, smerte, manglende tenner, smil, blødning
- Kan du tenkte deg tilstander i munnen som ville påvirke livet ditt generelt?
- Har du noen erfaringer fra tidligere behandling som du kan fortelle om?
- Hva / hvor mye ønsker du å vite om behandlingen som skal gjøres?
- Hvem skal være med på å bestemme hvilken behandling som skal gjøres?
- Har du noen tanker omkring det at du og tannlegen kanskje har forskjellig kulturell bakgrunn?
- Har du opplevd situasjoner du synes det er vanskelig å sette ord på?

TILLIT: Hva forstår du med "en god tannlege"? Eksempelspørsmål:

- Hva tenker du er en bra tannlege?
- Hva avgjør om du kan stole på en tannlege eller ikke?
- Hvordan bedømmer du faglig dyktighet?
- Hva er viktig: Vennlighet? Omsorg/emptati? Informativ? Humor?
- Er det viktig at tannlegen har kunnskap om ulike kulturer og innsikt/forståelse/respekt for kulturforskjeller?
- Er tannlegens kulturelle/etniske bakgrunn av betydning for deg?

TRYGGHET: Hva gjør deg trygg i tannbehandlingssituasjonen? Eksempelspørsmål:

- Tenk tilbake på forrige gang du fikk tannbehandling. Følte du deg trygg?
- Evt: Hva var det som gjorde at du følte deg trygg?
- Kan du tenke deg ting tannlegen kunne gjøre som ville få deg til å bli utrygg?

<u>FRYKT / ANGST:</u> Er det noe som ville gjøre deg engstelig/redd når du er hos tannlegen? Eksempelspørsmål:

- Tenk på tannbehandling du har opplevd. Har du opplevd å være engstelig eller redd?
- Evt: Kan du si litt mer om hva som fikk deg til å føle det sånn?
- Er det noe du opplever hos tannlegen som får deg til å tenke på, eller gjenoppleve vanskelige ting du har opplevd i andre situasjoner?
- Har du opplevd å utsette tannlegebesøk fordi du har vært redd?

<u>TILFREDSHET:</u> Hva skal til for at du blir fornøyd med behandlingen? Eksempelspørsmål:

- Har du vært fornøyd med tannbehandlingen du har fått?
- Evt. Kan du si litt mer om…
- Har du opplevd å være misfornøyd?

<u>SAMSPILL:</u> Hva tenker du om fordelingen av oppgaver og ansvar mellom deg og tannlegen?

- Tror du at det er noe du selv kunne gjøre for at tannlegebesøket skal gå så greit som mulig?
- Hva bør tannlegen gjøre?
- Stikkord: Informasjon, tilrettelegging, forebygging, pasientens ansvar for oppfølging, «shared decision making»…

Eksempler på oppfølgingsspørsmål til bruk under alle punktene:

- Kan du fortelle meg mer om….?
- Har du flere eksempler på dette….?
- Hvordan fikk dette deg til å føle….?
- Hvordan reagerte du fysisk på dette….?
- Hvordan reagerte du følelsesmessig på dette…?
- Kan du huske en gang når….?
- Kan du beskrive, så detaljert som mulig, hvordan…….var for deg?
- Er……en riktig beskrivelse av det du akkurat har fortalt meg?
- Jeg vil gjerne være sikker på at jeg har forstått deg riktig. Mente du at…….?

Requesting participation in the research project:

"Oral health among refugees, with emphasis on refugees with torture experience"

Background and purpose
We would like to ask you to participate in a study aiming to survey dental health in a group of refugees in Norway. Norwegian Health Authorities are developing a dental health program for torture victims, victims of abuse and individuals suffering from dental fear (the T.O.O.-project). This study aims to increase our knowledge about oral health and dental treatment needs among refugees from countries where torture is known to be practiced. We want to study prevalence of dental fear in this group, and any correlation between dental fear and torture experience. A follow-up after 1-2 years are also planned.

The study is part of the PhD-project of dentist Ann Catrin Høyvik, Dental Faculty, University of Oslo (UiO). Supervisors are Tiril Willumsen, professor at the Dental Faculty, UiO and Dr of medicine Birgit Lie, RVTS-south (Regional Competence Centre about abuse, traumatic stress and suicide prevention). The study is also done in cooperation with the Dental Health Services Competence Center (TKØ).

What is the study about?
Dentist Ann Catrin Høyvik will come to you at the reception center, or to at local health facility if you do no longer live in a reception center. Your mouth and teeth will be examined without the use of sharp instruments, and a photo of your teeth will be taken. Then you will be asked to answer some questions about dental health, experience with dental treatment and about whether or not you have experienced torture. You may be contacted again after 1-2 years to repeat the survey.

Possible advantages and disadvantages
The benefit of being in this study is that you get a free dental examination. If it turns out that you are in need of dental treatment, you will receive guidance on how to arrange this. The downside is that we will occupy 45 minutes of your time. In the long term, taking part in this project may involve benefits for people in your situation, in that we learn more about how to customize the public dental health services.

What happens to the information we gain about you?
The registered information about you will only be used as described in the aim of the study. All collected data will be de-identified. This means they will be registered without name or birth date or other details that would make it possible to recognize the participant. A code will link you to your data through a list of names, making it possible for us to contact you again for the follow-up. Only authorized personell will have access to the list of names. It will not be possible to identify you from the results of the study when published.

Voluntary participation
Participation in the study is voluntary. You can opt out at any time without giving a reason. This will not have further consequences for you. If you wish to participate, you sign the consent form on the last page. If you agree now, you still have the right to withdraw your consent later without it affecting you in any way. If you want to withdraw later, or if you have questions, feel free to contact professor Tiril Willumsen or dentist Ann Catrin Høyvik on phone nr 970 770 17.

Further informaion about the study is found in section A – *Detailed explanation of what the study is about.*
Further information about insurance and protection of privacy is found in section B – *Privacy policy, economy and insurance.*

Consent form is found after section B.

Section A – Detailed explanation of what the study is about

Criteria for participation:
We wish to include asylum seekers that have been granted permanent recidency in Norway, who still lives in reception centers, and resettlement refugees in the same area. Because of the need of interpreters, we wish to include people who speak certain languages. We also place emphasis on recruiting from countries where torture is known to be practised. We will only include people who can give consent on their own behalf, and we are not interested in persons 18 years old or younger. These are inluded in the public dental services.

Bacground information about the study:
In 2012 Norwegian Health Authorities increased focus on developing and establishing a dental healt plan for torture victims, victims of abuse and individuals suffering from dental fear (The T.O.O.-project). Both phd-fellow Ann Catrin Høyvik and her supervisors, Tiril Willumsen and Birgit Lie take part in the T.O.O.-project. Little research is done on the relationship between torture experience and dental treatment, and more knowledge is needed. Also, there is a need to survey oral health and dental treatment need among refugees in Norway in general.

What happens if you choose not to take part in the study?
If you choose not to participate, you miss the extra free dental examination. You still have rights (along with the participants) to apply to UDI (if you live in a reception center) or NAV (if you are settled) for dental treatment. Employees at the reception center, or the refugee consultant may help you with this.

Examinations and questionnaires
Dentist Ann Catrin Høyvik will come to your reception center, or to a local health clinic if you are settled. She will examine your mouth and teeth using mirror, gauze and a blunt toothpick. No sharp instruments. A photo showing only mouth and teeth will be taken. What we are looking for is: Number of filled teeth, number of decayed teeth, missing teeth, loose teeth, gum disease, dental plaque and other disease of the mouth..

Then you will be asked questions about how you perceive your oral health, dental health habits, experience with use of dental services, oral healt related quality of life, dental fear, torture experience and any psychological symptoms of perceived stress (Post Traumatic Stress Disorder – PTSD).
The dentist will guide you through the questionnaire, with the help of an interpreter when necessary.

Participation will take about 45 minutes. Some of the participants may be contacted again after 1-2 years to repeat the survey.

Advantages and disadvantages
The benefit of being in this study is that you get a free dental examination. The dentist will tell you if she finds disease in mouth or teeth. If it turns out that you are in need of dental treatment, you will receive guidance on how to arrange this. If you have dental fear or if you need to talk to somebody about torture experience, we can refer you to an appropriate specialist. The downside is that we will occupy 45 minutes of your time. In the long term, taking part in this project may involve benefits for people in your situation, in that we learn more about how to customize the public dental health services.

Your responsibility
Your responsibility is to show up on time to your appointment with the dentist, and to answer all questions truthfully.

Voluntary participation
Participation in the study is voluntary. You can opt out at any time without giving a reason. This will not have further consequences for you. You will be informet as soon as possible if new information becomes available, that may affect you willingness to participate in the study. You will also be informed if situations/decisions arise that will necessitate termination of your participation in the study earlier than planned.

Section B – Privacy policy, economy and insurance

Protection of privacy
Registered information about you will be findings from the clinical examination, phothograph showing only mouth and teeth and your answers to the questionnaire. All collected data will be handled without name, date of birth or other identifiable details. A code will link you to your data through a list of names, making it possible for us to contact you again for the follow-up. Only authorized personell will have access to the list of names, and be able to find you again later. Anyone gaining access have signed a confidentiality agreement. It will not be possible to identify you from the results of the study when published.

The Faculty of Dentistry at the University of Oslo, by Chief executive officer, is responsible for data managing.

Right to access to information about you
If you agree to participate in the study, you have the right to have access to the data that is registered about you. Further, you have the right to have any errors in the information corrected. If you withdraw from the study, you may demand the registered information deleted, unless they are already part of data-analyses or included in scientific publications.

Economy
The study is financed by research funds from the University of Oslo.

Insurance
The Patient Protection Law applies.

Information about the outcome of the study
As participant in the study you have the right to obtain information about the outcome.

Consent form

I agree to participate in the study

”Oral health among refugees, with emphasis on refugees with torture experience”

(Signed by participant, date)

I confirm that I have provided information about the study

(Signed, role in the study, date)

Requesting participation in the research project

"Torture victims and dental treatment in Norway – a qualitative study"

Background and purpose
We would like to ask you to participate in a study aiming to gain understanding of what torture survivors perceive to be the best way to be met by the dental team in the dental treatment situation. To many victims of torture, it is important to have their teeth repaired to feel as a whole person again. But to some victims of psychological trauma, receiving dental treatment may be a challenge. Through this study, we want to interview torture survivors with dental treatment experience from Norway. The aim is to give dental health personnel increased knowledge about how to facilitate dental treatment to become a part of the total rehabilitation instead of re-traumatizing the patient.

The study is part of dentist Ann Catrin Høyvik's PhD-project at the University of Oslo (UiO), Faculty of dentistry. Supervisors are professor Tiril Willumsen, UiO, Faculty of dentistry, Dr med Birgit Lie, Sørlandet Hospital and RVTS-south (Regional center on violence, traumatic stress and suicide prevention) and Per Kristian Hilden, researcher at NKVTS (Norwegian centre for violence and traumatic stress studies) and associate professor at the medical faculty, UiO. The study, which is financed by research funds from the UiO, is also a collaborative project with the Norwegian public dental health services, the TOO-project (Dental treatment for persons with history of torture, abuse or dental phobia).

What is the study about?
Ann Catrin Høyvik would like to interview you in a neutral place that you may take part in choosing. The interview will be about your expectations regarding dental health and dental health personnel, what you think describes "a good dentist", what makes you feel safe and comfortable in the dental treatment situation, or what possibly makes you feel anxious, what is required for you to be satisfied with the treatment, and what do you think about the distribution of responsibility between yourself and the dentist. The interview is estimated to take one hour, but it may not take that long. If needed we may telephone you once after the interview with follow up questions.

Possible advantages and disadvantages
By taking part in this study, your experiences will contribute to new knowledge that may help improve the dental health services to survivors of torture, and thus help others in your situation. If you have dental health problems, or need to talk to a professional about your torture experiences, you may receive help through the TOO-project. Travel expenses and time spent will be compensated with up to kr 500,-

What happens to the information we gain about you?
The registered information about you will only be used as described in the aim of the study. All collected data will be de-identified. This means that they will be registered without name or birth date or other details that would make it possible to recognize the participant. A code will link you to the information given in the interview. Only authorized personnel will have access to the code and be able to contact you again. It will not be possible to identify you from the results of the study when published. As a participant you have the right to obtain information of the result of the study.

