Aim The aim of this paper was to review the published scientific literature to quantify the prevalence and mean score of dental fear/anxiety (DFA) in children/adolescents and its variation according to several variables. Materials and methods Cross-sectional and cohort studies published from 2000 to 2014, that measured DFA in children/adolescents (aged 0-19 years), in the general population, or visiting private or public dental services (general or pediatric) or attending school and kindergarten, were searched, with specific terms, in 3 electronic databases (Medline, Embase, Web Of Science). Primary data, collected with specific questionnaires of demonstrated reliability and/or validity, were extracted. Results After screening 743 abstracts and evaluating 164 full-text publications, 36 articles were selected. Dental fear/anxiety prevalence rates were 12.2%, 10.0%, 12.2%, 11.0% and 20.0% for the CFSS-DS, DAS, MDAS, DFS, and DFSS-SF scores, respectively. In the studies that used MCDAS Dental fear/prevalence rates varied from 13.3% to 29.3%. In the studies that used CFSS-DS ratings, the prevalence and the mean score of dental fear/anxiety was lower in Northern Europe than the remaining countries, the prevalence decreased with increasing age and the frequency was higher in females than males. Conclusions Dental fear/anxiety is a common problem in children/adolescents worldwide, therefore, new strategies to overcome this relevant children/adolescent condition should be encouraged.

Keywords Children/adolescents; Dental fear/anxiety; Prevalence.

Introduction

Dental fear usually refers to a normal unpleasant emotional reaction to specific threatening stimuli occurring in situations associated with dental treatment, while dental anxiety is an excessive and unreasonable negative emotional state experienced by dental patients. These psychological states consist of apprehension that something dreadful is going to happen in relation to dental treatment. Dental fear and dental anxiety are often used indistinctly in the scientific literature, but they represent different progressive degrees of the same psychological condition. The terms dental fear and anxiety (DFA) will be used throughout this review when we refer to strong negative emotions associated with dental treatment among children and adolescents Klingberg and Broberg, 2007]. This abnormal childhood or adolescent dental anxiety sometimes can be linked to a series of uncooperative or troublesome behaviours [Wogelius et al., 2003; Kyritsi et al., 2009; Gustafsson et al., 2010; Salem et al., 2012]. When clinicians treat patients with dental anxiety, the former are inevitably subjected to increased stress [Moore and Brodsgaard, 2001], with more time-consuming treatments, increased costs and other difficulties encountered during their dental practice [Rafique et al., 2008]. This dental-associated fear – with various degrees of severity – is a phenomenon described in studies carried out in different geographic areas, such as Western Europe [Caprioglio et al, 2009] the UK [Howard and Freeman, 2008], Denmark [Wogelius and Poulsen, 2005], Finland [Milen et al., 1990], Sweden [Gustafsson et al., 2010; Klingberg, 1995], Africa (Niger [Ajayi and Arigbede, 2012]), South America (Brasil [Colares et al., 2013]), Asia (Iran [Salem et al., 2012], Israel [Peretz and Khrorouba, 2013], Taiwan [Lee et al., 2009], Japan [Nakai et al., 2005]) and Australia [Armfield, 2013]. Lack of oral health [Fayans, 1989; Cinar and Murtomaa, 2007; Gustafsson et al., 2010; Bezabih et al., 2013; Colares et al., 2013; Muppa et al., 2013], as well as poor oral health in children and adolescents [Avesalo et al., 1993; Kruger et al., 1998; Akbay Oba et al., 2009; Olak et al., 2013] motivated our interest in this psychological condition and its early detection. There are three methods to measure dental anxiety: (a) “behavioural assessment”, in which

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**ABSTRACT**

**Aim** The aim of this paper was to review the published scientific literature to quantify the prevalence and mean score of dental fear/anxiety (DFA) in children/adolescents and its variation according to several variables. **Materials and methods** Cross-sectional and cohort studies published from 2000 to 2014, that measured DFA in children/adolescents (aged 0-19 years), in the general population, or visiting private or public dental services (general or pediatric) or attending school and kindergarten, were searched, with specific terms, in 3 electronic databases (Medline, Embase, Web Of Science). Primary data, collected with specific questionnaires of demonstrated reliability and/or validity, were extracted. **Results** After screening 743 abstracts and evaluating 164 full-text publications, 36 articles were selected. Dental fear/anxiety prevalence rates were 12.2%, 10.0%, 12.2%, 11.0% and 20.0% for the CFSS-DS, DAS, MDAS, DFS, and DFSS-SF scores, respectively. In the studies that used MCDAS Dental fear/prevalence rates varied from 13.3% to 29.3%. In the studies that used CFSS-DS ratings, the prevalence and the mean score of dental fear/anxiety was lower in Northern Europe than the remaining countries, the prevalence decreased with increasing age and the frequency was higher in females than males. **Conclusions** Dental fear/anxiety is a common problem in children/adolescents worldwide, therefore, new strategies to overcome this relevant children/adolescent condition should be encouraged. **Keywords** Children/adolescents; Dental fear/anxiety; Prevalence.
the dental team or researchers are asked to rate both the emotional and behavioural reactions shown by the children during treatment; (b) "psychometric assessment" in which the children or one of their parents have to complete a questionnaire, usually before the treatment, to indicate the child's level of anxiety associated with various common dental situations; (c) "physiological response analysis" in which variations of parameters linked to anxiety are measured, such as salivary cortisol levels [Porrit et al., 2013]. Psychometric assessments, using questionnaires, is the most common and easy measuring methods of childhood and adolescent DFA [Porrit et al., 2013].

The aim this systematic review is to determine the distribution and level of DFA during childhood and adolescence. Specifically this review aims to determine (a) the prevalence of DFA in children and adolescents; (b) the mean level of DFA in children and adolescents; and (c) how the prevalence and the mean level of DFA vary with age, gender, country, setting, questionnaire respondent (parent or child), and the threshold anxiety score (cut-off).

