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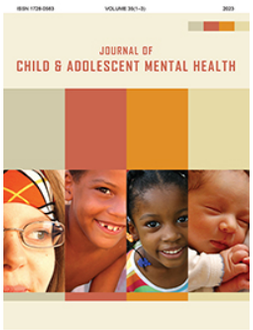

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Why them? A systematic review on common factors among youth who receive compulsory treatment for anorexia nervosa

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Background: **Compulsory interventions, including compulsory nasogastric tube feeding, are sometimes necessary for youth with life-threatening anorexia nervosa. However, these interventions are also potentially traumatic for patients and clinicians alike.**
Objective: **To improve early recognition and prevention of compulsory interventions, we evaluated common factors among youth with anorexia nervosa who receive compulsory treatment.**
Method: **We conducted a systematic literature search of peer-reviewed studies in PubMed, Embase, Medline, PsycINFO, and WOS core collection. Two authors independently screened 7 447 articles and conducted a quality appraisal of the included studies. We thematically synthesised patient, contextual, and treatment factors of youth (≤ 24 years) who received compulsory treatment for anorexia nervosa.**
Results: **We included 16 studies and five themes, with ten subthemes, emerged from the data, most with a medium strength of evidence. Patients exhibited common character traits, various comorbidities, and lives marked by instability or adversity. Furthermore, patients experienced complicated contextual factors, including family dysfunction and social isolation.**
Discussion: **Prolonged and inconsistent treatment histories may increase social isolation and anorexia identification, which in turn may lead to increased treatment resistance and a higher likelihood of compulsory interventions.**
Conclusion: **The diversity of presented factors in this systematic review emphasises the importance of personalised care. Early acknowledgement of factors associated with the illness is crucial for working towards recovery and preventing further deterioration. Furthermore, even when anorexia nervosa diverts all attention to dangerous levels of weight loss, attention to quality of life may help a patient find treatment motivation.**

Keywords: adolescent, anorexia nervosa, coercion, nasogastric intubation, (inpatient) treatment, young adult

Introduction

While compulsory treatment of adolescents and young adults (youth) with anorexia nervosa (AN) is generally regarded to be acceptable in dire situations, these interventions remain controversial and should be avoided whenever possible (Tan et al., 2008, 2010). Compulsory nasogastric tube feeding (CNF) is a particularly intrusive and sometimes counter-intuitive type of compulsory intervention, as it is life saving and simultaneously causes significant psychological and physical

trauma to patients, their families, nurses, and psychiatrists alike (Guarda et al., 2007; Kodua et al., 2020; Stoll et al., 2021; Tan et al., 2003, 2008, 2010). To identify ways to prevent these compulsory interventions, a deeper understanding of common factors among youth with AN who receive compulsory treatment is essential. The aim of this systematic review was to identify patient, contextual, and treatment related factors associated with the necessity of compulsory interventions, including CNF, among youth with AN.

Anorexia nervosa is a potentially severe disorder with the highest mortality rate among psychiatric disorders with 5.1 deaths per 1 000 person-years or a standardised mortality ratio of 5.9 with a mean follow-up of 14.2 years (Arcelus et al., 2011). AN is especially prevalent among adolescent and young adult females, and may result in a wide range of medical comorbidities (Arcelus et al., 2011; Gibson et al., 2020; Keski-Rahkonen & Mustelin, 2016; Micali et al., 2013; Smink et al., 2013). The lifetime prevalence of AN in western countries is < 1 to 4% and increasing, posing a significant burden on healthcare budgets (Ágh et al., 2016; Keski-Rahkonen & Mustelin, 2016; Martínez-González et al., 2020; Smink et al., 2013; Udo & Grilo, 2018; van Eeden et al., 2021). It needs to be considered that the occurrence of AN is not limited to western cultures, and that the reporting of epidemiological data may vary greatly due to stigma associated with mental illness (Martínez-González et al., 2020). Established risk factors for the development of AN include personality traits such as perfectionism, perseverance, low self-esteem, psychiatric comorbidities, cumulative adverse experiences, several familial factors including family discord, parental dieting or encouragement thereof, and environmental factors such as social isolation during the COVID-pandemic (Haripersad et al., 2021; Haynos et al., 2016; Keski-Rahkonen & Mustelin, 2016; Phillipou et al., 2020; Pike et al., 2021; Termorshuizen et al., 2020). For adolescents specifically, the preferred treatment modalities primarily adhere to a family-based approach, such as family based therapy with the addition of targeted individual treatment (Brockmeyer et al., 2018; Lock, 2019; Watson & Bulik, 2013).