The Faculty of Dentistry at the UiO, by Chief executive officer, is responsible for data managing.

Voluntary participation
Participation in the study is voluntary. You can opt out at any time without giving a reason. This will not have further consequences for you. If you wish to participate, you sign the consent form below. If you agree now, you still have the right to withdraw your consent later without it affecting you in any way.

Right to access to information about you
If you agree to participate in the study, you have the right to have access to the data that is registered about you. If you withdraw from the study, you may demand the registered information deleted, unless they are already part of data-analyses or included in scientific publications.

If you have questions later, or want to withdraw from the study, feel free to contact professor Tiril Willumsen or dentist Ann Catrin Høyvik on phone nr 970 770 17.

Consent form

I agree to participate in the study

(Signed by participant, date)

I confirm that I have provided information about the study

(Signed, role in the study, date)

Paper I

Oral Health Challenges in Refugees from the Middle East and Africa: A Comparative Study

Ann C. Høyvik, Birgit Lie, Andrej M. Grjibovski & Tiril Willumsen

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ORIGINAL PAPER

Oral Health Challenges in Refugees from the Middle East and Africa: A Comparative Study

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Abstract
The aim was to explore and compare oral health and need for dental treatment in newly arrived refugees from the Middle East and Africa to Norway. Oral examination and structured interviews were performed with attending interpreters. Associations between origin and measures for oral health were studied with multiple linear regression. Half of the refugees (n = 132) reported oral impacts on daily performances (OIDP) and mean number of decayed teeth (DT) was 4.3 (SD 3.5). Refugees from the Middle East had more DT (1.38, p = 0.044), higher sum of decayed, missing and filled teeth (DMFT) (3.93, p = 0.001) and lower OIDP-score (− 3.72, p = 0.026) than refugees from Africa. Refugee oral health is generally poor, with more extensive challenges in refugees from the Middle East. However, few missing teeth, and manageable caries-gradient at the time of registration indicate that most refugees have the prerequisites for a good dentition, provided they get the necessary treatment.

Keywords Oral health · Refugees · Decayed, missing and filled teeth · Quality of life

Introduction

Europe has experienced a historical influx of refugees and asylum seekers driven by conflicts, violence and poverty in African and Middle Eastern countries [1]. The receiving and integrating of these new citizens entails complex social and economic challenges, and new demands are placed on the existing health-care systems.

Oral health is often under-communicated or neglected in general and specialized health care services, despite its clear impact on quality of life [2]. It is not represented in the dominating Norwegian hospital-journal [3], and to our knowledge Canada is the only country that has developed specific guidelines for oral screening of refugees and immigrants [4].

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Oral pain, infections or missing teeth may have serious physical, social and psychological consequences and even affect the ability to speak [2], which is important when learning a new language. A survey of Syrian refugees in Jordan revealed that 40% of the respondents reported need for dental services [5], and in a refugee camp in Brussels, dental caries was the second most common primary diagnosis [6]. Prior American and Australian research indicated considerably higher dental treatment needs in newly arrived refugees compared to the general population [7–9]. Conclusions from these studies suggested an urgent need for the inclusion of refugees in targeted dental services, and resettlement programmes should include dental screening, treatment and oral health education to prevent a further decline in dental health status [8, 9]. A recent pilot study from Finland demonstrated dental treatment need in most asylum seekers and two-thirds of other immigrants. Access to dental services was considered a major challenge [10].

A series of factors are associated with poor oral health conditions in refugees. There is limited access to dental care, both in native countries and during migration [7, 11]. Dental clinics may be destroyed or closed during conflicts, which according to Saltaji [12] was seen recently in Syria, where many dental clinics were affected, and health personnel fled the country. Health clinics in refugee camps have limited resources for the treatment of dental diseases [5], and when

settling in Western countries, some migrant groups are introduced to more high-sugar foods than they are accustomed to [13, 14]. Refugees in the process of resettlement may have more pressing problems than oral health, and previous research demonstrated a tendency to under-utilize dental services and seek emergency dental treatment only [7–9, 15]. Other important barriers to the seeking of dental care are limited income, language difficulties, fear, education and cultural barriers, such as differences in perceptions of oral health, alternative beliefs about dental care, and unfamiliarity with health-care services in a foreign country [7, 8, 10].

Little emphasis was placed on oral health research in adult refugees in European countries during the last 25 years [11]. Refugee populations are fluctuating and exhibit considerable variations in dental treatment experience and risks for oral disease. Oral health challenges are not homogenous across African and Middle Eastern countries. Despite a high rate of untreated caries in general, caries prevalence is lower in most African countries than in more industrialized countries in the Middle East [16]. Thus, it should be of interest to study whether this difference is reflected in refugee oral health. To consider calls for action in European dental health-services, there is a need to investigate the expected burden of oral health problems associated with the current refugee influx.

The aim of the study was to explore oral health and need for dental treatment in newly arrived refugees from Africa and the Middle East. The secondary aim was to test the hypothesis that there are differences in oral health-challenges between refugees from Africa and the Middle East.

Methods

Participants and Data Collection

The sample consisted of individuals with refugee status in Norway, both resettlement refugees and asylum seekers granted permanent residency. Data collection was performed between December 2013 and June 2015. On arrival in Norway, the Norwegian Directorate of Immigration (UDI) distribute all refugees randomly to reception centers throughout the country [17]. All regular centres (8) within commuting-distance to Oslo were invited to the study, and agreed to participate. At the time of data-collection, few refugees from outside Africa or the Middle East were granted residency in Norway [18]. Thus, adult refugee residents from Africa or the Middle East were invited to the study. Exclusion criteria were (i) age 18 years or younger, (ii) living time in Norway more than 2 years, (iii) not fluent in one of the five most common languages currently spoken by refugees in Norway (Arabic, Sorani, Tigrinya, Amharic and Somali), or Norwegian or English. Data collection was planned on days where the refugees had no activities outside the reception centers. With three exceptions, all invited refugees who were in the area on the planned days of data collection agreed to take part in the study. In total, 132 refugees gave written informed consent to participate.

Sample size was estimated from comparison of caries prevalence in refugees from Africa and the Middle East. Standard deviation (3.1 units) and clinical relevant difference (2 units) was retrieved from Davidson [9]. Significance level was set to 5%, power 90% and group-size ratio 2:1, with twice as many African refugees at the time of investigation. We calculated a need for at least 78 and 39 refugees from Africa and the Middle East respectively, which represents 2% of all refugees from the two areas [17].

Data collection included questionnaires and oral examination with attending interpreters, and was conducted in regular rooms at the reception centers. A trained dentist (the first author) performed all interviews and oral screening. The questionnaires were read loud and registered by the interviewer. The interpreters used written professional translations [19] of the interview guide to ensure equality in the translation process.

Oral examination was conducted according to methods described by Singh et al. [20]. The dentist used a penlight and headlight, disposable mouth mirror, disposable gloves and sterile gauze to inspect all quadrants of the mouth. Blunt toothpicks were used to record plaque and gingival indexes. Intra-oral photographs were taken for documentation, with consent from the subjects. Radiographs were not available.

Measures

Socio-demographic variables recorded were age, gender, educational level (Table 1), country of birth, and preferred language to discuss health issues.

Self-perceived oral health was explored by four questions. “How would you describe the health of your teeth or mouth?” (excellent/very good/good/fair/poor) was dichotomized into “good” (excellent/very good/good) and “not good” (fair/poor). “Do you think you have any untreated dental conditions?” and “Are you satisfied with your own teeth?” had the options “yes” or “no”. “Do you suffer from toothache or other pain in the mouth?” (not at all/a little/quite a bit/extremely) was dichotomized into “no problem with pain” (not at all/a little) and “regular oral pain” (quite a bit/extremely)”.

The oral impacts on daily performance (OIDP) instrument [21, 22] was used to measure oral health-related quality of life. The questionnaire contains eight questions (Table 2) about how often during the last 6 months, problems with an individual’s teeth or dentures caused any difficulty with the common daily performance of activities. Response alternatives and scores are: every day (1),

Table 1 Demographic characteristics of the study sample

	Total (n = 132)	Middle East[a] (n = 45)	Africa[b] (n = 87)	Test value (df)	p
Gender n (%)					
Male	94 (71.2)	36 (80.0)	58 (66.7)	2.57 (1)*	0.109*
Female	38 (28.8)	9 (20.0)	29 (33.3)		
Education n (%)					
No	14 (10.6)	5 (11.1)	9 (10.3)	13.57 (4)*	0.009*
1–7 years	24 (18.2)	6 (13.3)	18 (20.7)		
8–10 years	30 (22.7)	6 (13.3)	24 (27.6)		
11–13 years	41 (31.1)	13 (28.9)	28 (32.2)		
> 13 years	23 (17.4)	15 (33.4)	8 (9.2)		
Age					
Mean(SD)	31.8 (11.6)	34.8 (12.6)	30.3 (10.8)	2.17 (130)**	0.032**

*Calculated using Pearson's chi-squared test

**Calculated using unpaired t-test

[a]Syria (39), Iran (4), Iraq (1), Afghanistan (1)

[b]Eritrea (54), Somalia (24), Sudan (8), Nigeria (1)

Table 2 Self reported oral health and oral impacts on daily performances (OIDP)

	Total n = 132	Middle East n = 45	Africa n = 87	Test value (df)*	p*
"How would you describe the health of your teeth or mouth?" % "Not good"	63.6	71.1	59.8	1.65 (1)	0.199
"Do you think you have any untreated dental conditions?" % "Yes"	76.5	80.0	74.7	0.46 (1)	0.497
"Are you satisfied with your own teeth?" % "No"	50.8	64.4	43.7	5.12 (1)	**0.024**
"Do you suffer from toothache or other pain in the mouth?" % "Regular oral pain"	37.9	40.0	36.8	0.13 (1)	0.718
% Reporting problems once a week or more often with…due to problems with teeth or dentures (OIDP)					
…eating and enjoying food…	37.9	44.4	34.4	1.25 (1)	0.263
…speaking and pronouncing clearly…	10.6	15.5	8.0	1.76 (1)	0.184
…tooth cleaning…	31.8	35.5	29.9	0.44 (1)	0.507
…sleep and relaxation…	14.4	24.4	9.1	5.60 (1)	**0.018**
…smiling and showing teeth without being embarrassed…	21.2	28.9	17.2	2.41 (1)	0.121
…being emotionally stable…	12.9	20.0	9.1	3.09 (1)	0.079
…being sociable (enjoying being with other people)…	12.9	22.2	8.0	5.31 (1)	**0.021**
…performing daily work/daily chores…	11.4	17.7	8.0	2.79 (1)	0.095

Bold values indicate significance level 0.05

*Calculated using Pearson's chi-squared test

once-twice a week (2), once-twice a month (3), less than once a month (4), and never (5).

Utilization of dental services was measured asking "Have you ever in your life visited a dentist?" (yes/no). If yes: "Do you seek dentists for regular check-ups or only for emergency dental treatment?" Participants who had never seen a dentist, or only on emergency basis, were asked an open-ended question about why. Answers were categorized retrospectively ("Results" section). Participants also answered open-ended questions about dental cleaning habits (equipment used regularly), and frequency of oral cleaning (times per day).

Numbers of decayed (DT), filled (FT), and missing teeth (MT) were recorded. DT were defined according to Singh et al. [20] as 0.5 mm or more of tooth structure lost at the enamel surface and brown coloration of cavity walls. Decayed teeth with fillings were recorded only as DT, to enable calculation of sum of decayed, missing and filled teeth (DMFT). A probe was not used because of ethical considerations. Teeth with mobility > grade 1 were scored

as mobile. All signs of oral pathology were recorded and described as well as presence or absence and condition of dentures.

Analysis

Intra-examiner agreement was tested via patient examination at the Dental Faculty in Oslo and resulted in Cohen's Kappa of 0.91.