Methods

Inclusion criteria

Study design: Review of the literature. We included only cross-sectional and cohort studies that measured the prevalence and mean score of DFA and its variation with the abovementioned variables. Studies that did not report prevalence data, were not included. Population and setting: Children and adolescents (aged 0–19 years), belonging to the general population or visiting private or public dental services (general or paediatric) or attending school and kindergarten. Endpoints: Primary data, collected through psychometric evaluations with specific questionnaires, of demonstrated reliability and/or validity, clearly showing anxiety cut-off values and intelligible 5 points response scoring scales (e.g., Likert scale, Facial image scale), were extracted. The questionnaires having the aforementioned features, included in this review and listed in Table 1, were the following: Children's Fear Survey Schedule-Dental Subscale (CFSS-DS), Dental Fear Schedule Subscale-Short Form (DFSS-SF), Dental Anxiety Scale (DAS), Modified Corah Dental Anxiety Scale (MDAS), Modified Child Dental Anxiety Scale (MCDAS), Dental Fear Survey (DFS), and Modified Dental Fear Survey in two versions of 15 or 20 items (MDFS) [Porrit et al, 2013].

Exclusion criteria

Editorials, case reports and retrospective studies were excluded. Studies including wide age group ranges with no specific data for the target group (aged 0–19 years) were excluded. Studies including fewer than 50 individuals, studies with patients undergoing general anesthesia or conscious sedation or referred by other dental practitioners, and studies where the selection of patients did not have a population-based approach or

<table>
<thead>
<tr>
<th>CFSS-DS</th>
<th>1 Dentists</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Doctors</td>
<td></td>
</tr>
<tr>
<td>3 Injections</td>
<td></td>
</tr>
<tr>
<td>4 Having somebody examine your mouth</td>
<td></td>
</tr>
<tr>
<td>5 Having to open your mouth</td>
<td></td>
</tr>
<tr>
<td>6 Having a stranger touch you</td>
<td></td>
</tr>
<tr>
<td>7 Having somebody look at you</td>
<td></td>
</tr>
<tr>
<td>8 The dentist drilling</td>
<td></td>
</tr>
<tr>
<td>9 The sight of the dentist drilling</td>
<td></td>
</tr>
<tr>
<td>10 The noise of the dentist drilling</td>
<td></td>
</tr>
<tr>
<td>11 Having somebody put instruments in your mouth</td>
<td></td>
</tr>
<tr>
<td>12 Choking</td>
<td></td>
</tr>
<tr>
<td>13 Having to go to the hospital</td>
<td></td>
</tr>
<tr>
<td>14 People in white uniform</td>
<td></td>
</tr>
<tr>
<td>15 Having the dentist clean your teeth</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DFSS-SF</th>
<th>3 Three out of the 15 item of CFSS-DS were omitted (n.3,7 and 14) and one is added : fear of dental treatment causing pain“</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 If you had to go to the dentist tomorrow, how would you feel?</td>
<td></td>
</tr>
<tr>
<td>2 When you are in the waiting room waiting for the dentist to call you, how do you feel?</td>
<td></td>
</tr>
<tr>
<td>3 When you are in the dentist's chair waiting for the local anesthesia procedures, how do you feel?</td>
<td></td>
</tr>
<tr>
<td>4 You are in the dentist’s chair, already anesthetized. While you are waiting for the dentist to get the instruments to begin the procedure, how do you feel?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DAS</th>
<th>5 At four items of DAS the following question has been added: “when you are in the dentist's chair waiting for dentist to begin dental procedures, how do you feel?“</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 If you had to go to the dentist tomorrow, how would you feel?</td>
<td></td>
</tr>
<tr>
<td>2 How do you feel about having your teeth looked at?</td>
<td></td>
</tr>
<tr>
<td>3 How do you feel about having your teeth scraped and polished?</td>
<td></td>
</tr>
<tr>
<td>4 How do you feel about having an injection in the gum?</td>
<td></td>
</tr>
<tr>
<td>5 How do you feel about having a filling?</td>
<td></td>
</tr>
<tr>
<td>6 How do you feel about having a tooth taken out?</td>
<td></td>
</tr>
<tr>
<td>7 How do you feel about having being put to sleep to have treatment?</td>
<td></td>
</tr>
<tr>
<td>8 How do you feel about having a mixture of &quot;gas and air&quot; which will help you feel comfortable for treatment but cannot put you to sleep?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MDAS</th>
<th>8 At MDAS four items the following 5 questions have been omitted (n.3,7 and 14) and one is added : fear of dental treatment causing pain“</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 How do you feel about going to the dentist generally?</td>
<td></td>
</tr>
<tr>
<td>2 How do you feel about having your teeth looked at?</td>
<td></td>
</tr>
<tr>
<td>3 How do you feel about having your teeth scraped and polished?</td>
<td></td>
</tr>
<tr>
<td>4 How do you feel about having a filling?</td>
<td></td>
</tr>
<tr>
<td>5 How do you feel about having a tooth taken out?</td>
<td></td>
</tr>
<tr>
<td>6 How do you feel about your teeth being touched?</td>
<td></td>
</tr>
<tr>
<td>7 How do you feel about your teeth being cleaned?</td>
<td></td>
</tr>
<tr>
<td>8 How do you feel about having a mixture of &quot;gas and air&quot; which will help you feel comfortable for treatment but cannot put you to sleep?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MDFS</th>
<th>15 Making an appointment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Approaching the dental office</td>
<td></td>
</tr>
<tr>
<td>3 Sitting in the waiting room</td>
<td></td>
</tr>
<tr>
<td>4 Being seated in the dental chair</td>
<td></td>
</tr>
<tr>
<td>5 Smell of the dental office</td>
<td></td>
</tr>
<tr>
<td>6 Seeing in the dentist walk in</td>
<td></td>
</tr>
<tr>
<td>7 Having oral examination</td>
<td></td>
</tr>
<tr>
<td>8 Seeing the injection needle</td>
<td></td>
</tr>
<tr>
<td>9 Feeling the needle injection</td>
<td></td>
</tr>
<tr>
<td>10 Seeing the drill</td>
<td></td>
</tr>
<tr>
<td>11 Hearing the drill</td>
<td></td>
</tr>
<tr>
<td>12 Feeling the drill</td>
<td></td>
</tr>
<tr>
<td>13 Having the teeth cleaned</td>
<td></td>
</tr>
<tr>
<td>14 Feeling pain after oral anesthesia</td>
<td></td>
</tr>
<tr>
<td>15 Overall fear of dental work</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DFS</th>
<th>20 At 15 items of MDFS the following 5 questions have been added: when having work done</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 My muscles become tense</td>
<td></td>
</tr>
<tr>
<td>2 My breathing rate increases</td>
<td></td>
</tr>
<tr>
<td>3 I perspire</td>
<td></td>
</tr>
<tr>
<td>4 I feel nauseated and sick to my stomach</td>
<td></td>
</tr>
<tr>
<td>5 My heart beats faster</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CFSS-DS</th>
<th>1 Children's Fear Survey Schedule-Dental Subscale</th>
</tr>
</thead>
<tbody>
<tr>
<td>2DFSS-SF</td>
<td>Dental Fear Schedule Subscale-Short Form</td>
</tr>
<tr>
<td>3DAS</td>
<td>Dental Anxiety Scale</td>
</tr>
<tr>
<td>4MDAS</td>
<td>Modified Corah Dental Anxiety Scale</td>
</tr>
<tr>
<td>5MCDAS</td>
<td>Modified Child Dental Anxiety Scale</td>
</tr>
<tr>
<td>6MDFS</td>
<td>Modified Dental Fear Scale - DFS</td>
</tr>
</tbody>
</table>