The nature of AN is inherently egosyntonic and paradoxical, which often means that patients deny their illness or the severity thereof, and refuse treatment (Gregertsen et al., 2017; Túry et al., 2019). Compulsory treatment is reported for 13 to 44% of patients with AN who are admitted for clinical care, particularly in cases of treatment refusal and life-threatening medical complications or acute psychiatric comorbidities (e.g., suicidality) (Clausen & Jones, 2014; Clausen et al., 2018; Elzakkers et al., 2014). Compulsory treatment may include various medical interventions, including and/or restriction of freedom, such as compulsory admissions. It is important to note that a small subsample of patients with AN who receive compulsory treatment receive an absolute majority of compulsory interventions (Mac Donald et al., 2023). Furthermore, while compulsion for patients with AN is seen around the world, the application and description of compulsion differs between cultures and jurisdictions (Kallert et al., 2007; Molodynski et al., 2014). Despite these differences, it is clear that compulsory interventions, particularly CNF, are potentially traumatic for both patients and practitioners, and may negatively affect therapeutic relationships and the process of recovery (Clausen, 2020; Kodua et al., 2020; Tan et al., 2008, 2010).

The onset of AN most frequently occurs during early adolescence, which is a critical time of social, emotional, and physical development (Keski-Rahkonen & Mustelin, 2016; Molleman et al., 2022). Thus, it is noteworthy that previous review studies did not place specific emphasis on this age group. Published reviews on patients with AN of all ages reported early illness onset, presence of comorbidities, longer illness duration, and multiple previous and prolonged admissions as potential risk factors for compulsory treatment (Atti et al., 2021; Clausen & Jones, 2014; Di Lodovico et al., 2021; Elzakkers et al., 2014; Mac Donald et al., 2023). As suitably described by Clausen and Jones (2014), “involuntary treatment is not a reaction to the severity of eating disorder symptoms alone but is most likely a response to the complexity of the patient’s situation as a whole”. Therefore, it is likely that factors such as waiting lists, therapist turnover, and the quality of a therapeutic alliance potentially play an important role (de Soet et al., 2023).

Goal of the review

Given the above, a comprehensive and up-to-date overview of factors associated with compulsory treatment, specifically for youth with AN, is essential. Since AN typically starts in

adolescence, we aimed to contribute additional insights from a developmental perspective specific to adolescence and young adulthood. This overview can guide clinicians who care for youth with AN in making informed decisions about the utilisation and prevention of compulsion. Hereby, clinicians may potentially prevent or reduce stress and trauma related to compulsory treatment for youth with AN, their families, and the involved clinicians (including but not limited to psychiatrists, psychologists, sociotherapists, and nurses). Therefore, the objective of this systematic review is to evaluate the available literature on patient, contextual, and treatment related factors that are associated with the necessity for compulsory treatment interventions for youth with AN.

Methodology

This systematic literature review follows the PRISMA guidelines and was registered in the International Prospective Register of Systematic Reviews (PROSPERO, ID: CRD42021270525). No Medical Ethics Review Committee (METC) approval was required.

Literature search strategy

We performed an extensive literature search in collaboration with an the Walaeus Library, Leiden University Libraries' medical library. PubMed, Embase, Medline, PsycINFO, and Web of Science Core Collection were searched to achieve optimal coverage (Bramer et al., 2017). The search terms (Appendix A) included synonyms for eating disorders, anorexia nervosa, compulsory treatment, treatment refusal, and the age group from children to young adults. The search terms were adapted to each database. No restrictions on the date of publications were applied since previous reviews without age restriction found only limited available evidence (Atti et al., 2021; Clausen & Jones, 2014; Di Lodovico et al., 2021; Elzakkers et al., 2014). We performed the final search in September 2023.

Processing and eligibility

After systematic deduplication in Endnote (v21) (Bramer et al., 2016), the articles were uploaded to the online systematic review tool Rayyan (Ouzzani et al., 2016). Two authors (TO & BV) independently screened all articles' titles and abstracts, and then found consensus for inclusion based on the following inclusion criteria:

(i) Participants: Subgroup analysis or specific focus on patients of 10 to 24 years of age who received compulsory treatment for AN. There were no restrictions regarding comorbidities, as these often occur in this specific group of patients.
(ii) Setting: Mental healthcare institutions that provided formal compulsory treatment for patients suffering from AN. We defined formal compulsory treatment as treatment against the wishes of a patient within a clearly defined legal framework. If a legal framework for compulsion was not specified, the authors included the article if treatment was initiated even if a patient was clearly described to refuse it (e.g., requiring restraint).
(iii) Outcome: The articles described patient characteristics (e.g., age, gender, weight, comorbidities), contextual factors (e.g., family comorbidities, family structure, and socio-economic status) and/or treatment factors (e.g., waiting lists, treatment type, treatment duration, therapeutic relationship) in relation to compulsory treatment for AN.
(iv) Study type: All peer reviewed studies, except for letters, editorials, conference abstracts, and comments were eligible.
(v) Language: We included articles published in English or Dutch.

Following the initial selection based on title and abstract, the remaining articles were independently screened based on their full texts for the same criteria by two authors (TO & BV). Coauthor (LN) aided in the resolution of 12 conflicting decisions. The PRISMA flowchart (Figure 1) depicts the above process.