Statistical analyses were performed using SPSS 24.0 (Chicago, IL, USA). Differences between groups were tested using Pearson's chi-squared tests for categorical variables and unpaired t-tests for continuous variables. Associations between origin and DT, DMFT and OIDP sum-score were studied with multiple linear regression with adjustment for age, gender and education. Assumptions for linear regression models were checked and adequately met.

Ethics

The Norwegian Directorate of Immigration (UDI) and the Norwegian Ethics Committee approved the project (2013/1080/REK South-East A).

Results

Table 1 shows the demographics of the study sample, which consisted of 132 relatively young refugees (median age = 28.5) of which 71.2% were men. In both groups, approximately 10% were illiterate, whereas the percentage with a university degree was higher among refugees from the Middle East (33%) than from Africa (9%).

Half of the refugees (50.4%) reported one or more weekly oral impacts on daily performances. OIDP sum-score was 30.4 (SD 10.0) and 33.3 (SD 7.4) in Middle Eastern and African refugees respectively (p = 0.062). There were no significant gender differences in mean OIDP-scores.

Table 2 gives an overview of self-reported oral health and OIDP. Refugees from the Middle East were less satisfied with their teeth (p = 0.024), and expressed more trouble with sleep and relaxation (p = 0.018) and with taking part in social activities (p = 0021) due to oral health problems than refugees from Africa.

A total of 33.3% of participants had no previous experience with dental visits, 48.3% of Africans and 4.4% of refugees from the Middle East (p = 0.001). Of participants with dentist experience, 69.6% of Africans and 60.5% from the Middle East had only received emergency treatment (p = 0.368). Of the 108 refugees (81.8%) who claimed not to engage in regular dental visits, 42.9% of African participants reported "I don't think I need dental treatment" as a main reason, compared to 15.6% of participants from the Middle East (p = 0.007). Other prominent explanations were cost (Middle East: 68.8%, Africa: 34.2%, p = 0.001), problems with understanding the Norwegian dental care system (Middle East: 43.8%, Africa: 22.4%, p = 0.025), lack of time or energy to prioritize it (Middle East: 15.6%, Africa: 19.7%, p = 0.615), and language difficulties (Middle East 18.8%, Africa 9.2%, p = 0.164). Only 3% of the refugees reported dental fear as a reason for not seeking dental treatment.

Overall, 89.4% of the refugees had at least one carious tooth (median = 3.5). One or more mobile teeth (degree 2–3) were found in 36.4%, and signs of oral-pathological conditions in 9.8%. Only three participants had dentures, which were all in need of repair. No significant gender differences in dental status were found.

Table 3 presents DMFT-numbers, with comparison of refugees from Africa and the Middle East. Mean DT was high in both groups, although higher in refugees from the Middle East (p = 0.039), who also presented with higher mean FT (p = 0.001) and DMFT (p = 0.001). Total mean MT was 1.4.

Almost all participants (96.2%) used a toothbrush regularly, whereas few were familiar with floss /toothpicks (5.3%) or mouth-rinse (3.8%). Some of the refugees (6.1%) also used a stick-brush either solely or in addition to toothbrushing. With respect to dental care-equipment there were no significant differences between regions of origin, but oral cleaning at least once a day was significantly more common among African refugees (100%) than in refugees from the Middle East (86.7%) (p = 0.001). Brushing twice a day or more was reported by 63.7% (Middle East: 53.3%, Africa: 69.0%, p = 0.077). There were no significant gender differences.

Table 3 Mean numbers of decayed, missing and filled teeth and sum of decayed, missing and filled teeth (DMFT), overall and in refugees from the Middle East and Africa

	Total n = 132	Middle East n = 45	Africa n = 87	Test value (df)*	p*
Decayed teeth, mean (SD)	4.3 (3.5)	5.2 (4.2)	3.9 (2.9)	2.08 (130)	0.039
Missing teeth, mean (SD)	1.4 (2.4)	1.6 (3.4)	1.3 (1.7)	0.71 (130)	0.479
Filled teeth, mean (SD)	1.7 (3.4)	3.9 (4.9)	0.5 (1.4)	6.05 (130)	0.001
DMFT, mean (SD)	7.4 (5.8)	10.7 (6.8)	5.7 (4.3)	5.18 (130)	0.001

*Calculated using unpaired t-test

Table 4 Differences in mean values for number of decayed teeth (DT), sum of decayed, missing or filled teeth (DMFT) and sum-score for oral impact on daily performances (OIDP) between refugees from Africa and the Middle East—unadjusted, and adjusted for age, gender and level of education

Dependent variables	Independent variables	Unadjusted				Adjusted				
		B	S.E	95% CI	p	B	S.E.	95% CI	p	R^2
Number of decayed teeth (DT)	Origin (Africa/Middle East)	1.30	0.63	0.06; 2.54	**0.039**	1.38	0.68	0.04; 2.73	**0.044**	0.061
	Age (continuous)	0.01	0.01	−0.05; 0.05	0.963	−0.02	0.03	−0.07; 0.04	0.577	
	Gender (male/female)	−0.11	0.67	−1.43; 1.20	0.864	−0.24	0.69	−1.61; 1.15	0.732	
	No education	1.72	0.97	−0.19; 3.64	0.078	1.98	1.21	−0.40;4.37	0.102	
	Education 1–7 years	0.07	0.78	−1.48; 1.62	0.929	0.58	1.05	−1.49; 2.65	0.582	
	Education 8–10 years	−0.63	0.72	−2.05; 0.79	0.383	0.062	1.00	−1.92; 2.04	0.951	
	Education 11–13 years	−0.36	0.65	−1.64; 0.93	0.586	0.14	0.92	−1.69; 1.97	0.877	
	University education	0.09	0.80	−1.48; 1.66	0.911	Ref.				
Sum of decayed missing or filled teeth (DMFT)	Origin (Africa/Middle East)	5.01	0.97	3.10; 6.93	**0.001**	3.93	1.01	1.94; 5.92	**0.001**	0.265
	Age (continuous)	0.18	0.04	0.09; 0.26	**0.001**	0.14	0.04	0.06; 0.22	**0.001**	
	Gender (male/female)	−1.10	1.11	−3.29; 1.09	0.322	0.27	1.03	−1.76; 2.30	0.793	
	No education	1.27	1.63	−1.96; 4.50	0.437	−0.66	1.78	−4.18; 2.87	0.713	
	Education 1–7 years	−1.16	1.30	−3.73; 1.42	0.376	−1,87	1.54	−4.93; 1.18	0.227	
	Education 8–10 years	−1.98	1.19	−4.33; 0.37	0.098	−2.07	1.48	−5.00; 0.85	0.163	
	Education 11–13 years	−0.21	1.09	−2.36; 1.94	0.848	−1.22	1.36	−3.92; 1.48	0.374	
	University education	3.09	1.30	0.52; 5.66	**0.019**	Ref.				
Oral impact on daily performances (OIDP)	Origin (Africa/Middle East)	−2.90	1.54	−5.95; 0.15	0.062	−3.72	1.66	−6.99; −0.44	**0.026**	0.076
	Age (continuous)	−0.04	0.06	−0.16; 0.09	0.582	−0.04	0.07	−0.17; 0.09	0.588	
	Gender (male/female)	−2.33	1.62	−5.54; 0.88	0.153	−2.96	1.69	−6.30; 0.39	0.083	
	No education	1.30	2.40	−3.45; 6.05	0.589	0.20	2.94	−5.61; 6.01	0.946	
	Education 1–7 years	−2.57	1.91	−6.34; 1.21	0.181	−3.93	2.54	−8.97; 1.10	0.125	
	Education 8–10 years	1.04	1.76	−2.45; 4.53	0.558	−1.58	2.43	−6.40; 3.24	0.518	
	Education 11–13 years	−0.39	1.60	−3.55; 2.78	0.810	−2.26	2.25	−6.71; 2.19	0.317	
	University education	1.10	1.95	−2.76; 4.96	0.573	Ref.				

Bold values indicate significance level 0.05

Table 4 shows associations between origin and number of decayed teeth, DMFT and OIDP sum-score in a multiple linear regression model. When adjusted for age gender and level of education, origin was significantly associated with all the dependent variables, with more decayed teeth, higher DMFT and more oral impacts on daily performances (lower OIDP sum-score) in refugees from the Middle East.

Discussion

Most of the refugees had clinically detectable caries, with significantly higher caries burden in refugees from the Middle East. On the other hand, mean number of missing teeth was low. Half of the participants reported one or more negative impacts on daily life at least once weekly due to dental problems.

The majority of the refugees assessed their oral health as poor and believed to be in need of dental treatment. In a recent study of Syrian refugee children, Pani et al. [23] found that oral health challenges adversely affected their quality of life, with dental pain leading to anger, frustration and "change of psyche". In the present study, origin was significantly associated with OIDP, with more oral impacts in refugees from the Middle East than from Africa.

Language, culture and socio-economic factors are prominent barriers to care-seeking [24]. Significantly more refugees from the Middle East reported cost and problems with understanding the Norwegian health-care system as barriers to seeking dental care compared to participants from Africa. This fits well with the lower degree of perceived oral health problems in African participants.

Clinical examination revealed poor oral health status in refugees overall compared to the average population in most European countries [25–27]. Compared to Norwegian adults, the mean number of decayed teeth in the study sample was four times higher, and the mean number of filled teeth was six times lower [27], reflecting a high need for dental services. These findings are consistent with results from overseas studies [7–9, 14]. Previous studies also demonstrated that oral health status in refugees was poorer than in other immigrant groups [7, 9, 10].

The total caries burden was significantly higher in refugees from the Middle East compared to Africans. There are no indications of higher DMFT in the African and Middle Eastern region than in European populations, but rates of untreated caries are higher, especially in Middle Eastern countries [16, 25]. DT-numbers are lower in most African countries [16], despite the lower access to dental services, as confirmed by the present study. The higher caries rates in the Middle East are often seen in connection with exposure to Western diet in developing countries, and dental policies failing to control excessive sugar consumption [28]. But other explanatory factors, such as tooth cleaning habits and access to fluoride must also be considered.

Fluoride is an important factor in preventing caries although too high levels may disturb dental development. High content of fluoride in the groundwater is found in an area extending from Syria to Kenya [29], and therefore is not likely to explain oral health-disparities between Africa and the Middle East.

Tooth-brushing was a daily habit for all the African participants, compared to 87% of refugees from the Middle East. The African countries where most participants originated from, were Eritrea and Somalia. There is little research on Eritrean oral health, but several studies emphasize the importance of oral hygiene in Somalian culture and religion [13–15]. Moreover, traditional Somalian diet is low in fat and sugar, which may contribute to the lower caries prevalence in the African participants. But research has demonstrated a tendency of Somali refugees to easily adapt to a Western diet [13, 14]. Therefore, dietary information to encourage continuation of positive cultural traditions may be important to emphasize in future reception programs. The use of stick-brush may have been under-reported because of the open-ended nature of the question. Adams et al. [15] revealed that Somali refugees preferred the stick-brush after resettlement, but that it may be difficult to obtain in some Western countries.

Some limitations should be acknowledged. Measurement errors are likely, especially response errors related to self-reported oral health and OIDP. The participants talked different languages, and despite professional written translations of all questions to guide the interpreters, misunderstandings could happen. Due to the amount of languages and lack of qualified translators, it was not feasible to have the OIDP-inventory back-translated. To ensure equality, and avoid stigmatizing illiterate participants, all questions were asked orally.

Some oral health-issues, like tooth-grinding, jaw pain and need for orthodontic treatment were not registered systematically, and the study did not include radiographs. Available radiographs would likely have increased caries prevalence and strengthened the results of the study, and is thus not perceived as a limitation.

A major advantage is the representativeness of the study. Examination at the refugees' residence and avoiding exposure to sharp instruments probably contributed to the high participation rate. The convenience sample of reception centers is not likely to affect generalizability, since refugees are distributed randomly to Norwegian centers [17]. The sample size was sufficient, and the probability of inter-examiner variation was low. Furthermore, the probability of measurement error in the independent variables was low, since responses were confirmed by the Norwegian directory of immigration. The use of internationally accepted

instruments for the dependent variables allows for international comparisons.