TABLE 1 Types and descriptions of questionnaires in the studies.

did not use well-defined measures of fear/anxiety were excluded. In addition, studies employing a behavioural assessment or physiological response analysis, to measure childhood and adolescent dental anxiety, were excluded.
**Literature search**

We developed a detailed search strategy for Medline, but revised it appropriately for each database (Medline, Embase, Web Of Science). The following terms were used to formulate the search strategies: dental fear* OR dental anx* OR dental phobia* AND Prevalence OR Cohort studies OR Longitudinal studies OR Cross-Sectional Studies OR Mass Screening (Table 2).

**Studies selection**

After launching the search strategy, we imported the records from each database into the bibliographies software package EndNote X7 and merged them into one core database. Duplicate records were subsequently removed. When searching other sources (e.g., reference lists of relevant trials, reviews, articles and textbooks), we obtained all potentially relevant reports that were identified. Two reviewers (GL, AM) independently carried out a systematic screening of the titles and abstracts of the retrieved records. The search was limited to studies published in English language between 2000 and March 2014. We obtained the full text of studies that potentially fulfilled the inclusion criteria. Disagreements were resolved by discussion. Where resolution was not possible, a third reviewer was consulted (IA).

**Data extraction and management**

Two reviewers (GL, MO) independently extracted data, and disagreements were resolved by discussion with a third review author. The data extraction sheet was prepared and tested. Information regarding study characteristics (year of publication, country and setting of the study), patients’ characteristics (number of participants, age, gender), the psychometric assessment method, the mean score and prevalence data, were collected.

**Analysis**

Crude prevalence estimates (number of cases/sample size), along with standard errors, were extracted. Prevalence rates were transformed to logit estimates using the following formula: \(lp = \ln \left( \frac{p}{1 - p} \right)\), where \(lp = \) logit event estimate; \(ln = \) natural logarithm; \(p = \) study level estimate [Williams et al., 2006; Calvo-Munoz et al., 2013]. The DerSimonian and Laird random effects model was used to pool logit event estimates [1986]. Pooled logit estimates were subsequently transformed to prevalence estimates by the following formula: \(p = e^{lp} / (e^{lp} + 1)\): where \(p = \) prevalence and \(e = \) the base of natural logarithm [Gebremedhin and Tadesse, 2015]. The heterogeneity of the prevalence rates was assessed using the I2 index [Higgins and Thompson, 2002].

**Results**

The search strategy identified 743 records. After removing 118 duplicates, 625 records were evaluated. Prevalence rates were transformed to logit estimates and prevalence studies and one was a longitudinal study. The characteristics of the studies in terms of child and adolescent population, the setting, the prevalence and mean score of dental fear and type of respondent (child and/or adult) as well as the cut-off used are illustrated in Table 4 based on the type of questionnaire.