Data collection and syntheses

After the study selection, the first author (TO) extracted the data onto pre-defined extraction forms (Appendix B) under supervision of coauthor (LN), who is an experienced qualitative review author. Data points included: title, author(s), publication year, study design, research question, methodology, study setting, sample demographics, interventions, source of evidence, conflict of interests, and quality appraisal. Moreover, we recorded study outcomes regarding the research question into pre-defined categories of patient characteristics, contextual factors, and treatment factors.

After data extraction was completed, a thematic synthesis was performed to identify and report themes within the data (Thomas & Harden, 2008). This approach consisted of three steps, conducted by the first author (TO) under close supervision of a coauthor (LN). After line-by-line coding of the included full text articles (first step), aided by the extraction forms, we developed descriptive themes by grouping of similar codes (second step). Third, the first author (TO) sought overarching themes and subthemes beyond the descriptive themes (Snilstveit et al., 2012), which were discussed amongst the review team several times to reach consensus.

Quality assessment and strength of evidence

The quality of each included study was assessed using the critical appraisal checklists of the Johanna Briggs Institute (JIB: Aromataris & Munn, 2020). We used different forms based on the study type, including case report, case series, case control, and qualitative. For each of the scoring criteria “yes” = two points; “can’t tell” or “unclear” = one point; and “no” = zero points. We calculated a score of 0.0 to 1.0 points by dividing the total scored points by the highest possible score, excluding any inapplicable topics. Scores of 0.7 to 1.0 were rated high quality; scores 0.5 to 0.7 were rated medium quality; and scores below 0.5 were rated low quality.

After data extraction, assessment of the quality of each individual study with the JBI quality assessment forms, and thematic synthesis, the strength of evidence for each of the constructed subthemes was assessed based on the GRADE approach (Guyatt et al., 2008a, b). This approach illustrates the strength of evidence of a theme relative to the other themes found. We used a pre-defined ranking system to assess the strength of evidence objectively and consistently for each of the subthemes based on four categories (quality of study, size of evidence, hierarchical value, and consistency of evidence). Thereafter, the strength of evidence was assessed based on the total of all scored subscales: strong (++++/+++/++), medium (+/±/-), or weak (- -/- - -/- - - -).

We rated the quality of included studies within a subtheme based on the JBI critical appraisal scores of the included studies. This was graded as high (+) if 75% or more of included studies in a subtheme were rated as high quality; medium (±) if between 25 to 75% of included studies in a subtheme were rated as high quality; or low (-) if 25% or less of studies in a subtheme were rated as high quality.

The size of evidence was based on the number of studies included in each subtheme. Based on available evidence, the size of evidence was determined as large (+) if ten or more studies were included; medium (±) if five to nine studies were included; and low (-) when less than five studies were included.

We based the hierarchical value of the study types in a subtheme on the highest rated included study. This rating of studies was based on the valuation of study types by the Agency for Health Care Policy and Research (Harbour & Miller, 2001). Studies were rated as high (+) if it was an RCT; medium (±) if it was a non-randomised intervention study (e.g., case control/cohort); or low (-) if the evidence was based on non-experimental studies (e.g., case reports/case series/qualitative).

The consistency of evidence was assessed as consistent (+) when all studies within a subtheme led to similar data or conclusion; mixed (±) when data or conclusions were similar but included outliers; and inconsistent (-) when data or conclusions from included studies were largely contradictory.