In conclusion, oral health is generally poor in all current refugee groups, and has considerable impact on daily-life situations. Despite the high caries burden, most caries was treatable at registration. This, and the low number of missing teeth, indicate that most refugees have the prerequisites for good dentition, provided they get the necessary dental treatment. Including oral health in refugee health-programs may prove to be beneficial to both patients and community.

The hypothesis that there are differences in oral health-challenges between refugees from Africa and the Middle East is supported, which may give some indications of future demands on oral health services.

Newly arrived refugees are preoccupied with the resettling-process, and are not likely to prioritize oral health. The results of this study support recommendations to include oral screening and referral for dental treatment in primary health-care for refugees. General practitioners should be encouraged to ask refugees about their oral health.

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Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the Norwegian Ethics Committee and with the 1964 Helsinki declaration and its later amendments.

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Paper II

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Dental anxiety in relation to torture experiences and symptoms of post-traumatic stress disorder

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Torture victims often show symptoms of dental anxiety when receiving dental care, but little systematic research is available. The purpose of this study was to explore torture experiences, symptoms of post-traumatic stress disorder (PTSD), and dental anxiety in refugees in Norway and to test the hypothesis that refugees with torture experiences are more prone to dental anxiety than refugees with no such experiences. A total of 173 refugees were interviewed shortly after an oral examination. The Modified Dental Anxiety Scale (MDAS) and the Harvard Trauma Questionnaire-PTSS16 were administered verbally through attending interpreters. Among torture victims (47%, $n = 81$), the prevalence of torture experiences involving mouth or teeth was 35% and 23%, respectively. Harvard Trauma Questionnaire mean sum scores were statistically significantly higher in torture victims (34.3 vs. 24.8). Torture survivors report a larger number of symptoms of PTSD, and dental anxiety shows a higher prevalence in refugees reporting PTSD symptoms than in refugees who do not report such symptoms. When analysed using logistic regression models, the data showed the odds of high levels of dental anxiety being 6.1 times higher in refugees with torture experiences compared with other refugees and 9.3 times higher in torture victims with PTSD symptoms. Oral health professionals should be aware of these associations when providing dental care to refugees. The hypothesis that tortured refugees are more prone to dental anxiety is supported.

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In recent years, Europe has experienced a marked increase in refugees and asylum seekers from countries ravaged by war and riots. Most of these refugees handle the resettlement well, but as a group they have a high prevalence of mental health problems when compared with both the host populations and other immigrant groups (1). This may be linked to stressful events before flight, such as torture and other war-related trauma, and stress during the flight itself (2).

According to the United Nations convention against torture, torture comprises intentionally inflicted severe pain or suffering, physical or mental. The inflictor is acting in an official capacity and has the purpose of obtaining information or a confession through punishing, threatening, coercing, intimidating, or discriminating (3). The prevalence of torture experience among refugees varies from 5% to 57% in different studies, depending on the country of origin and where the studies are conducted, namely primary care or specialized health care (4).

In a Danish study, 13% of participants who reported having been exposed to torture were referred for a forensic dental examination because of oral health problems, but the authors admit that this group was highly selected (5). Survivors of torture often present with oral pain, missing teeth, and need for dental treatment (6, 7), and restoring oral conditions may be an important part of the total rehabilitation process, especially when the torture has directly involved the teeth (7, 8).

Several aspects of the dental visit resemble the torture situation. The patients may feel tied to the dental chair and are literally underneath health personnel in white coats administering sharp, metallic instruments with strong resemblances to torture devices. Bright light directed towards the face may reactivate memories of the interrogations and provoke loss of control, and victims of water torture may react strongly to exposure to water in the oral cavity. Thus, it is reasonable to expect victims of torture to experience a certain degree of anxiety in conjunction with dental visits because this may trigger previous torture experiences (6, 9).

Prior research has shown that victims of sexual abuse may be at increased risk of developing dental anxiety

(10). A few studies have also pointed to a correlation between dental anxiety and post-traumatic stress disorder (PTSD) (11). Post-traumatic stress disorder and PTSD symptoms correlate positively with torture and other war-related trauma (12), with the main symptoms being increased arousal and reactive symptoms, avoidance behaviour, negative thoughts and feelings, and re-experiencing the trauma through flashbacks and nightmares (13).

Despite the high motivation to have their smile and oral function restored (8), many torture survivors in rehabilitation centres report high levels of dental anxiety (6, 7, 9). However, to our knowledge, the relationship has not been systematically explored.

The aims of the study were: (i) to determine the prevalence of torture experiences directed against the mouth or teeth in a current refugee population; (ii) to test the hypothesis that refugees with torture experience are more prone to dental anxiety than non-tortured individuals in the same refugee population; and (iii) to explore the relationship between symptoms of PTSD, torture experience, and dental anxiety.

Material and methods

To recruit relevant participants, individuals with refugee status in Norway – both resettlement-refugees and asylum seekers granted permanent residency – were invited to participate in the study. On arrival in Norway, the Norwegian Directorate of Immigration (UDI) distributes all refugees randomly to reception centres throughout the country, in which they are required to stay in order to receive financial support while awaiting permanent resettlement in municipalities (14). Individuals residing in the eight major reception centres in the eastern part of Norway were invited to participate in the study.

First of all, we needed to calculate the sample size required to determine the difference in dental anxiety between torture victims in our refugee population and a comparable general population. For comparison, Åstrøm *et al.* (15) found the Dental Anxiety Scale (DAS) mean score to be 8.7 (SD = 3.7) in a population of 1509, 25-yr-old Norwegians. Given a significance level of 5%, a power of 90%, and a least clinical relevant difference of two units, we calculated a need for 37 participants with torture experience. Based on a 20%–25% prevalence of torture experience (16), we aimed to recruit 150–200 refugees.

Data collection took place between 17 December 2013 and 3 June 2015. All adult residents who originated from countries known to practice torture (17) were invited to participate. The exclusion criteria were as follows: (i) age ≤18 yr (because of the systematic enrollment of this group in the Norwegian public oral health system); and (ii) not fluent in any of the five most common languages among current refugees in Norway (Arabic, Sorani, Tigrinya, Amharic, Somali), Norwegian, or English. The Norwegian Ethics Committee approved the consent form, and professional translations were made to all relevant languages. Participants received invitations, including the consent form, from employees at the reception centres at least 1 week before data were collected. Interpreters were available for illiterate participants. Data were collected on days when refugees had no planned activities outside the reception centres, and of the present invitees, only four declined to participate. In total, 173 refugees provided written informed consent to take part in the study.

Data collection included an oral examination followed by the verbally administered questionnaires, all performed by the first author who is a trained dentist, and with attending interpreters. All questions were read aloud and registered by the interviewer. The interpreters used written professional translations (18) of the interview guide to ensure equality in the translation process.

Oral examinations were conducted according to the methods described by Singh *et al.* (6). The dentist used a penlight and headlight, a disposable mouth mirror, disposable gloves, and sterile gauze to inspect the mouth. Intra-oral photographs were taken for documentation. Radiographs were not available.

Measures

The sociodemographic variables recorded were age, gender, educational level (university level/lower), country of birth, preferred language to discuss health issues and the time since arrival in Norway.

The utilization of dental services was measured by asking, 'Have you ever visited a dentist?' (yes/no). If yes, 'When and where was your last dental visit?' Self-perceived oral health was explored based on two questions: 'Are you satisfied with your own teeth?' (yes/no); and 'Do you think you have any untreated dental conditions?' (yes/no).

An objective oral treatment need was registered if a participant had either visible tooth decay [defined according to Singh *et al.* (6) as ≥0.5 mm of tooth structure loss at the enamel surface and brown coloration of the cavity walls], active periodontitis (mobile teeth combined with visible plaque or calculus), oral pathology, or dentures in need of repair.

Torture experience and PTSD symptoms were assessed according to the trauma section of the Harvard Trauma Questionnaire Revised Part 4 (HTQ-R) (19), an instrument that has been translated to most languages spoken by the participants. The cut-off for PTSD as a psychiatric disorder is usually set at 40, whereas a sum score of ≥32 indicates the presence of PTSD symptoms (19).

After answering the HTQ-R, the participants were asked, 'Have you been exposed to torture?' (yes/no). If yes, the participants were asked, 'Have you experienced torture directed towards the (i) face (ii) mouth (iii) or teeth?' (yes/no). If no, the participants were asked, 'Have you been exposed to other systematic abuse?' (yes/no).

Dental anxiety was measured using the Modified Dental Anxiety Scale (MDAS) (20), which consists of five questions: 'If you went to the dentist tomorrow, how would you feel?'; 'If you were sitting in the waiting room, waiting for treatment, how would you feel?'; 'If you were about to have a tooth drilled, how would you feel?'; 'If you were about to have your teeth scaled and polished, how would you feel?'; and 'If you were about to have a local anaesthetic injection in your gum, above an upper back tooth, how would you feel?'. The response alternatives ranged from 'not anxious' (score = 1) to extremely anxious (score = 5). The cut-off was set at ≥15 for dental anxiety and as ≥19 for being very dentally anxious, as described by Humphris *et al.* (20).

Analysis

Intra-examiner agreement was tested by examining patients at the Dental Faculty in Oslo at their first and second appointments, before they received dental treatment. For decayed, missing, and filled teeth (DMFT) Cohen's kappa was 0.91. Inter-examiner reliability of the examiner had previously been tested for a study comparing manual and electric toothbrushes (21).

Statistical analyses were performed using SPSS 24.0 (IBM, Chicago, IL, USA). The differences between groups were tested using Pearson's chi-square test or Fisher's exact test for categorical variables and the unpaired *t*-test, Mann–Whitney *U*-test, or Kruskal–Wallis H-test for continuous variables. The associations between torture experience and high levels of dental anxiety were studied in logistic regression models with adjustment for gender, age, education, and the need for dental treatment. The assumptions for logistic regression models were checked and adequately met. The Hosmer–Lemeshow test indicated no evidence of poor fit ($P = 0.77$ for torture experience and $P = 0.44$ for torture experience and PTSD symptoms).

Ethics

To avoid re-traumatizing vulnerable participants, sharp instruments were not used during screening. Following both the dental screening and the interview, there was time for questions and reflections from the participants. The researcher was also available for telephone consultations in retrospect. The participants were informed of any pathology found, and when in need of immediate or emergency oral treatment, they were referred to a dentist. Participants with torture experiences and dental treatment need, or other participants with high levels of dental anxiety, were offered free consultations and dental treatment by specialized teams consisting of dental health personnel and psychologists. The participants were also asked if they needed to speak to a professional health or social worker about their traumatic experiences not related to dental visits, and this was followed by referral to the public health nurse for follow-up.

The Norwegian Directorate of Immigration (UDI) and the Norwegian Ethics Committee approved the project (2013/1080/REK South-East A).

Results

The 173 participants originated from 13 different countries although the majority were from Eritrea (62), Syria (42), and Somalia (31). The mean time of residence in Norway was 2.2 yr (median 1.0 yr). In total, 67% were men and 47% had been exposed to torture. Thirty-eight percent of the participants had received dental treatment after arriving in Norway. Table 1 shows the torture experience in relation to gender, age, education, dental treatment experience, and subjective and objective oral health measures.

Of the male participants, 52% reported torture experiences, including sexual torture, compared with 37% of the women. In addition, among the women reporting no torture experience, 31% reported sexual abuse in situations not defined as torture. Torture prevalence was especially high in refugees from Eritrea (55%), with several participants expressing unsolicited information regarding imprisonment. In torture survivors, 62% ($n = 50$) had experienced torture against their face, 35% ($n = 28$) against their mouth, and 23% ($n = 19$) against their teeth.