### Table 2

<table>
<thead>
<tr>
<th>Ovid Medline (R)</th>
<th>Embase</th>
<th>Web of Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. dental anx*.mp. #1.dental AND anx*</td>
<td>#1 top. (dental anx*)</td>
<td></td>
</tr>
<tr>
<td>2. dental fear*.mp. #2. dental AND fear*</td>
<td>#2 top. (dental fear*)</td>
<td></td>
</tr>
<tr>
<td>3. dental phobia*.mp. #3. dental AND phobia</td>
<td>#3 top. (dental phobia*)</td>
<td></td>
</tr>
<tr>
<td>4. odontophobia*.mp. #4. odontophobia*</td>
<td>#4 top. (odontophobia*)</td>
<td></td>
</tr>
<tr>
<td>5. exp Dental Anxiety/ #5. ‘dental anxiety’/exp</td>
<td>#5 (#4 OR #3 OR #2 OR #1)</td>
<td></td>
</tr>
<tr>
<td>6. 1 or 2 or 3 or 4 or 5</td>
<td>#6. ‘1 or 2 or 3 or 4 or 5’</td>
<td></td>
</tr>
<tr>
<td>7. Prevalence/ #7. ‘prevalence’/exp</td>
<td>#7 top. (Cross-Sect. Studies)</td>
<td></td>
</tr>
<tr>
<td>8. Cohort studies/ #8. ‘cohort analysis’/exp</td>
<td>#8 top. (Cohort Studies)</td>
<td></td>
</tr>
<tr>
<td>9. Longitudinal studies/ #9. ‘cohort analysis’/exp</td>
<td>#9 top. (Longitud. studies)</td>
<td></td>
</tr>
<tr>
<td>10. Cross-Sectional Studies/ #10. ‘longitudinal study’/exp</td>
<td>#10 top. (Mass Screening)</td>
<td></td>
</tr>
<tr>
<td>11. Mass Screening/ #11. ‘mass screening’/exp</td>
<td>#11 top. (#10 OR #9 OR #8)</td>
<td></td>
</tr>
<tr>
<td>12. Multiphasic Screening/</td>
<td>#12. #7 or 8 or 9 or 10 or 11</td>
<td>#11 top. (OR #7 OR #6)</td>
</tr>
<tr>
<td>13. 7 or 8 or 9 or 10 or 11 or 12</td>
<td>#13. 6 AND 12</td>
<td>#12 top. (#11 AND #5)</td>
</tr>
<tr>
<td>14. 6 and 13</td>
<td>#14. 13 AND embase/lim</td>
<td></td>
</tr>
<tr>
<td>15. limit 14 to yr=&quot;2000&quot;-Current&quot;</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Records: 169</td>
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<td></td>
</tr>
<tr>
<td>Study ID</td>
<td>Reason</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>The questionnaire considered was not of interest</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Age above 18 years</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Age above 18 years</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Age above 18 years</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Not present outcomes of interest</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Absence of dental fear prevalence data</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Age above 18 years</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Absence of dental fear prevalence data</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Absence of dental fear prevalence data</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Age above 18 years</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Children with behaviour management problems</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Threshold and mean values not reported</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>Absence of dental fear prevalence data</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Children with dental trauma</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>Children with attention deficit hyperactivity disorder</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Children with attention deficit hyperactivity disorder</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Children with identified behavior and learning problems</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>Born preterm children</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>Questionnaire used not of interest</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>The cut off matches the mean score of population dental fear</td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>Absence of dental fear prevalence data</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>Spanish language</td>
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</tr>
<tr>
<td>Y</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>Not present outcomes of interest</td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>Age above 18 years</td>
<td></td>
</tr>
<tr>
<td>A2</td>
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<td></td>
</tr>
<tr>
<td>A3</td>
<td>Absence of dental fear prevalence data</td>
<td></td>
</tr>
<tr>
<td>A4</td>
<td>Absence of dental fear prevalence data</td>
<td></td>
</tr>
<tr>
<td>A5</td>
<td>Subjects were 16–82 years of age</td>
<td></td>
</tr>
<tr>
<td>A6</td>
<td>Not present questionnaires and outcomes of interest</td>
<td></td>
</tr>
<tr>
<td>A7</td>
<td>Not present outcomes of interest</td>
<td></td>
</tr>
<tr>
<td>A8</td>
<td>Adolescents with history of childhood dental sedation</td>
<td></td>
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<td>A9</td>
<td>Absence of dental fear prevalence data</td>
<td></td>
</tr>
<tr>
<td>A10</td>
<td>Patients referred because of their dental fear</td>
<td></td>
</tr>
<tr>
<td>A11</td>
<td>Absence of dental fear prevalence data</td>
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</tr>
<tr>
<td>A12</td>
<td>Age above 18 years</td>
<td></td>
</tr>
<tr>
<td>A13</td>
<td>Subjects were 15-54 years of age</td>
<td></td>
</tr>
<tr>
<td>A14</td>
<td>Not present outcomes of interest</td>
<td></td>
</tr>
<tr>
<td>A15</td>
<td>Age above 18 years</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 3** Studies removed with reason.
<table>
<thead>
<tr>
<th>Study ID</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>Lopes 2013 Not present outcomes of interest</td>
</tr>
<tr>
<td>64</td>
<td>Lundgren 2001 Age above 18 years</td>
</tr>
<tr>
<td>65</td>
<td>Luoto 2009 Children with cleft lip and/or palate</td>
</tr>
<tr>
<td>66</td>
<td>Luoto 2010 Questionnaire used not of interest</td>
</tr>
<tr>
<td>67</td>
<td>Majstorovic 2001 Children with experience of dental trauma</td>
</tr>
<tr>
<td>68</td>
<td>Majstorovic 2003 Patients referred because of their dental fear</td>
</tr>
<tr>
<td>69</td>
<td>Majstorovic 2004 Not present outcomes of interest</td>
</tr>
<tr>
<td>70</td>
<td>Majstorovic 2007 Absence of dental fear prevalence data</td>
</tr>
<tr>
<td>71</td>
<td>Marya 2012 Absence of dental fear prevalence data</td>
</tr>
<tr>
<td>72</td>
<td>Marsac 2008 Not present outcomes of interest</td>
</tr>
<tr>
<td>73</td>
<td>McGrath 2004 Age between 16-64</td>
</tr>
<tr>
<td>74</td>
<td>Mckennautsch 2007 Patients number is lower than 50</td>
</tr>
<tr>
<td>75</td>
<td>Milsom 2003 Questionnaire used not of interest</td>
</tr>
<tr>
<td>76</td>
<td>Mora Leon 2000 Spanish language</td>
</tr>
<tr>
<td>77</td>
<td>Mungara 2013 Absence of dental fear prevalence data</td>
</tr>
<tr>
<td>78</td>
<td>Mustafa 2013 Patients referred by generalists because of dental fear</td>
</tr>
<tr>
<td>79</td>
<td>Naoumova 2012 Orthodontic patients</td>
</tr>
<tr>
<td>80</td>
<td>Nakay 2005 Absence of dental fear prevalence data</td>
</tr>
<tr>
<td>81</td>
<td>Newton 2000 Review</td>
</tr>
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<td>82</td>
<td>Newton 2005 Age above 18 years</td>
</tr>
<tr>
<td>83</td>
<td>Nuttal 2008 Questionnaire used not of interest</td>
</tr>
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<td>84</td>
<td>Pekkan 2011 Age above 18 years</td>
</tr>
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<td>85</td>
<td>Peretz 2000 Age above 18 years</td>
</tr>
<tr>
<td>86</td>
<td>Peretz 2013 Absence of dental fear prevalence data</td>
</tr>
<tr>
<td>87</td>
<td>Pickrell 2007 Children in need of two restorative treatment visits</td>
</tr>
<tr>
<td>88</td>
<td>Porrit 2012 Absence of dental fear prevalence data</td>
</tr>
<tr>
<td>89</td>
<td>Porrit 2013 Review</td>
</tr>
<tr>
<td>90</td>
<td>Poulton 2001 Questionnaire used not of interest</td>
</tr>
<tr>
<td>91</td>
<td>Pretty 2011 Age above 18 years</td>
</tr>
<tr>
<td>92</td>
<td>Ragnarsson 2003 Age &gt; 18 years and questionnaire used not of interest</td>
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<tr>
<td>93</td>
<td>Rantavuori 2004 Questionnaire used not of interest</td>
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<th>Study ID</th>
<th>Reason</th>
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<td>Rantavuori 2005 Not present outcomes of interest</td>
</tr>
<tr>
<td>95</td>
<td>Rantavuori 2012 Questionnaire used not of interest</td>
</tr>
<tr>
<td>96</td>
<td>Rantavuori 2013 Not present questionnaires of interest</td>
</tr>
<tr>
<td>97</td>
<td>Riddel 2007 The sample originated from a retrospective cohort</td>
</tr>
<tr>
<td>98</td>
<td>Settineri 2010 Age above 18 years</td>
</tr>
<tr>
<td>99</td>
<td>Shierz 2008 Questionnaire used not of interest</td>
</tr>
<tr>
<td>100</td>
<td>Shuller 2003 Age between 35-65</td>
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<tr>
<td>101</td>
<td>Sjogren 2010 Children with orthodontic consultation</td>
</tr>
<tr>
<td>102</td>
<td>Skaret 2000 Not present outcomes of interest</td>
</tr>
<tr>
<td>103</td>
<td>Sing 2010 Absence of dental fear prevalence data</td>
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<td>Smith 2003 Review</td>
</tr>
<tr>
<td>105</td>
<td>Spivak 2004 Questionnaire used not of interest</td>
</tr>
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<td>106</td>
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</tr>
<tr>
<td>107</td>
<td>Stenebrand 2013_c Duplicate of Stenebrand 2013_a</td>
</tr>
<tr>
<td>108</td>
<td>Suprabha 2011 Children with caries</td>
</tr>
<tr>
<td>109</td>
<td>Tickle 2003 Questionnaire used not of interest</td>
</tr>
<tr>
<td>110</td>
<td>Tickle 2009 Questionnaire used not of interest</td>
</tr>
<tr>
<td>111</td>
<td>Thomson 2009 Outcomes of interest already published in Locker 2001</td>
</tr>
<tr>
<td>112</td>
<td>Tunc 2005 Age above 18 years</td>
</tr>
<tr>
<td>113</td>
<td>Veerkamp 2006 Dutch language</td>
</tr>
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<td>114</td>
<td>Versloot 2005 Children referred by other dentists needing local anaesthesia</td>
</tr>
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<td>115</td>
<td>Versloot 2008_a Children requiring two subsequent treatment sessions with local anaesthesia</td>
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<tr>
<td>116</td>
<td>Versloot 2008_b Age above 18 years</td>
</tr>
<tr>
<td>117</td>
<td>Vika 2006 Questionnaire used not of interest</td>
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<td>Vika 2009 Age above 18 years</td>
</tr>
<tr>
<td>119</td>
<td>Wigen 2009 Not present of questionnaire of interest</td>
</tr>
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<td>120</td>
<td>Wogelius 2003_b Duplicate of Wogelius 2003_a</td>
</tr>
<tr>
<td>121</td>
<td>Wogelius 2005 Not present outcomes of interest</td>
</tr>
<tr>
<td>122</td>
<td>Wogelius 2009 Survivors of childhood cancer</td>
</tr>
<tr>
<td>123</td>
<td>Woodmansey 2005 Age above 18 years</td>
</tr>
<tr>
<td>124</td>
<td>Wright 2010 Orthodontic patients</td>
</tr>
<tr>
<td>125</td>
<td>Yamada 2002 Patients referred for anxiety issues</td>
</tr>
<tr>
<td>126</td>
<td>Yan 2008 Age above 18 years</td>
</tr>
<tr>
<td>127</td>
<td>Yuzugullu 2014 Age above 18 years</td>
</tr>
<tr>
<td>128</td>
<td>Zhang 2013 Chinese language</td>
</tr>
</tbody>
</table>