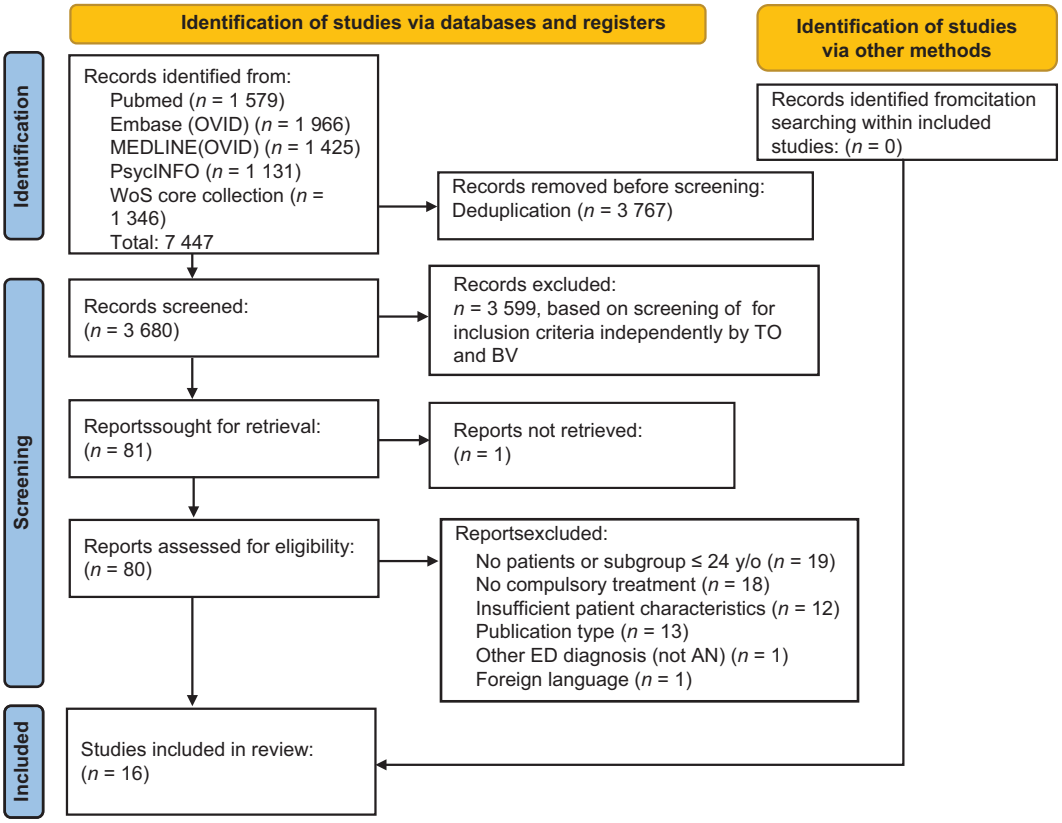

Figure 1. PRISMA flowchart article selection

Results

Study selection

The database search identified 7 447 records. From this, we exported 3 680 non-duplicate publications to a reference manager (Endnote v21). Title-abstract screening in Rayyan resulted in the inclusion of 81 articles, of which 80 full-texts were retrieved for full-text screening. This led to the final inclusion of 16 studies. No additional publications were identified through screening the reference lists of the included studies or relevant reviews.

Study characteristics and quality assessment

The study characteristics are summarised in Table 1. Included studies were published between 1996 and 2022 and were all conducted in healthcare institutions (mental and/or physical), such as specialist eating disorder treatment centres or university clinics. As detailed in Table 1, the included studies all described the use of a variety of compulsory interventions, including CNF, restraint, medication, and sedation. Most studies ranked low in the scientific hierarchy of study types. Specifically, seven were case reports (including jurisprudence), seven were case series (including reflective studies), one was a case control study, and one was a qualitative study. Most reports originated from Europe, the USA, and Japan. The individual study quality for the purpose of this review was rated high (*n* = 10: Ayton et al., 2004, 2009; Blikshavn et al., 2020; Brodrick et al., 2020; de Cruz 1999; Holm et al., 2012; Joshi et al., 2022; Mishra, 2012; Robinovitz et al., 2021;

Seed et al., 2016), medium (*n* = 5: Honig et al., 1996; Kondo et al., 2004; Neiderman et al., 2000; Parker 1998; Serfaty et al., 1998), and low (*n* = 1: Túry et al., 2019).

Outcomes

We sought to identify factors associated with compulsory treatment for youth with AN within the pre-defined categories of patient, contextual and treatment related factors. Table 2 summarised the complete strength of the evidence appraisal. The thematic synthesis within the data of the three predefined categories led to five themes and ten subthemes. The strength of evidence was rated "medium" in all but one of the subthemes (Therapeutic relationship), which was rated "low" as this was described with mixed consistency in only two studies of low hierarchical value. The data consistency was often mixed, which is illustrative of the wide variation among patients with AN.

Category 1: Patient characteristics

This category consists of two themes and five subthemes describing factors related to individuals who received compulsory treatment for AN during their youth. The themes within this category describe traits of individuals and causes of change.

Theme 1: Traits of individuals

Theme 1A: (A)typical character

The youth were described by a heterogeneous set of "(A)typical character" traits. Detailed character descriptions in six studies included: intelligent (*n* = 4), perfectionist (*n* = 3), hardworking (*n* = 2), friendly (*n* = 1), sporty (*n* = 1), manipulative (*n* = 2), having an uncertain sense of self (*n* = 1), having a tendency for self-blame (*n* = 1), and negative upward comparison to peers (*n* = 1) (Brodrick et al., 2020; Holm et al., 2012; Joshi & Marvin, 2022; Mishra, 2012; Robinovitz et al., 2021; Seed et al., 2016). One study reported about a patient with particularly aggressive tendencies towards animals and people, including family members (Robinovitz et al., 2021). Some patients were described to have a lack of friends, hobbies, and perspective, while others had friends and were studying, working, or pursuing a PhD (Brodrick et al., 2020; Holm et al., 2012; Mishra, 2012; Neiderman et al., 2000). Other descriptions included selective eating behaviours during childhood and a capacity for radical dietary changes, such as completely abstaining from food intake or hydration (Ayton et al., 2004; Brodrick et al., 2020; de Cruz, 1999; Joshi & Marvin, 2022; Neiderman et al., 2000; Robinovitz et al., 2021).