Table 1

Torture experience in relation to demographics, dental treatment experience, and oral health

Variable	Torture experience $n = 81$	No torture experience $n = 92$	P*
Gender			
Female	21 (25.9)	36 (39.1)	0.065
Male	60 (74.1)	56 (60.9)	
Age			
19–30 yr	35 (43.2)	52 (56.5)	0.081
>30 yr	46 (56.2)	40 (43.5)	
Education at university level	23 (28.4)	14 (15.2)	**0.035**
Dental treatment experience	56 (69.1)	66 (71.7)	0.708
Satisfied with teeth	32 (39.5)	49 (53.3)	0.070
Subjective oral treatment need	70 (86.4)	64 (69.6)	**0.008**
Dentist-determined treatment need	68 (84.4)	73 (79.3)	0.437

Bold indicates significance level 0.05.
Values are given as *n* (%).
*Chi-square test.

Among participants reporting torture, 53.1% showed symptoms of PTSD (HTQ-R-sum ≥ 32), compared with 20.7% of other participants ($P = 0.001$). Mean (±SD) HTQ-R sum scores were 34.3 (± 12.0) and 24.8 (± 8.0), respectively ($P = 0.001$). Table 2 lists the 16 PTSD symptoms in the HTQ-R and shows the prevalence of symptoms during the previous week among refugees with and without torture experience.

In refugees presenting with high levels of dental anxiety (MDAS ≥ 19), the HTQ-R mean (± SD) was 39.9 (± 14.9) compared with 28.5 in other refugees ($P = 0.001$). Table 3 shows the MDAS mean score and the levels of dental anxiety in relation to torture experience and PTSD symptoms in all participants. The percentage with dental anxiety was significantly higher in participants with both torture experience and PTSD symptoms compared with other participants.

In refugees with dental treatment-experience after arriving in Norway, the median MDAS score was 11 ($n = 31$) in torture survivors compared with 7 ($n = 35$) in other refugees ($P = 0.025$, Mann–Whitney *U*-test). The boxplot in Fig. 1 displays the MDAS sum scores in relation to torture experiences (no torture experience, torture not involving teeth, and torture against teeth) in participants who had dental treatment experiences after their flight compared with those who had not.

Table 4 presents logistic regression models for the association between high levels of dental anxiety (MDAS ≥ 19) and torture experience, in the presence or absence of PTSD symptoms. When adjusting for gender, age, education, and self-perceived dental

Table 2

Percentage of participants reporting post-traumatic stress disorder (PTSD) symptoms during the previous week

PTSD symptom	Torture experience (n = 81)	No torture experience (n = 92)	P*
Recurrent thoughts or memories of the most hurtful or terrifying events	46.9	18.5	**0.001**
Feeling as though the event is happening again	34.6	9.8	**0.001**
Recurrent nightmares	29.6	8.7	**0.001**
Feeling detached or withdrawn from people	22.2	12.0	0.071
Unable to feel emotions	17.3	3.3	**0.002**
Feeling jumpy, easily startled	32.1	19.6	0.059
Difficulty concentrating	27.2	13.0	**0.020**
Trouble sleeping	33.3	8.7	**0.001**
Feeling on guard	30.9	8.7	**0.001**
Feeling irritable or having outbursts of anger	28.4	9.8	**0.002**
Avoiding activities that remind you of the traumatic or hurtful event	59.3	30.4	**0.001**
Inability to remember parts of the most hurtful or traumatic events	21.0	14.1	0.235
Less interest in daily activities	14.8	5.4	**0.039**
Feeling as if you don't have a future	16.0	1.1	**0.001**
Avoiding thoughts or feelings associated with the traumatic or hurtful events	69.1	34.8	**0.001**
Sudden emotional or physical reaction when reminded of the most hurtful or traumatic event	48.1	15.2	**0.001**

Bold indicates significance level 0.05.
*Pearson's chi-square test.

treatment need, the odds of being highly dentally anxious was 6.1 times higher in refugees with torture experience (P = 0.026) and 9.3 times higher in torture victims with PTSD symptoms (P = 0.005).

Discussion

This study examined torture experiences, PTSD symptoms, and dental anxiety in refugees in Norway and supports the hypothesis that torture victims are more prone to dental anxiety. Although most refugees have suffered from psychological trauma to some extent, PTSD symptoms are significantly more prevalent in refugees with torture experiences. Dental anxiety is more prevalent in refugees suffering from PTSD symptoms, and when controlling for sociodemographic characteristics and self-perceived dental treatment need, refugees with torture experiences are six times more likely to be highly dentally anxious than other refugees.

In the current refugee population, 47% reported torture. By comparison, a systematic review and meta-analysis of 84 surveys on populations exposed to mass conflict and displacement reported experiences of torture in 21% of the participants (22). The high prevalence of torture reported in the present study may be explained by the selective inclusion of refugees from countries known to practice torture because the aim of this study was not to measure torture prevalence in total but rather to include torture survivors in the study group.

The prevalence of torture against the mouth and teeth was 35% and 23%, respectively. Arge *et al.* (5) found that among torture survivors who were referred to clinical forensic examinations, 13.2% needed supplementary odontological examinations, which corroborates the findings of another study reporting torture against teeth in 14% of torture survivors (23). The differences in results between these studies and the present study may be a result of the heterogeneity of the refugee populations. In addition, in the present study, the memories might be relatively new in the participants' minds as they had just undergone oral screening and were interviewed by a dentist. There is also the question of definition. Torture survivors were asked if they had experienced 'torture involving their teeth'. Some may have defined water torture and oral sexual torture as 'involving teeth', whereas others may not. In the study of Danneskiold-Samsøe *et al.* (23), 38% of the torture victims reported water torture and 19% reported sexual torture. Our theory was that all types of torture involving the mouth or teeth would increase the survivors' risk of developing dental anxiety.

The report of dental treatment need by participants with torture experiences were consistent with those of the dentist, whereas the participants with no torture experiences seemed to under-report their treatment need. This may be associated with level of education because more participants with education at university level reported torture experiences. Other studies suggest that immigrants and asylum seekers with an academic degree more often report the need for dental treatment (24). The overall need for oral treatment in the current refugee population was high, with visible carious lesions in 89% (25). The oral treatment need among torture survivors (84%) corroborates the results from a US study in which 76% of torture survivors had untreated cavities and 90% required immediate dental care (6).

Over half of the torture survivors had symptoms of PTSD compared with 21% of other participants. In a systematic review, Steel *et al.* (22) found the prevalence of PTSD in conflict-affected populations to range from 13% to 25% and reported that torture was significantly associated with PTSD.

Among torture survivors, the most prevalent PTSD symptoms were avoiding thoughts and feelings or activities that would remind the individual of traumatic and

Table 3

Comparison of the Modified Dental Anxiety Scale (MDAS) mean sum score, the percentage of refugees with dental anxiety (MDAS ≥ 15), and the percentage of refugees with high levels of dental anxiety (MDAS ≥ 19) in those with or without torture experience, post-traumatic stress disorder (PTSD) symptoms, and the combination of torture experience and PTSD symptoms

Variable	MDAS Mean (SD)	*P*	MDAS ≥ 15(%)	*P*	MDAS ≥ 19(%)	*P*
Torture experience (n = 81)	9.3 (5.0)	0.118*	13.6	0.586†	9.9	0.075†
Other participants (n = 92)	8.2 (4.2)		10.9		3.3	
PTSD symptoms (n = 62)	10.6 (5.3)	0.001*	24.2	0.001†	12.9	0.018‡
Other participants (n = 111)	7.7 (3.8)		5.4		2.7	
PTSD symptoms and torture experience (n = 43)	10.9 (5.6)	0.001*	23.3	0.010†	16.3	0.006‡
Other participants (n = 130)	8.0 (4.0)		8.5		3.1	

*Unpaired *t*-test.
†Pearson's chi-square test.
‡Fisher's exact test.

hurtful events and re-experiencing symptoms. This fits well with the results from a dental anxiety study in which 41% of the subjects with high dental anxiety displayed avoidance behaviour and 43% had symptoms of re-experiencing traumatic events (11). De Jongh *et al.* (11) found that severe dental anxiety has many characteristics similar to PTSD and its onset is often triggered by one or more traumatic incidents that are often, but not always, related to dental trauma. Thus, it is reasonable to assume that a torture survivor with PTSD symptoms will be more susceptible to triggers during a dental treatment situation and be more prone to develop dental anxiety. In a Finnish pilot study (24), 56% of asylum seekers claimed to be afraid of visiting a dentist and 44% reported terrifying experiences at dental offices in Finland. Both dental fear and mental stress were more common among asylum seekers than among immigrants in the study group (24). Singh *et al.* (6) state that 'individuals who have been tortured are often fearful, anxious and panicked when placed in a prone position, and sharp dental objects may trigger recollection of torture'.

The overall mean MDAS score in torture survivors was 9.3, not significantly higher than for other refugees. The mean MDAS score in a representative UK sample was found to be 10.65 (26). The MDAS scores in the present study are quite low in comparison. Several of the interviewees reported that their difficult life situation and the amount of oral pain suppressed any thoughts about being afraid of dental treatment. Because of the massive need for dental treatment in the study group, the high motivation to receive dental treatment may have overruled dental anxiety. Another consideration is that only one-third of the refugees had visited a dentist after experiencing traumatic or hurtful events and that this group expressed significantly more dental anxiety than those who had not seen a dentist. This may indicate that the dental visit triggered psychological reactions and the latter group's view on the matter might change after re-experiencing the dental treatment situation.

The number of participants with torture experience involving the mouth or teeth was too small to determine statistically whether this group is more dentally anxious than other torture survivors. However, the results suggest that refugees with dental treatment experience after their flight are more prone to dental anxiety if they have been exposed to torture against their teeth. In a clinical context, this highlights the need for knowledge and adequate psychological consideration from dentists who treat refugees.

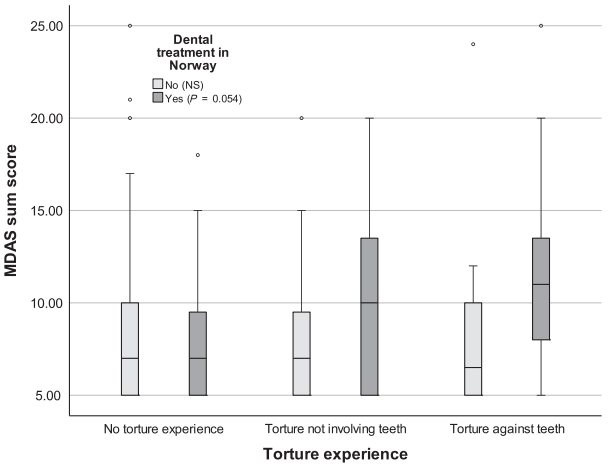

Fig. 1. Boxplot of Modified Dental Anxiety Scale (MDAS) sum scores vs. torture experiences in refugees with and without dental treatment experience after their flight. Statistical differences are tested using the Kruskal–Wallis H-test. NS, not significant.

When we controlled for gender, age, education, and self-perceived dental treatment need, the odds of having high levels of dental anxiety were 6.1 times higher in torture survivors and 9.3 times higher in torture survivors with PTSD symptoms. This fits well with the finding of De Jongh *et al.* (11), that being a victim of a violent crime increased the risk of being dentally anxious by 5.6 times. Research on who are most susceptible to post-traumatic distress after torture points to a lack of social support, the number of times detained for political reasons, strong religiousness, and female gender (27). In agreement with the

Table 4

Comparison of high levels of dental anxiety [Modified Dental Anxiety Scale (MDAS) ≥ 19] in participants with torture experience, with or without post-traumatic stress disorder (PTSD) symptoms

Variable		Unadjusted effects			Adjusted effects		
		OR	95% CI	*P*	OR	95% CI	*P*
Torture experience	No (ref.)	1			1		
	Yes	3.25	0.83–12.70	0.090	6.12	1.25–30.29	**0.026**
Gender	Male (ref.)	1			1		
	Female	3.92	1.10–14.00	0.035	9.50	2.01–44.97	**0.005**
Age	19–30 (ref.)	1			1		
	>30	0.83	0.24–2.84	0.771	0.80	0.19–3.35	0.761
University level education	No (ref.)	1			1		
	Yes	3.39	0.97–11.80	0.056	4.20	0.98–18.10	0.054
Dental treatment need	No (ref.)	1			1		
	Yes	0.48	0.13–1.74	0.266	0.23	0.05–1.16	0.075
Torture experience and PTSD symptoms	No (ref.)	1			1		
	Yes	6.13	1.70–22.10	0.006	9.26	1.93–44.45	**0.005**
Gender	Male (ref.)	1			1		
	Female	3.92	1.10–14.00	0.035	7.09	1.48–33.92	**0.014**
Age	19–30 (ref.)	1			1		
	>30	0.83	0.24–2.84	0.771	0.98	0.90–1.04	0.365
University level education	No (ref.)	1			1		
	Yes	3.39	0.97–11.80	0.056	4.96	1.05–23.54	**0.044**
Dental treatment need	No (ref.)	1			1		
	Yes	0.48	0.13–1.74	0.266	0.20	0.04–1.02	0.053

Bold indicates significance level 0.05.
Results were calculated using logistic regression analysis and are given as OR and 95% CI.

present findings, female refugees appear to be at a greater risk of sexual abuse (28), which is a known risk factor for dental anxiety, especially when the abuse involved oral penetration (10).