**TABLE 3** Studies removed with reason.
each of the following countries: Belgium, Denmark, Greece, Italy, India, Iran, Norway, Spain, Turkey and USA. In seven studies, the questionnaires were administered within schools [Versloot et al., 2004; Lee et al., 2007; Akbay Oba et al., 2009; Caprioglio et al., 2009; Lara et al., 2012; Krikken a et al., 2013; Krikken b et al., 2013], whereas in the remaining 10 studies, 7 were performed in general clinical settings [Raadal et al., 2002; ten Berge et al., 2002; Baier et al., 2004; Majstorovic and Veerkamp, 2005; Klaassen et al., 2008; Lee et al., 2008; Salem et al., 2012] and 3 were specialised for children [Wogelius et al., 2003; Kyritsi et al., 2009; Chhabra et al., 2012]. The median population was 421 and the interquartile range (IQR) ranged from 218 to 725. The age of subjects varied from 0 to 13 years across the studies, with a mean age of 9.4. The threshold anxiety cut off score ranged from 29 to 45, while most studies had a cut off value of 38 (n =6). The pooled prevalence of DFA among the studies was 12.2% (95% CI 9.0-16.2; I²=97%). Only 10 studies provided the mean score and standard deviation. The pooled mean score was 26.2 (95% CI 24.0-28.4). The distribution and variability of the prevalence and the mean score of DFA based on the geographical area, the demographic characteristics, the setting, the type of informant and the used cut-off are depicted in Table 5 and Table 6, respectively.