Theme 1B: A variety of mental health issues

Although it was often difficult to discern the causal relationship between mental health and treatment of AN within the publications, it was clear that patients with AN who received compulsory treatment suffered from a variety of mental health issues including attention deficit hyperactivity disorder, autism spectrum disorder, obsessive compulsive disorder, personality disorders, medically unexplained physical symptoms, psychotic episodes, conduct disorder, depression, self-harm, suicidal thoughts and suicide attempts, sexual abuse, experiences of bullying, anxiety, shame, low self-worth, substance abuse, and grief in relation to the death of parents and/or pets (Ayton et al., 2004; Brodrick et al., 2020; de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Joshi & Marvin, 2022; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Seed et al., 2016). More specifically, a study comparing patients in a compulsory treatment setting with patients in an informal care setting concluded that depression and self-harming behaviour were more common among patients who received compulsory treatment (Ayton et al., 2009).

Theme 2: Causes of change

Theme 2A: When and why anorexia nervosa begins

The average age at onset of AN among youth who received compulsory treatment (when anorexia nervosa begins) was reported at 12.87 years (range 8 to 21 years) in 16 single cases (Ayton et al., 2004; Brodrick et al., 2020; de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Joshi & Marvin,

2022; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Serfaty et al., 1998). This was similar to 12.5 years (SD = 1.9 years) in a series of 16 cases, and was reported to be significantly younger than patients in a voluntary care setting (Ayton et al., 2009). A variety of triggers to AN onset (Why anorexia nervosa begins) included stacked psychosocial stressors such as social isolation, bullying, break-ups, parental divorce, struggling with day-to-day life, and significant losses (Ayton et al., 2004; Brodrick et al., 2020; Holm et al., 2012; Mishra, 2012; Neiderman et al., 2000; Seed et al., 2016). Other reports included AN onset after dieting, during a growth spurt, or a seemingly parallel development of AN and psychosis (Brodrick et al., 2020; Holm et al., 2012; Neiderman et al., 2000; Robinovitz et al., 2021). We describe social and familial stressors that were related to AN onset in Category 2 (contextual factors).

Theme 2B: Correlates of deterioration

Several characteristics could be described as correlates of deterioration. Many of the patients who were described in the included studies did not acknowledge the severity of their illness, often refused treatment, and exhibited behaviours that interfered with their caregivers' ability to provide support (de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Josh & Marvin, 2022; Mishra, 2012; Parker, 1998; Robinovitz et al., 2021; Túry et al., 2019). However, four studies described that even when patients acknowledged their illness, they remained reluctant to participate in treatment (Holm et al., 2012; Mishra, 2012; Seed et al., 2016; Serfaty et al., 1998). Furthermore, two case reports specified how the treating and independent consulting psychiatrists concluded that the patients were incapable of adequate decision-making with regard to treatment of AN and nutritional intake (Ayton et al., 2004; de Cruz, 1999). In four studies, clinicians and patients reported that patients would experience hopelessness about their future perspectives, dropped out from school, and increasingly isolated themselves (Brodrick et al., 2020; Honig et al., 1996; Mishra, 2012; Seed et al., 2016). Moreover, prolonged and repeated admissions throughout adolescence were described as especially detrimental (Mishra, 2012; Serfaty et al., 1998). In a qualitative study, all patients (n = 12) retrospectively reported becoming consumed by their anorectic identities (Seed et al., 2016). Moreover, across six studies, both clinicians and patients reported that patients would often compete for acknowledgement from peers and clinicians by exhibiting increasingly severe eating disorders through rebellious, disturbed, and self-destructive behaviours, even as they expressed a fear of dying (Brodrick et al., 2020; de Cruz, 1999; Holm et al., 2012; Neiderman et al., 2000; Seed et al., 2016; Túry et al., 2019).

Theme 2C: Start of compulsion

On average, among 12 individual cases, patients had AN for approximately 3.3 years before the start of compulsion (range: six months to 13 years), or 3.8 years (SD = 2.1 years) among a cohort of 16 cases (Ayton et al., 2004, 2009; Brodrick et al., 2020; de Cruz, 1999; Honig et al., 1996; Joshi & Marvin, 2022; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Serfaty et al., 1998). However, acute illness development and quick illness deterioration towards a setting of compulsory interventions were also reported (Brodrick et al., 2020). The weight at the start of compulsion was an inconsistent factor, as some patients were extremely underweight (e.g., body mass index (BMI) 9.0 kg/m2) while others had BMIs higher than 16 kg/m^2 (Ayton et al., 2004; Brodrick et al., 2020; Holm et al., 2012; Honig et al., 1996; Josh & Marvin, 2022; Mishra, 2012; Neiderman et al., 2000; Robinovitz et al., 2021; Serfaty et al., 1998; Túry et al., 2019). Other reports noted that patients who received compulsory treatment had similar or higher height-to-weight ratios as patients who received treatment under parental consent, which was explained by re-feeding in medical setting prior to the reported compulsion in mental healthcare (Ayton et al., 2009; Blikshavn et al., 2020; Kondo et al., 2004). Concerns about the medical status were often the reason for compulsory interventions (Kondo et al., 2004). Patients that underwent compulsion were described as extremely emaciated, at risk of collapse, and unable to walk or care for themselves (Brodrick et al., 2020; de Cruz, 1999; Neiderman et al., 2000; Túry et al., 2019). Furthermore, other medical complications which were reported included amenorrhea, orthostasis, bradycardia, hypothermia, chest pains, hypoglycaemia, low prealbumin levels, hypophosphatemia, electrolyte or hormonal

imbalance, leukopenia, neutropenia, growth impairment, constipation, dysuria, dizziness, lanugo hairs, and feeling cold (Ayton et al., 2004; Brodrick et al., 2020; Honig et al., 1996; Josh & Marvin, 2022; Neiderman et al., 2000; Robinovitz et al., 2021; Túry et al., 2019).