Some limitations should be acknowledged. The measurements of torture experience, PTSD symptoms, and dental anxiety are based on a self-reporting process, which makes it subject to recall bias. Although the question concerning torture experience was linked to the Harvard Trauma Questionnaire, as in most of the surveys reviewed by Steel *et al.* (22), there is always the possibility of different personal interpretations of the term. There may also be problems with the cultural specificity in the measures, and all results must be viewed in the light of linguistic challenges. It was not feasible to have all inventories back-translated to all languages. However, to ensure equality, all questions were asked orally with attending interpreters, which made it possible to include illiterate participants.

There are multiple pathways to both dental anxiety and PTSD, and many aspects of possible comorbidity are not identified. Many participants mentioned post-migration stressors, such as separation from family, social and economic strain, and feelings of insecurity, but this was not measured systematically or included in our analyses.

The cross-sectional nature of the study is a limitation as it will not allow us to distinguish whether the dental anxiety appeared before or after the torture experiences or whether or not there was a causal relationship between the traumatic experiences and the PTSD symptoms and/or the dental anxiety. Nevertheless, it is highly unlikely that dental anxiety has a causal influence on who are or are not victims of torture.

The major strengths were the high participation rate and the representativeness of the study. Interviews and screening were performed at the refugees' residence, and the assessments were made in a neutral context that was temporally and physically distinct from triggers that could elicit anxiety. The sample was representative of current refugees in Norway from countries known to practice torture, as refugees are distributed randomly to reception centres throughout the country (14). Some may argue that the heterogeneity of the refugee populations over time affects the generalizability. However, according to Amnesty International (17), every third country practices torture, and the use of torture worldwide seems to be increasing. To our knowledge, this is the first study to compare dental anxiety in torture survivors with non-tortured individuals from the same population. The sample size was sufficient, and the probability of inter-examiner variation was low. Furthermore, undergoing a dental screening before the interviews gave the participants time to gain confidence in the researcher, which may have facilitated answering some of the psychologically demanding questions. Studies have also found that traumatic events are more likely to be reported to health-care personnel when a professional interpreter is present (29).

In conclusion, a high number of the current refugees reported torture experiences. The prevalence of torture against the mouth and teeth was 35% and 23%,

respectively. In refugee women claiming no torture experience, 31% reported sexual abuse. To avoid psychological re-traumatization, health personnel, including dentists, must consider this when providing health care to refugees.

The hypothesis that tortured refugees are more prone to dental anxiety is supported. Although dental anxiety may not be a major issue for the refugee population as a whole, some traumatized individuals are extremely anxious. Torture survivors report a significantly larger number of symptoms of PTSD, and dental anxiety shows a higher prevalence in refugees suffering from PTSD symptoms than in refugees who do not. Oral health professionals should be aware of this and be attentive when they meet refugee patients with evident dental anxiety. In addition, the following questions arise. Will this patient conceal other psychological issues that have not been addressed? Does this patient receive proper mental and physical health care? The patient may have PTSD and/or be a torture victim. Is there a need for a further referral?

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Paper III

The torture victim and the dentist: The social and material dynamics of trauma re-experiencing triggered by dental visits

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Abstract

Introduction: A significant proportion of refugees have been subjected to torture involving their mouth or teeth. Still the importance of oral health challenges is often overlooked. We present an exploration of the process through which trauma-related reactions are produced in torture victims in the course of undergoing dental treatment.

Methods: Ten resettled refugees from Africa and the Middle East who experienced torture were recruited among patients affiliated with specialized clinics for oral health rehabilitation in Norway. Data were collected through semi-structured exploratory interviews, and analysed using a qualitative content analysis approach.

Results and discussion: Our data suggest that dental treatment often involves an experience of being suspended, albeit temporarily, in an objectified position, acted on by subjects capable of producing deeply undesirable mental, emotional, or bodily states. Going to the dentist entails choosing or accepting to be in a passive position, acted upon by elements in the clinical situation. These elements, we propose, may usefully be considered as subjects, i.e. agents. Three main categories emerged as the most prominent factors with such an agentic capacity: 1) pain, 2) traumatic memories and 3) the dentist. Submitting to dental treatment hence requires the patient's willingness to give in to the actions of these factors, and avoiding treatment may therefore, in this situation, represent a means of retaining control.

Keywords: oral health, dental treatment, torture survivors, posttraumatic stress, rehabilitation

Introduction

The flow of refugees towards Europe during the last decade has placed increased demands on the health care services. Torture prevalence in refugees varies across studies, but is considered to be substantial (Sigvardsdotter et al., 2016; Steel et al., 2009), and survivors of torture often suffer from oral health problems with potentially grave and debilitating physical and psychological implications (Høyvik et al., 2019). Yet, challenges related to oral health and dental treatment are often overlooked in the overall rehabilitation of torture victims. In a recent survey of newly arrived

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refugees in Norway, 47% reported torture experiences, and 35% reported having been subjected to torture involving their mouth or teeth (Høyvik et al., 2019).

Torture entails depriving the victim of control, which is a significant factor in the development of trauma disorders (Başoğlu, 2009), and systematic reviews have estimated the prevalence of post-traumatic stress disorder (PTSD) in torture survivors to be at least 31% (Abu Suhaiban et al., 2019; Steel et al., 2009). Additionally, a comorbidity above 65% is found between PTSD, depression, and anxiety disorders (Close et al., 2016).

Studies have shown that oral treatment-needs, and oral impacts on quality of life in refugee populations are generally high (Abu-Awwad et al., 2020; Bhusari et al., 2020; Keboa et al., 2016). Moreover, research populations with impaired mental health show a higher burden of oral health problems than comparable healthy populations. The accumulation of oral disease is explained by an array of factors, including reduced ability to maintain oral hygiene, irregular eating habits, tooth grinding, medication, and reduced utilization of dental health services due to both psychological and financial factors (Kisely, 2016). Certain types of mental disorder are highly associated with dental anxiety and Lenk et al. (2013) found the highest relative risk in patients with PTSD.

High dental anxiety, with avoidance of oral health services and deterioration of oral health, is a public health problem that affects about 5% of the adult population (Svensson et al., 2016). The relationship between torture, PTSD symptoms and dental anxiety was supported by a recent survey (Høyvik et al., 2019) in which the odds of high dental anxiety were 6.1 times higher in torture victims compared to other refugees, and 9.3 times higher in torture victims with PTSD symptoms. Cognitive theories have proposed that individuals with PTSD hold maladaptive beliefs that contribute to maintaining the disorder (Ehlers & Clark, 2000), and such beliefs of uncontrollability, unpredictability and dangerousness have been linked to fear of going to the dentist (Armfield et al., 2008).

The nature of torture and the characteristics of oral health and dental treatment infuse dental care with specific challenges and dangers for survivors of torture. Not only is the oral cavity generally perceived as a private and sensitive area, which makes it an attractive target for the inflictors of torture, a lot of what goes on in the dental office may also evoke the torture situation itself. The patients find themselves in an objectified position – deprived of control, positioned passively underneath a dentist who administers sharp instruments, bright light and water, and records medical history in a way that may evoke interrogation. Thus, as theorised by Singh et al. (2008), undergoing dental treatment may re-activate psychological trauma in torture survivors.

Despite these assumptions, little research is found on the specific nature and consequences of oral health challenges faced by torture victims, and a deeper understanding may be an essential contribution to the development of targeted dental treatment programs. Some parallels might, however, be drawn to studies on victims of sexual abuse. Fredriksen et al. (2020) propose that the experiences of dental anxiety are triggered not only by sensory stimuli associated with the dental procedures, but to a large extent by sensory stimuli bearing comparison with previous traumatic experiences. To our knowledge, however, the nature of such triggering events has hitherto received scant attention in research. Hence it is our purpose in what follows to contribute to such an examination. Based on the accounts and reflections of refugee dental patients with experience of torture, we aim to explore the pos-

sible dynamics of social and material factors working together to set off and sustain distressing reactions.

Material and method

The study followed a qualitative design, with semi-structured exploratory interviews. Informants were recruited by professionals affiliated with specialised clinics for oral health rehabilitation of traumatized patients (TADA-service, Norwegian Directorate of Health). The names and contact information of consenting candidates were forwarded to the research group, who invited the informants to take part in the study by telephone. Those who agreed to participate signed a written informed consent form. Inclusion criteria were 1) age > 18 years; 2) experience of torture; 3) post-torture dental treatment experience in Norway.

The research group acknowledged beforehand the relatively small population from which our study aimed to recruit, and also anticipated a low consent rate given the study topic. On this basis, and aiming to maximize variation in a limited sample, a desired minimum sample size was set at 10–15 informants, comprising different ages, genders, countries of origin, types of torture experienced and dental treatment experienced. The interview study explored the informants' reactions and reflections, looking to identify patterns and understand the dynamics involved in their experiences of dental care following past torture experiences.

The interviews took place between April 2019 and January 2020, and were all conducted by the first author in mutually agreed, non-clinical environments. All interviews were audiotaped with the consent of the informants. To minimise language and cultural barriers, professional interpreters were available to all informants, and five informants chose to use one. Three interviews were conducted in Norwegian and two in English.

To explore torture survivors' challenges related to oral health and dental treatment, an interview guide was prepared based on literature review and the professional experiences of the multidisciplinary research group. The interview guide identified six thematic areas for semi-structured exploration in the research interviews: 1) Expectations – reflections regarding treatment needs an how they might be met by the dental personnel, 2) Confidence – issues involving trust and understanding, 3) Security – discussing what affects the feeling of security in the dental treatment situation, 4) Dental anxiety – feeling of fear and anxiety before, during, and after dental treatment, 5) Satisfaction – exploring factors contributing to satisfaction with treatment and caregivers, and 6) Interplay – interaction and distribution of tasks and responsibility between dentist and patient. Interviews were conducted seeking to cultivate an atmosphere conducive to the pursuit of emergent themes while maintaining a sensitivity to the informants' reflective process. Thus, the interview guide was not followed point by point, but rather applied as a checklist.

The audio files were transcribed verbatim by the first author, omitting directly and indirectly identifiable personal data, to protect the informants' anonymity. In the presentation of data, all names are fictitious.

Description of informants

Two women and eight men aged from 28 to 65 were interviewed. They were all survivors of torture and originated from five different countries: Iran (3), Eritrea (3), Syria (2), Somalia (1) and Iraq (1). Years of residence in Norway varied from 4 to 30, and there was a great variety with respect to fluency in Norwegian, level of education, work experience and participation in society. Dental treatment

experiences from their home countries varied from zero to yearly prophylactic dental examinations, but they had all received dental treatment in Norway. None of the informants had any recollection of dental anxiety before their torture experiences. All of them presently experienced some difficulties in the dental treatment situation, whereas half of them reported a high degree of dental anxiety.