**Dental Anxiety Scale (DAS)**

Five studies used the Dental Anxiety Scale (DAS) questionnaire [Locker et al., 2001; Dogan et al., 2006; Abu-Ghazaleh et al., 2011; Bezabih et al., 2013; de Carvalho et al., 2013; Ostberg and Abrahamsson, 2013]. All the studies were performed in different countries (Ethiopia, Brazil, Turkey, New Zealand, Sweden). Four studies were performed in general dental services [Abu-Ghazaleh et al., 2011; Carrillo-Diaz et al., 2012; Bezabih et al., 2013; de Carvalho et al., 2013] and 1 in a school [Dogan et al.,

<table>
<thead>
<tr>
<th>Autor ID</th>
<th>Country</th>
<th>Setting</th>
<th>Population</th>
<th>Age (range)</th>
<th>Type of respondent</th>
<th>Mean score of DFA</th>
<th>Prevalence of DFA</th>
<th>Cut off</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFSS-DS 15 item. range of scale :15-75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Akbay Oba 2009</td>
<td>Turkey</td>
<td>School</td>
<td>275 (M 146)</td>
<td>7-11</td>
<td>Children</td>
<td><strong>28.1</strong> (SD 9.193)</td>
<td><strong>14.5%</strong></td>
<td>≥38</td>
</tr>
<tr>
<td>Baier 2004</td>
<td>Greece</td>
<td>Clinic</td>
<td>421 (M221 )</td>
<td>0-13</td>
<td>Parents</td>
<td><strong>29.6</strong></td>
<td>20% (CI 16-24%)</td>
<td>≥38</td>
</tr>
<tr>
<td>Caprioglio 2009</td>
<td>Italy</td>
<td>School</td>
<td>725 (M 362)</td>
<td>6-10</td>
<td>Children</td>
<td>--</td>
<td>26 %</td>
<td>&gt;39</td>
</tr>
<tr>
<td>Chhabra 2012</td>
<td>India</td>
<td>Clinic</td>
<td>523 (M 272)</td>
<td>5-10</td>
<td>Parents</td>
<td>24</td>
<td>6.3%</td>
<td>&gt;38</td>
</tr>
<tr>
<td>Klassen 2008</td>
<td>Netherlands</td>
<td>Clinic</td>
<td>218 (M122 )</td>
<td>8-13</td>
<td>Parents</td>
<td><strong>23.17</strong> (SD 8.12)</td>
<td>13.7%</td>
<td>≥32</td>
</tr>
<tr>
<td>Krikken 2013_a</td>
<td>Netherlands</td>
<td>School</td>
<td>325 (M 160 )</td>
<td>7-11</td>
<td>Children</td>
<td><strong>21.9</strong> (SD 6.83)</td>
<td>10.5%</td>
<td>≥32</td>
</tr>
<tr>
<td>Krikken 2013_b</td>
<td>Netherlands</td>
<td>School</td>
<td>325 (M 160 )</td>
<td>7-11</td>
<td>Parents</td>
<td>23.3 (SD 6.65)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krikken 2013_b</td>
<td>Netherlands</td>
<td>School</td>
<td>454</td>
<td>4-13</td>
<td>Parents</td>
<td>21.79</td>
<td>2.4%</td>
<td>38</td>
</tr>
<tr>
<td>Kyritsi 2009</td>
<td>Greece</td>
<td>Clinic</td>
<td>88 (M 53 )</td>
<td>3-11</td>
<td>Parents</td>
<td>---</td>
<td>25%</td>
<td>35</td>
</tr>
<tr>
<td>Lara 2012</td>
<td>Spain</td>
<td>School</td>
<td>183 (M 94 )</td>
<td>7-12</td>
<td>Children</td>
<td><strong>27.42</strong> (SD9.46)</td>
<td>4.9%</td>
<td>≥45</td>
</tr>
<tr>
<td>Lee 2007</td>
<td>Taiwan</td>
<td>School / Kindergarten</td>
<td>3597</td>
<td>5-8</td>
<td>Children and Parents</td>
<td><strong>29.68</strong> (SD 10.91)</td>
<td>20.6%</td>
<td>≥38/39</td>
</tr>
<tr>
<td>Lee 2008</td>
<td>Taiwan</td>
<td>Not specified</td>
<td>247 (M135)</td>
<td>2-10.5</td>
<td>Parents</td>
<td><strong>35.31</strong> (SD 13.34)</td>
<td>(28.3%)</td>
<td>≥45</td>
</tr>
<tr>
<td>Majstorovic 2005</td>
<td>Netherlands</td>
<td>Clinic</td>
<td>1946 (M 1007)</td>
<td>4-11</td>
<td>Parents</td>
<td>------</td>
<td>24.46%</td>
<td>---</td>
</tr>
<tr>
<td>Raadal 2002</td>
<td>Norway</td>
<td>Clinic</td>
<td>180 (M 92 )</td>
<td>10</td>
<td>Children</td>
<td><strong>22.5</strong> (SD 6.8)</td>
<td>12%</td>
<td>&gt;29 (1st dev above mean)</td>
</tr>
<tr>
<td>Salem 2010</td>
<td>Iran</td>
<td>Clinic</td>
<td>200 (M106)</td>
<td>3-6</td>
<td>Parents</td>
<td><strong>32.1</strong></td>
<td>22%</td>
<td>&gt;38</td>
</tr>
<tr>
<td>ten Berg 2002</td>
<td>Netherlands</td>
<td>Clinic</td>
<td>2144 (M1107)</td>
<td>4-11</td>
<td>Parents</td>
<td><strong>23.9</strong> (SD 8.1)</td>
<td>6%</td>
<td>≥38</td>
</tr>
<tr>
<td>Wogelius 2003_a</td>
<td>Denmark</td>
<td>Clinic</td>
<td>1281</td>
<td>6-8</td>
<td>Parents</td>
<td><strong>23.8</strong></td>
<td>5.7%</td>
<td>≥38</td>
</tr>
</tbody>
</table>

**TABLE 4A** Characteristics of the included studies.
An Algesia, sedation and medical emergencies for paediatric dental patients

The mean score of DFA was 12.5 (95% CI 10.6-14.4; I²=97%) in one study, but it was not reported in another study. The pooled prevalence of the DFA was 11.0% (95% CI 6.0-20.0; I²=96%). The mean score was 34.2 and 44.2 in two studies, respectively.