Category 2: Contextual factors

This category consists of two themes that describe family related factors such as comorbidities and family dysfunction, and broader social struggles such as life events and development within a clinic environment.

Theme 3: Family mental health and dynamics

We found a complex interplay between family mental health problems and complicated dynamics within families. Depression was the most frequently reported psychiatric disorder among family members of the reported patients (Ayton et al., 2004; Neiderman et al., 2000; Parker, 1998). A wide range of other reported family mental health issues included special educational needs among siblings, alcoholism, panic attacks, suicide attempts, AN or other weight-related problems, specific phobias, and intrafamilial sexual abuse (Ayton et al., 2004; de Cruz, 1999; Holm et al., 2012; Neiderman et al., 2000; Parker, 1998).

While two studies reported caring, actively involved, and successful families (Kondo et al., 2004; Mishra, 2012), five studies reported various complicated family dynamics. Specifically, parental conflicts and divorce were noted repeatedly (de Cruz, 1999; Kondo et al., 2004; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021). Another study reported financial troubles (Kondo et al., 2004). Families were described as highly dysfunctional (de Cruz, 1999) or neglectful (Kondo et al., 2004), and several of the patients were removed from their home by social services or lived in orphanages (de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Parker, 1998). Even with parents present, it could take many months or more than a year before a child's AN was acknowledged and a first clinical assessment was sought (Ayton et al., 2004; Brodrick et al., 2020). In one case report, a 13-year-old girl who suffered from AN attempted to murder her family members on several occasions, blaming them for her eating disorder (Robinovitz et al., 2021). However, patients also self-reported to remain loyal to their parents regardless of family dysfunction and were afraid they had disappointed their families by receiving compulsory treatment (Seed et al., 2016). Moreover, several studies specifically mentioned active involvement of dysfunctional families in decisions about compulsion (Ayton et al., 2004; Honig et al., 1996; Mishra, 2012; Túry et al., 2019) and several patients were discharged against medical advice following parental decisions (Ayton et al., 2004; Honig et al., 1996; Kondo et al., 2004). For example, one study noted that in case of intrafamilial conflicts, the duration of admissions (7 of 8 cases) was 2-10 times higher than without intrafamilial conflicts (1 of 8 cases) (Kondo et al., 2004).

Theme 4: Social struggles and life events

Studies reported a variety of social struggles and life events. Specifically, two studies reported social isolation as an AN related stressor (Brodrick et al., 2020; Holm et al., 2012). Moreover, various other social difficulties related to AN were reported in a review of five fatal cases including a failed engagement, being bullied, housing issues, or moving far away from an established social network after graduation (Holm et al., 2012). Three case reports described individuals who lived most of their childhood and/or adolescence inside clinics, isolating them from society (Mishra, 2012; Neiderman et al., 2000; Serfaty et al., 1998). Regarding childhood and adolescent development in clinical care, several former patients self-reported that their anorectic identification was strengthened when they were admitted to clinics during adolescence, as they experienced the clinic as a safe "bubble" where other patients were "like a family" (Seed et al., 2016). Notably, losing connection with friends and school, along with growing accustomed to life in the clinical "bubble" heightened the trepidation of returning to normal life, in which the

AN originally developed. Feeling left behind by peers and the growing fear of the outside world further strengthened the anorectic identification and reduced the motivation to recover (Seed et al., 2016).

Category 3: Treatment factors

This category consists of issues in treatment, and includes three subthemes. These themes describe the impact of treatment history, discontinuity of care, and the therapeutic relationship in relation to compulsory treatment for AN.

Theme 5: Issues in treatment

Them 5A: Treatment prior to compulsion

Most patients received a wide variety of treatment prior to compulsion, as detailed in ten of the included studies. These studies described patients who received inpatient treatment in psychiatric facilities (*n* = 8), (partial) in- or outpatient family based therapy (*n* = 5), (intensive) outpatient care (*n* = 4), individual therapy (*n* = 3), occupational therapy (*n* = 1), and psycho education (*n* = 1) (Ayton et al., 2004, 2009; Blikshavn et al., 2020; de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021). Eleven studies specified medical interventions received before compulsion including one or more medical admissions to refeeding programs (*n* = 9), physiotherapy (*n* = 3), psychotropic medication (*n* = 2), primary care follow-up (*n* = 2), and dietary advice (*n* = 1) (Ayton et al., 2004, 2009; de Cruz, 1999; Holm et al., 2012; Joshi & Marvin, 2022). Moreover, ten studies described that patients received care in multiple treatment centres, sometimes spread through different states or countries, including many brief and prolonged medical or psychiatric admissions (Blikshavn et al., 2020; Brodrick et al., 2020; de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Serfaty et al., 1998). Lastly, in three studies, four cases were specified to have actively resisted or withdrawn from treatment, or to have been discharged against medical advice prior to the reported compulsory treatment (Holm et al., 2012; Honig et al., 1996; Parker, 1998).