The informants were not asked to disclose details of their torture experiences, but the majority were quite eager to share. Informants' experiences of torture and imprisonment comprised: tooth extractions to inflict pain; lack of necessary dental treatment; blows and kicks against all parts of the body including the mouth; lack of opportunity to maintain personal hygiene, including tooth cleaning; denial of food; isolation; prolonged darkness; extreme light or noise; attack from behind; intimidation and unpredictability; the use of electrical currents; witnessing, or being forced to participate in killing or torturing others; hanging, suspension, choking, often involving water, and having nails pulled out. Some of the informants had experience with all of the above, and two informants claimed to have seen people die because of oral infections.

Analysis

The data were analysed using a qualitative content analysis approach aiming to classify the research material into identified categories representing explicit or inferred communication (Schreier, 2012). An inductive process was pursued in dialogue with the pre-defined topics reflected in the interview guide, as the objective was to extract new theory on a topic where prior knowledge is limited.

The transcriptions were thoroughly assessed and recurring topics were identified and formulated into preliminary codes by the first author. Next, the material was revised by all co-authors, and salient themes were developed through coding, re-coding and grouping of themes. Due to the small size of the study material, the authors developed a closeness to the transcribed interviews and found no additional gain in computer-based coding.

Ethical considerations

Torture victims may be vulnerable in the sense that merely reflecting on their past experiences may set off unpleasant reactions. To minimise the risk for re-traumatization, the interviewer was careful to not in any way put pressure on the informants and to avoid active probing into their torture experiences.

There was still a risk that some might feel discomfort during the interview. The interviewer was experienced in working with torture victims and in dealing with anxiety reactions in the dental setting and was thus prepared to handle psychological reactions that might occur. Moreover, the researchers cooperated closely with the recruiting clinics, and psychologists were available if needed. Informants were told that the interviewer would be available for telephone consultations after the interview, offering assistance or guidance with regards to possible reactions should they occur. Finally, all informants had access to specialised clinics where they could receive facilitated dental treatment should such needs be disclosed.

The informants were informed of their right to withdraw from the study at any time, and without any consequences for themselves, but none chose to do so. The Norwegian Ethics Committee approved the project (2015/2154/REK South-East C).

Results

All informants expressed a strong desire and need to have their oral problems treated. Nev-

ertheless, they also described obstacles they found hard to overcome. They all talked about difficulties with seeking and undergoing dental treatment, and half of them described severe dental anxiety. System challenges faced by refugees in general, such as access, monetary issues and language barriers, were also brought up by several informants, but such barriers are not explored further here. Instead, our focus is on the challenges that are particular to survivors of torture. These may usefully be introduced by the account of Gebre, a man in his thirties from The Horn of Africa, who summarizes the experience of the dental patient with experience of torture like this:

> *You never know if a person is traumatized! You never know what terror it could add to a person's experience if… if maybe you are not prepared for this type of treatment… all the machines that will come… You will see… and you will be below the dentist, and then… It's like you are powerless, you know! So… it could end up being a very bad experience, and then you don't want to go back to the dentist again!*

Gebre's only experience with dental treatment prior to his resettlement seven years ago was an emergency extraction. He found his first dental appointments in Norway frightening, but stated that he eventually managed to build trust in his dentist. He has since trained as a health professional himself and now finds it easy to adequately describe his past experiences. Still, his notion of feeling powerless came up in many situations across several of the interviews.

One dimension of this powerlessness relates to experience under treatment of being unaware of, and defenseless against, what happens next. Most informants emphasize the problems they experience with finding themselves in a situation where they are unable to foresee the pain or discomfort that might occur at any moment. Some draw explicit parallels to their torturers' use of surprise to scare them and leave them constantly on guard. Hamid (47 yrs), a Syrian man who had no dental treatment experience before he was subjected to torture involving his teeth, said:

> *When I sit there in the dental chair, I get really anxious, and I think a lot about what will happen. Especially when they turn on those lights… the white ones… then I feel like I'm being interrogated by someone.*

In most informants' reflections, the emphasis on the element of surprise is accompanied by stark descriptions of the effects to which that experience gave rise. Farouk, a 55-year-old man who grew up in a wealthy family in Iraq, was used to annual dental checkups and treatment. He has nevertheless had to force himself to visit a Norwegian dentist on a regular basis, and he describes his dentist as a busy man who rushes back and forth and works, 'fast, fast, fast', without informing Farouk about what he is about to do to him. Farouk describes what this unpredictability does to him:

> *I get very scared! Then some water comes here (point to his pants)… For almost half an hour, or 45 minutes it is very dangerous! So much pain in my stomach… and then in my throat… then the legs… and the back… yes… And then I am… just like in prison!*

Explicitly, or by implication, all informants express a strong need to retain a sense of control in most situations to avoid torture-related reactions. Both Hamid and Farouk describe how, when going to the dentist, they

have to more or less give in to being acted upon by different agents in the clinical room. While there, they are temporarily deprived of the ability to actively (re-)act on and manage what is happening to them. As a consequence they are pacified in a second sense, i.e., they become objects being acted upon by the automatic reactions that arise as everyday treatment events unfold, causing them severe discomfort. Informants describe how, for example, the sight of the equipment, the anticipation of pain, or the dentist's behavior may set off bodily reactions they cannot control, such as coughing, shivering, or stomachache, or psychological reactions such as a mental disconnection from thoughts and surroundings (dissociation) and the involuntary appearance of memories of past traumatic events (flashbacks).

An image emerges then, in which the informants, as dental patients, experience themselves as objects subjected to elements that includes ones that we do not usually think of as subjects, that is, as actors with agency. In what follows we present three main categories into which these agents may, we suggest, usefully be categorized: 1) the pain, 2) the traumatic memories, and 3) the dentist. We explore the interplay between these elements positioned as subjects, i.e., as agents by virtue of their capacity to effect reactions in the patient, and the patient as the object in and upon whom reactions occur and are brought to bear. Yet the process thus described is located in the interplay of social and material elements inherent in the treatment situation, rather than in the patient as such. Material elements pertains to objects, organs, and organisms, whereas social elements encompass relations between actors. Notably, actors here include also the patient's bodily expressions, distressing thoughts and images, since the appearance of these elements in the clinical setting assumes an autonomous agency (with whom the patient is confronted and has to interact) that can be usefully compared to an interactional "Other". Hence, rather than simply asserting the presence of a triggering process, we proceeded to explore specific qualities of that process or, more specifically, what we describe as the 'social and material dynamics' of the triggering event.

Pain

All informants talk about oral pain as a main driver for wanting or needing dental treatment. They describe how they have experienced beatings against their mouth or face, teeth being pulled out in prison and the lack of possibility to maintain personal hygiene, which among other things have resulted in severe dental decay. Reza, an Iranian man in his late fifties, gives an illustration of life in prison:

> *When you are isolated in prison there is no window. You have no circulation of air. It affects the entire body, including the teeth, because there is only CO_2 inside the room. There is no oxygen… And they hit a lot… with their fists. The jaws are fractured, and also the teeth get broken. And for months you can't brush your teeth… can't use toothpaste, nothing. And then it gets night… you can't sleep at night because of the anxiety and stress you are in. The teeth starts grinding into each other, and you can't control your legs…*

Reza has a university degree, but suffers from PTSD. After ten years in Norway he cannot hold a job and does not speak the language. His jaw was broken by his torturers and, although he was used to regular dental checkups during his upbringing, he developed a destructive dental and medical anxiety that has prevented him from seeking treatment that could reduce his pain.

Despite their impaired oral health, many informants express a will to endure a lot of pain before seeking dental treatment. The reasons they suggest are complex but, apart from challenges associated with the resettlement process, they express exhaustion and anxiety after imprisonment and trauma. The fear that a dental visit would bring on more pain, physical or mental, is apparent, although none of the respondents have any recollection of dental anxiety prior to the torture exposure.

All informants describe negative experiences from dental treatment, and for about half of them it is something they dread long before the appointment. They describe it as something dangerous that they cannot control. The pain may appear at any time, and at uncontrollable strength. Amir (60), another Iranian man, had several teeth fractured from beatings and kicks during imprisonment, and the only treatments offered were un-anesthetized tooth extractions, which he remembers as being extremely painful. The fear of re-living the experience made him avoid dental treatment for several years after resettlement. About going to the dentist he says:

> *After the prison it became very difficult. The worst is… it is very painful. A picture of torture appears… It hurts! … Sometimes I cough, and I get shaky… And another thing… when it has been a long time since the last time, a picture comes, and I shiver! When I go into the office… at the dentist's… and look at this and that machine… then it happens automatic!*

Pain sets in motion uncontrollable shaking and shivering in his body, and if the time between dental appointments is too long, his body forgets any positive experiences and he may experience flashbacks in which he sees images of previous traumatic episodes. Sometimes merely the anticipation of pain may bring about the reactions, long before any actual pain has occurred. He describes how his body and mind reacts automatically, and sometimes makes him lose track of time and place. With words like *"I'm gone", "I'm not here", "I see things", "I'm lost"* and *"I skip time"* he describes the psychological reactions of flashbacks and dissociation, and he points out the importance of going to a dentist who knows how to bring him back.

It is consistent throughout the interviews, even among informants who do not describe themselves as dentally anxious, that sudden and intense pain from clinical procedures harms the patient's sense of control. The pain becomes the active party, acting upon the patient who is put temporarily in a non-agentic position in which she/he can exert little control. This objectification may be partial, as when the patient shivers or becomes nauseous but still has some consciousness of what is going on, or total, as when the patient dissociates.

Anesthetics may provide pain relief, but may also entail having to choose between two evils. For some informants, the thought of needles or the feeling of numbness may accentuate the sense of losing control more than they represent relief from pain. Somalian Aaden describes how the sensation of not being able to feel his face, brought about by anesthesia, gives rise to dread at the involuntary thoughts of being permanently paralyzed. Two of the informants had been offered dental treatment under general anesthesia. Although the sedation made the actual treatment easier, post-operative pain, changes in the mouth, and the taste of blood left them with the sense that something had been 'done to' them after waking up.

Traumatic memory

In addition to pain inflicted by dental procedures, most of the informants convey how

particular things or situations that remind them of previous traumatic experiences can set off involuntary, unpleasant bodily or mental reactions. As Amir describes, the reactions *"happen automatic"*, especially in situations that involve an element of surprise. He describes how he is taken back to unforeseen episodes of violence in prison if an unannounced person, e.g., the dental secretary, suddenly appears behind him.

Aaden's heart starts pounding and his body freezes at the sight or taste of blood. If the dental personnel are inattentive, he may disconnect mentally from his surroundings and experience flashbacks. Vibration and sound have the same effects. He says:

> *The pain, it's… the pain I can take! Yeah! I have experienced so much pain. It is this one: 'Woooo… vibration and drilling and… sound… That sound - like bullets! It's taking me back all the time… times of bad things!*

His PTSD-symptoms are not only present during the treatment session. He explains that sometimes it gets worse when he gets home. Farouk, who in his own words, has 'been through all methods of torture', tells a similar story. He is exhausted for 2–3 days after dental treatment. His stomach and legs hurt, he cries and is tired but unable to sleep.

Reza states that since his imprisonment it has become very difficult for him to trust other people. He feels unsafe and alert in most situations, but when it comes to dental treatment he is extremely anxious. He knows that the dentist is not intending to harm him. Still it is difficult for him to control his body and his thoughts when he gets in a prone position. He says:

> *When I come near the dental equipment and look at it… all those episodes are experienced all over again. Because of, in prison… it is like this: maybe it is a doctor, maybe it is a dentist… maybe it is a treatment… But they also work with the government, and they misuse their profession!*

His anxiety clearly and directly relates to his past trauma. More specifically, he speaks of how experiences in the present can cause memories of experiences in the past to pay hurtful visits to him, and he has no capacity to do anything to prevent this. Instead, he has to suffer these visits, passively awaiting their fading away, for now.

Zahra is a busy, hard-working and reflective Iranian woman in her sixties. She eloquently puts the experience of agentic thoughts into words when she states that, to her, one of the most difficult challenges related to dental treatment is "*the pain in my thoughts"*. She explains:

> *It is just thoughts… I close my eyes and wait… or I sit there in the dental chair, and so… the thoughts come back…*

What she is talking about are vivid thoughts of torture. For example, the dentist's use of water can activate her memories of almost being drowned. She explains how these trauma-related thoughts are brought to mind more often in situations where she experiences loss of control.