The pooled prevalence among the included studies was 12.2% (95% CI 6.0-23.0; I²=96%). The mean score was 12.6 years. The pooled prevalence of the DFA among children varied from 13.3% to 29.3%. The mean score of DFA ranged from 18.1 to 20.81.

TABLE 4B Characteristics of the included studies.

<table>
<thead>
<tr>
<th>Autor ID</th>
<th>Country</th>
<th>Setting</th>
<th>Population</th>
<th>Age (range)</th>
<th>Type of respondent</th>
<th>Mean score of DFA</th>
<th>Prevalence of DFA</th>
<th>Cut off</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abu-Ghazaleh 2011</td>
<td>Jordan</td>
<td>School</td>
<td>1415 (M 690)</td>
<td>15-16</td>
<td>Adolescents</td>
<td>13.91 (SD 5.36)</td>
<td>22.6%</td>
<td>≥19</td>
</tr>
<tr>
<td>Carrillo-Diaz 2012</td>
<td>Spain</td>
<td>Clinic</td>
<td>147 (M 59)</td>
<td>8-16</td>
<td>Children/ Adolescents</td>
<td>12.57 (SD 4.98)</td>
<td>13.6%</td>
<td>≥19</td>
</tr>
<tr>
<td>Jaakkola 2013</td>
<td>Finland</td>
<td>Home</td>
<td>777</td>
<td>18</td>
<td>Adolescents</td>
<td>---</td>
<td>7.6%</td>
<td>≥19</td>
</tr>
<tr>
<td>Carrillo-Diaz 2013</td>
<td>Spain</td>
<td>School</td>
<td>161 (M 84)</td>
<td>7-14</td>
<td>Children/ Adolescents</td>
<td>10.95 (SD 4.7)</td>
<td>8.70%</td>
<td>≥19</td>
</tr>
</tbody>
</table>

Modified Child Dental Anxiety Scale (MCDAS) 8 item; range of scale: 8-40

| Paryab 2013 | India | Clinic | 150 (M 66) | 6-12 | Children | 8 item 20.81 (SD 6.97) | 29.3% | ≥26 |
| Skaret 2007, Vika 2008 | Norway | School | 1385 (M 615) | 18 | Adolescents | 44.2 (SD 17.6) | 19.8% | ≥62 |
| Stenebrand, a 2013, Stenebrand, b 2013 | Sweden | School | 216(M115) | 15 | Adolescents | 34.2 (SD 14.9) | 6.5% | ≥60 |
| Taani 2002, Taani 2005d | Jordan | School | 1021 (M 460) | 12-15 | Adolescents | --- | 10% | Unclear |
| DFSS-SF 8 item; range of scale: 8-40
| Foloyan 2003 | Nigeria | Clinic | 81 (M40) | 8-13 | Children | 15.32 (SD 5.07) | 14.8% | 1 st. dev.t. above mean |
| Foloyan 2004c | Nigeria | Clinic | 69 (M 39) | 8-13 | Children | 15.68 (SD 5.62) | 26.1% | ≥20 |
| Olak 2013 | Estonia | School | 344 (M 188) | 8-10 | Children | 15.4 (SD 4.6) | 16.5% | ≥20 (1 st. dev above mean) |

**Modified Corah Dental Anxiety Scale (MDAS)**

Four studies evaluating the prevalence of DFA in children, using the Modified Corah Dental Anxiety Scale (MDAS), were identified [Paryab and Hosseinbor, 2013; Wong et al., 1998]. One study was conducted in India (n=1) in a school and one in England in a general dental clinic. The number of the children varied from 150 to 277. The age ranged from 6 to 15 years across the studies. The prevalence of the DFA among the studies varied from 13.3% to 29.3%. The mean score of DFA ranged from 18.1 to 20.81.

**Dental Fear Survey (DFS)**

Three studies, in 6 publications, that used the DFS, for dental fear assessment, were identified [Stenebrand et al., 2013; Stenebrand et al., 2013; Taani, 2002; Taani et al., 2005; Skaret et al., 2007; Vika et al., 2008]. All the studies were cross-sectional in design and were performed in the same setting (school), but in different countries (Norway, Sweden, Jordan). The median number of the included subjects was 1021 with an IQR ranged from 216 to 1385. In one study, in two publications [Skaret et al., 2007; Vika et al., 2008], the subjects were 18 years old. In the second study, the subjects were 15 years old and in the third study, the age ranged from 12 to 15 years. The threshold anxiety cut-off was 60 and 62 for two studies and was unclear in one. The pooled prevalence of the DFA was 11.0% (95% CI 6.0-20.0; I²=96%). The mean score was 34.2 and 44.2 in the two studies, but it was not reported in one study.

**Dental Fear Schedule Subscale-Short Form (DFSS-SF)**

Three studies used the DFSS-SF to assess DFA. Two
studies were performed in Nigeria, one in a pediatric dental setting [Folayan et al., 2003; Folayan et al., 2004], and the other in a general dental clinic clinic [Olak et al., 2013]. The third study was performed in Estonia in a school 26. The median number of children included was 81, with an IQR ranged from 69 to 333. The age ranged from 8 to 13 years among the studies, with a mean age of 9.3 years in Olak 2013 and 10.9 years in the other two studies [Folayan et al., 2003; Folayan et al., 2004]. The threshold anxiety cut off was 18 in one study and 20 in two studies. The pooled prevalence across the studies was 20% (95% CI 15.1-26.9; I2=51.2). The mean score of dental fear using the DFFS-SF was 15.4 (95% CI 15-15.9; I2=0%).