Theme 5B: (Dis)continuity of care

As noted above, ten studies reported that patients often received a multitude of clinical admissions which could continuously or in intervals encompass most of their childhood or adolescence (Blikshavn et al., 2020; Brodrick et al., 2020; de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Serfaty et al., 1998). Two case reports and a review of five mortal cases reported that patients were discharged due to a lack of motivation, regression and manipulative or attention-seeking behaviour, or by parents against medical advice. This was followed by relapse and illness deterioration, necessitating repeated admissions and compulsion (Ayton et al., 2004; Brodrick et al., 2020; Holm et al., 2012). In two case reports, aggressive behaviour of the patients also led directly to referrals to other more specialised clinics or, eventually, the juvenile justice system (Joshi & Marvin, 2022; Robinovitz et al., 2021). Furthermore, this discontinuity of care reduced patients' trust in the healthcare system, as they felt as if they were being "passed around like bags of luggage" (Seed et al., 2016).

Theme 5C: The therapeutic relationship

Two studies described the therapeutic relationship between clinicians and youth with AN who received compulsory treatment as strained (Seed et al., 2016; Serfaty et al., 1998). However, evidence was mixed, as a variety of experiences were reported ranging from experiencing empathetic nonjudgmental treatment, to patients actively seeking illness deterioration to retaliate against restrictions from clinicians whom they felt had reduced them to "just a person with AN."

Table 1. Study information, quality, and relevant case numbers

Author, Year	Study Type	Country	JBI Quality assessment	Types of compulsion specified	No. of relevant cases
(Kondo et al., 2004)	Case Control	Japan	Medium	Admission (further treatment not specified)	Formal compulsion *n* = 4 Formal compulsion age > 24y *n* = 4 Control *n* = 70
(Honig et al., 1996)	Case Series	England	Medium	Admission, restraint, CNF	*n* = 3
(Serfaty et al., 1998)	Case Series	England	Medium	"Compulsory treatment and/or CNF"	Formal compulsion *n* = 1
(Neiderman et al., 2000)	Case Series	England	Medium	Admission, rehydration, parenteral feeding, gastrostomy, jejunostomy, restraint, sedation, medication, CNF	Formal compulsion *n* = 4
(Ayton et al., 2009)	Case Series	England	High	Admission, medication CNF	Formal compulsion *n* = 16 Control *n* = 32
(Holm et al., 2012)	Case Series	Denmark	High	Admission (further treatment not specified)	Formal compulsion *n* = 3 Control *n* = 0
(Túry et al., 2019)	Case Series	Hungary	Low	Admission (further treatment not specified)	*n* = 1
(Blikshavn et al., 2020)	Case Series	Norway	High	Admission, physical restraint, CNF	Formal compulsion *n* = 12 Parental consent *n* = 16 Control *n* = 10
(Parker, 1998)	Case Report	England	Medium	Admission,	Formal compulsion *n* = 1
(de Cruz, 1999)	Case Report	England	High	Admission, "use of reasonable force"	Formal compulsion *n* = 1
(Ayton et al., 2004)	Case Report	England	High	Admission, bedrest, intensive nursing, oral refeeding,	Formal compulsion *n* = 1
(Mishra, 2012)	Case Report	Germany	High	Admission, forced feeding	Formal compulsion *n* = 1
(Brodrick et al., 2020)	Case Report	USA	High	Admission, medication, CNF	Formal compulsion *n* = 1
(Robinovitz et al., 2021)	Case Report	USA	High	Juvenile justice centre arrest, Admission, mechanical restraint, medication, CNF	Formal compulsion *n* = 1
(Joshi & Marvin, 2022)	Case Report	USA	High	Admission, Sedation, mechanical restraint, CNF	Formal compulsion *n* = 1
(Seed et al., 2016)	Qualitative	England	High	Admission, CNF, restraint, medication	Formal compulsion age ≤ 24y *n* = 4 Formal comp. age ≤ 24y unsure *n* = 5