Some of the informants express that they know and understand, cognitively, that the dental treatment is safe, but still find it almost impossible to fight their reactions. Reza explains that his cognitions and his emotions get mixed up, and although his head tells him that he is safe, his body will not always listen. Amir describes how some days are worse than others. Some days he is not ready for someone to work in his mouth:

Maybe… it may be that I had a bad day the day before. It may be, for example, that the night before was very hectic, and that I am tired and exhausted in a way…

Zahra gives an example of how the mental processes may be disrupted altogether:

One day I went to a dentist… I felt the panic coming… but luckily it came afterwards! I endured quite a lot, sitting there getting finished. But afterwards I went to a café, and I sat there for three hours without knowing… Then, after three hours, I suddenly realized: Why am I sitting here? I looked at my watch and three hours had passed…

During the dental appointment, she managed to maintain a sense of control, but afterwards the invasion of traumatic memories took over completely and left her with no agency at all. This is an example of the total objectification that occurs during dissociation – when the mind takes a break from handling information.

To sum up, the informants describe how agentic elements in the dental treatment situation contribute to positioning them as a passive intermediary object between these agents and the invasion of the traumatic memory. In this sense, the traumatic memory also acquires an agentic capacity, a capacity to propose itself to the patient in ways that appear impossible for them to prevent, and which in turn give rise to unpleasant bodily, as well as mental and emotional, effects.

The Dentist

Although most of the informants rationally believe that the dentist wants to help them, half of them say they are 'afraid of dentists'. Some describe the dental practitioner as the one who inflicts pain and hence is apiece with what reminds the patient of his traumatic experiences. Some informants describe memories of dentists, or someone impersonating a dentist, acting as torturers. Zahra gives an example:

I saw them be taken to the 'dentist'… or to the room where they would be tortured. And when they came back they had no teeth! And they got no anesthesia. They got nothing. They just pulled them out to inflict pain on them!

As dental patients, most of the informants link the problems that arise from being unable to anticipate when pain will occur to the fact that they cannot see what is happening in their mouth, the site of treatment being blocked from view. It is apparent, too, that the dentists' behavior is crucial to whether or not adverse reactions are activated, by virtue of the patients' descriptions of being unable to survey and recognize activities in the clinical space around them. Farouk, who has never found the right time to inform his dentist about his torture experiences, says:

Sometimes he does… he wants to take x-rays and such… he puts something inside here… then he goes there… and then comes quickly… and then a picture there… Everything becomes chaos! Then the secretary comes, and they both talk over my head: Get this, get that… and maybe do like this, and back… like that! And that I have to lie 'like that', and then… they just… Afterwards a lot of pain is coming here… Immediately – pain in my stomach! That way it mixes in my stomach!

It makes Farouk insecure when they are rushing back and forth, working and talking above his head. His emphasis on speed is echoed by many of the other informants, who

express that they get scared or uneasy if the dentist is working too fast.

Hamid, who had no dental treatment experience pre-resettlement, shares his opinion of the first dentist he met:

> *He behaved like… like he was a civilian police officer, as if he worked for the national security services or something!*

He says that this dentist made him feel as if he was under interrogation. He never smiled and was hard-handed and inaccurate in his work. Hamid got the impression that he did not like his job; he was just eager to finish and get on with the next patient. All informants underline the importance of communication and being treated with respect. Farouk relates this to his prison experiences and explains how his guards never talked to him when they came to torture him. Some informants also mentioned how a lack of interpreters accentuates their notion of not knowing what is about to happen, and thus increases their fear and insecurity.

Our interpretations of informants' reflections indicate that the dentist's capacity to bring about trauma-related reactions in the patient increases, or even is created, by the fact that it is inflicted on a patient who is unaware of what is going on. Thereby, the patient's experience of being a passive object is accentuated – a phenomenon which is particularly problematic to torture victims. Among the three categories of agents discussed in our analysis, the dental practitioner's position as subject is more powerful than the others, given her/his potential to set in motion both the pain and the traumatic memories. However, as the dental practitioner does not control the agentic capacity of the pain and the traumatic memories, it is reasonable to consider all three of them subjects with individual agency.

Discussion

This study explores oral health challenges in refugees with experience of torture, and proposes an analysis of what we have called a social and material anatomy of the process, through which trauma-related reactions are produced in such patients in the course of undergoing dental treatment. Although some previous studies have provided examples of such challenges (Keller et al., 2014; Singh et al., 2008), this is to our knowledge the first in-depth exploration of how they come about. The analysis shows how going to the dentist entails actively choosing or accepting to be in an objectified position, having to lie down in the dental chair and prepare to be in a passive position, acted upon by the elements of the clinical situation which we, therefore, propose are usefully considered as agents.

The present study indicates that the predominant dental treatment challenge for torture victims is the triggering of trauma-related reactions. Hence it supports previous research that has shown a strong relation between PTSD symptoms and dental anxiety (Høyvik et al., 2019; de Jongh et al., 2006). It is clear that although several of the informants understand the connection, and reflect on the unwanted, automatic reactions while they occur, they often lack the agency to break the process once it is set in motion.

Despite the great desire of many torture survivors to have their teeth restored, the fear of uncontrollable pain during dental treatment may prevail. When such pain is accompanied by adverse bodily reactions, or visions of horror, dental treatment is easily postponed or avoided, as explained by several of the informants. The propensity to avoid dental appointments was also found in victims of sexual violence (Larijani & Guggisberg, 2015).

When facing the need for dental treatment, the traumatized patients are left with

two options: 1) to consciously let go of their agency and surrender to the dental treatment, with the risk of psychological consequences, or 2) to hold on to their agency and avoid the treatment, with further deterioration of oral health as a probable outcome. From the torture victims' perspective, to refrain from placing themselves in the dental treatment position is one of very few available alternatives to mitigate psychological damage.

If the dental treatment is not avoided it is often endured under great strain, as described by several of the informants, and pain sensations during treatment hold the capacity to trigger traumatic reactions. This supports previous research that has indicated a complex relationship between torture, pain and intrusive memories, pointing to the importance of attempting an integrated treatment of pain and traumatic symptoms for survivors of torture (Taylor et al., 2013). The ability of PTSD symptoms to enhance the experience of pain, and vice versa, applies also to orofacial pain (Burris et al., 2009), which emphasizes the importance of oral rehabilitation despite the possible traumatic reactions related to the treatment.

In the same manner as patients become objects acted upon by pain, we have described how memories may acquire an agentic capacity to act on the patient in ways they consider impossible to prevent. Similar findings were reported by Taylor et al. (2013), who described how uncontrollable bodily and mental reactions in torture victims were often activated by trauma memories. Likewise, a study of sexual-abuse survivors described how anxiety reactions in the dental setting were frequently triggered by stimuli that bore similarity to previous traumatic experiences (Fredriksen et al., 2020).

There is historical evidence of dentists participating in torture, either directly or by treating injuries only to make the victims ready for new maltreatment (Speers et al., 2008). Moreover, there is an inherent power dynamic between care providers and patients, which to a survivor of torture may trigger recollections of the power dynamic that occurs between the perpetrator of torture and the victim. Some informants describe how a person who reminds them of someone from their past, or who behaves in a certain manner, can bring about memories of traumatic experiences. Thereby, the dentist in person becomes the triggering agent even by virtue of the representation of 'dentist' she/he unwittingly evokes.

The feeling of powerlessness is pervasive in the interviews. Svenaeus (2015) argues that for torture victims, pain inflicted on them as objects is often interpreted more as power than as pain. As the agent whose actions cause the experience of pain, the dentist is the party to hold power in the clinical encounter. In our analysis, the agency of the dentist extends also to the power to activate the other subjects: the pain and the traumatic memories. However, whereas the dentist is usually perceived as a trigger only when she/he is present, the pain and the traumatic memories bear the capacity to act as triggers far beyond the actual treatment situation, as explained by several informants. Physical and mental exhaustion in the aftermath of dental treatment is also described by Fredriksen et al. (2020) in their study of sexual-abuse survivors.

Being subjected to torture entails a loss of trust in humanity through the violation of bodily autonomy and feelings of self-worth (Bernstein, 2015). Most informants point out that it takes time to build trust in new people. Any unforeseen gesture is alarming, which enhances the probability that the dentist may trigger trauma-reactions. However, informants in this study also describe how reactions recede once trust is achieved. For this

reason, once they have found a dental professional they feel understands, they attach great importance to the ability to retain that relationship of trust.

Limitations

Statistical generalizability was not an aim in this qualitative study. All informants were patients referred on grounds of oral health challenges. The severity of PTSD symptoms may have precluded the most mentally impaired torture victims from participating. However, the final sample of 10 informants represented a satisfactory range with regard to ages, genders, countries of origin, types of torture and dental treatment experienced, and was comparable to other qualitative studies involving torture victims (Isakson & Jurkovic, 2013; Taylor et al., 2013). Diversity was also present in the informants' differing capacity to reflect on their experiences and the modes in which such reflection was articulated.

Restricting to fluent Norwegian- or English speakers was not feasible, given the limited population from which the informants were recruited. The disadvantages from interpretation was mitigated by using professional, experienced interpreters, and an interviewer who was experienced in communicating through interpreters. Nevertheless, the use of non-native languages in research interviews may impede the expression and interpretation of nuances of meaning. On the other hand, this circumstance also prompts deliberate probing and discussion of concepts and terms, thus potentially strengthening exploratory capacity.

To implement the study, it was an advantage that the interviewer, being a dentist, had prior knowledge of the subject and the circumstances. However, this entails a risk of subjective bias or interpretations errors. Professional assumptions and possible blind spots that might results from the first author being a dentist, was counterbalanced by all authors taking an active part in the planning of the study and the analysis of the material to ensure multiple perspectives.

Moreover, there was only one interview with each informant, on a theme that included also previously unarticulated reflections on personal experiences. Hence, participants may have had new reflections subsequent to the interview, and talking to them again might have shed further light on the topic. However, due to the psychological strain it was to some of the informants to go through with the interview, a follow-up would not be ethically justifiable.

Conclusions and implications

The present study provides new knowledge about the process that complicates torture victims' ability to engage in and tolerate dental procedures, and points to the activation or aggravation of trauma-related reactions as a major challenge. To surrender to dental treatment means to give in to being suspended albeit temporarily in an objectified position, acted upon by subjects capable of producing deeply undesirable mental, emotional and bodily states. We have pointed to pain, traumatic memories and the dentist as the most prominent factors with such an agentic capacity.

All professionals who work with torture victims should be aware that these individuals often suffer from comprehensive oral health problems that affect their quality of life on many levels. Although dental care may be desperately needed, the perceived parallels between the dental treatment and the patients' previous torture experiences, may activate severe physical and psychological reactions. Thus, dental visits are either avoided or suffered through, with the risk of immediate or lasting consequences.

The clinical implications for dental health personnel that may be drawn from the present study are important and worthy of further exploration. However, some preliminary recommendations may be outlined: First, the dentist should have the understanding of who may be a potential torture victim, and have knowledge about common challenges faced. Enough time must be reserved to ensure a thorough report, however without the dentist prying into the details of the torture experiences. Trauma reactions are set off by different stimuli depending on personal experiences, hence triggers need to be explored individually. Furthermore, always giving a heads up about everything that will happen is important to ensure predictability and increase the patient's sense of control and agency. Finally, all dentists working with traumatized individuals have to know how to handle psychological reactions – to know how to bring the patient back to 'here and now'.

Professionals such as social workers, psychologists, physicians and physical therapists, should be encouraged to ask their clients about oral health, and offer to help with further referral. At the same time they should keep in mind that, although dental treatment is clinically necessary, it may represent a major challenge if the patient is not met with the necessary psychological insight. Thus, the referral should include parts of the patient's trauma history relevant for dental care, and the designated dentist should be familiar with the principles of trauma-informed care. Collaboration between professional groups is important in the rehabilitation of torture victims, and is best achieved when all providers understand the patients' needs.

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Paper IV