**Discussion**

In this review, we performed a comprehensive systematic search of studies that reported the prevalence of dental fear in children and adolescents younger than 19 years old. We identified 34 studies, in 36 publications, that measured dental fear and anxiety employing the most frequently used questionnaires, as suggested by Porrit [2013]. The main conclusion is that dental fear is a common problem in children and adolescents among several countries in Europe, Asia, Africa and North America. The pooled prevalence varied between 10% and 20%.

The studies utilised different types of questionnaires. In the studies that used DFSS-SF, DFS, DAS, MDAS, MCDAS and CFSS-DS questionnaires, the prevalence rates were similar, ranging from 10% to almost 13%. Three studies used the DFSS-SF questionnaire, which when combined, led to a pooled prevalence of 20%. In the studies that used MCDAS Dental fear prevalence rates were very heterogeneous varying from 13.3% to 29.3%. The complete data synthesis of either Dental Fear prevalence and mean score and its related variables was reported in Table 4. The results were highly heterogeneous, most probably due to the study design, the sampling methods, the setting and the application of the questionnaire, as well as cultural attitudes and socio-economical variations.

**Variation in prevalence and mean score**

The assessment of variations in DFA prevalence, measured with different scales, and the factors, such as the gender and the age of children/adolescents, the country, the setting, the questionnaire respondent (parents or child), and the threshold anxiety score (cut off), that may explain the variability, was reported in almost all studies. We will limit the discussion to those studies that used the CFSS-DS, given that it was the most utilized scale. The synthesis of data measured with CFSS-DS were reported in Table

<table>
<thead>
<tr>
<th>Type of Variable</th>
<th>Prevalence</th>
<th>Studies (n.)</th>
<th>Patients (n.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Geographical areas</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nord Europe</td>
<td>11.1%</td>
<td>8</td>
<td>996</td>
</tr>
<tr>
<td>Sud-Center Europe</td>
<td>21.9%</td>
<td>3</td>
<td>7145</td>
</tr>
<tr>
<td>Asia</td>
<td>19.2%</td>
<td>5</td>
<td>4842</td>
</tr>
<tr>
<td>Usa</td>
<td>20.2%</td>
<td>1</td>
<td>421</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--</td>
<td>Decrease with increase of age</td>
<td>5</td>
<td>6575</td>
</tr>
<tr>
<td>--</td>
<td>Increase with increase of age</td>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>--</td>
<td>Non linear trend of DFA with age</td>
<td>1</td>
<td>725</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>19.6%</td>
<td>5</td>
<td>2008</td>
</tr>
<tr>
<td>Female</td>
<td>24.5%</td>
<td></td>
<td>1882</td>
</tr>
<tr>
<td><strong>Setting</strong></td>
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<td></td>
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<tr>
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<td>13.1%</td>
<td>9</td>
<td>7001</td>
</tr>
<tr>
<td>School</td>
<td>16.9%</td>
<td>7</td>
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<td><strong>Type of informant</strong></td>
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<td>Children/adolescent</td>
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<td>6</td>
<td>3597</td>
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<tr>
<td>Parents</td>
<td>12.9%</td>
<td>10</td>
<td>7522</td>
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<td><strong>Cut off</strong></td>
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</tr>
<tr>
<td>≥ 38</td>
<td>13.2</td>
<td>11</td>
<td>10400</td>
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<tr>
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<td>19.9</td>
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<table>
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<tr>
<th>Type of Variable</th>
<th>Prevalence</th>
<th>Studies (n.)</th>
<th>Patients (n.)</th>
</tr>
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<tr>
<td><strong>Geographical areas</strong></td>
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**TABLE 5** Variations of the Prevalence of DFA based on Geographical areas, demographic and other variables in the studies that used CFSS-DS.

**TABLE 6** Variations of the Mean Score of DFA based on Geographical areas, demographic and other variables in the studies that used CFSS-DS.
The present systematic review showed that the prevalence of DFA in paediatric populations was significant in different settings. At least one child out of ten had a level of DFA that hindered his/her ability to tolerate dental treatment. These data are similar to those reported by Klingberg et al. [2007] in a previous systematic review. In the studies employing the CFSS-DS scale, younger children and female children had higher values of DFA. Northern European children and adolescents had a lower prevalence and lower levels of DFA compared to their peers in other geographical areas. Other population variables, such as the type of questionnaire respondent (children or parent/guardian proxies) and the setting (school or dental clinic) were not significantly related to DFA. The choice of threshold level in each study also affected the prevalence of DFA. Epidemiological data concerning DFA can aid the identification of children with high levels of DFA who may require additional support and intervention to reduce their dental anxiety.

Conclusions

The present systematic review showed that the prevalence of DFA in paediatric populations was significant in different settings. At least one child out of ten had a level of DFA that hindered his/her ability to tolerate dental treatment. These data are similar to those reported by Klingberg et al. [2007] in a previous systematic review. In the studies employing the CFSS-DS scale, younger children and female children had higher values of DFA. Northern European children and adolescents had a lower prevalence and lower levels of DFA compared to their peers in other geographical areas. Other population variables, such as the type of questionnaire respondent (children or parent/guardian proxies) and the setting (school or dental clinic) were not significantly related to DFA. The choice of threshold level in each study also affected the prevalence of DFA. Epidemiological data concerning DFA can aid the identification of children with high levels of DFA who may require additional support and intervention to reduce their dental anxiety.
understanding of dental fear, stimulate the identification of factors that contribute to its onset and help create prevention programs to reduce its occurrence.

References