Table 2. Strength of evidence appraisal

Category	Theme	Subtheme	Included studies (*n* = X)	JBI Quality assessment	Included study types*	Consistency of evidence	Strength of evidence
Patient Characteristics	Traits of individuals	(A)typical character	(Ayton et al., 2004; Brodrick et al., 2020; de Cruz, 1999; Holm et al., 2012; Joshi & Marvin, 2022; Mishra, 2012; Neiderman et al., 2000; Robinovitz et al., 2021; Seed et al., 2016) (*n* = 9) Score: ±	High: 8 (89%) Med: 1 Score: +	CS: 2 CR: 6 QS: 1 Score: -	Mixed Score: ±	Medium (Total: ±)
		A variety of (mental) health issues	(Ayton et al., 2004, 2009; Brodrick et al., 2020; de Cruz 1999; Holm et al., 2012; Honig et al., 1996; Joshi & Marvin, 2022; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Seed et al., 2016) (*n* = 12) Score: +	High: 9 (75%) Med: 3 Score: +	CS: 4 CR: 7 QS: 1 Score: -	Mixed Score: ±	Medium (Total: +)
	Causes of change	When and why AN begins: (Age of onset & Triggers of AN onset)	(Ayton et al., 2004, 2009; Brodrick et al., 2020; de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Joshi & Marvin, 2022; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Serfaty et al., 1998) (*n* = 12) Score: +	High: 7 (58%) Med: 5 Score: ±	CS: 5 CR: 7 Score: -	Consistent Score: +	Medium (Total: +)
			(Ayton et al., 2004; Brodrick et al., 2020; Holm et al., 2012; Honig et al., 1996; Mishra, 2012; Neiderman et al., 2000; Robinovitz et al., 2021; Seed et al., 2016) (*n* = 8) Score: ±	High: 6 (75%) Med: 2 Score: +	CS: 3 CR: 5 QS: 1 Score: -	Consistent Score: +	Medium (Total +)
	Correlates of deterioration	Correlates of AN deterioration	(Ayton et al., 2004; Brodrick et al., 2020; de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Joshi & Marvin, 2022; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Seed et al., 2016; Serfaty et al., 1998; Túry et al., 2019) (*n* = 13) Score: +	High: 8 (62%) Med: 4 Low: 1 Score: ±	CS: 6 CR: 6 QS: 1 Score: -	Consistent Score: +	Medium (Total: +)

Category	Theme	Subtheme	Included studies (*n* = X)	JBI Quality assessment	Included study types*	Consistency of evidence	Strength of evidence
	Start of Compulsion	Start of compulsion: (Duration until compulsion & Weight at compulsion & Medical status pre-compulsion)	(Ayton et al., 2004, 2009; Brodrick et al., 2020; de Cruz, 1999; Honig et al., 1996; Joshi & Marvin, 2022; Neiderman et al., 2000; Parker 1998; Robinovitz et al., 2021; Serfaty et al., 1998) (*n* = 10) Score: +	High: 6 (60%) Med: 4 Score: ±	CS: 4 CR: 6 Score: -	Consistent Score: +	Medium (Total: +)
			(Ayton et al., 2004, 2009; Blikshavn et al., 2020; Brodrick et al., 2020; Holm et al., 2012; Honig et al., 1996; Joshi & Marvin, 2022; Kondo et al., 2004; Mishra, 2012; Neiderman et al., 2000; Robinovitz et al., 2021; Serfaty et al., 1998; Túry et al., 2019) (*n* = 13) Score: +	High: 8 (62%) Med: 4 Low: 1 Score: ±	CC: 1 CS: 7 CR: 5 Score: ±	Inconsistent Score: -	Medium (Total: ±)
			(Ayton et al., 2004; Brodrick et al., 2020; de Cruz, 1999; Honig et al., 1996; Joshi & Marvin, 2022; Kondo et al., 2004; Neiderman et al., 2000; Robinovitz et al., 2021; Túry et al., 2019) (*n* = 9) Score: ±	High: 5 (56%) Med: 3 Low: 1 Score: ±	CC: 1 CS: 3 CR: 5 Score: ±	Consistent Score: +	Medium (Total: +)
Contextual factors	Family mental health and dynamics	Family mental health and dynamics: (Comorbid families & Family dynamics)	(Ayton et al., 2004; Holm et al., 2012; Kondo et al., 2004; Neiderman et al., 2000; Parker, 1998) (*n* = 5) Score: ±	High: 2 (40%) Med: 3 Score: ±	CC: 1 CS: 2 CR: 2 Score: ±	Mixed Score: ±	Medium (Total: ±)
			(Ayton et al., 2004; Brodrick et al., 2020; de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Kondo et al., 2004; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Seed et al., 2016; Túry et al., 2019) (*n* = 12) Score: +	High: 7 (58%) Med: 4 Low: 1 Score: ±	CC: 1 CS: 4 CR: 7 QS: 1 Score: ±	Mixed Score: ±	Medium (Total: +)
	Social struggles and life events	Social struggles and life events	(Brodrick et al., 2020; Holm et al., 2012; Mishra, 2012; Neiderman et al., 2000; Seed et al., 2016; Serfaty et al., 1998) (*n* = 6) Score: ±	High: 4 (67%) Med: 2 Score: ±	CS: 3 CR: 2 QS: 1 Score: -	Mixed Score: ±	Medium (Total: -)

Category	Theme	Subtheme	Included studies (*n* = X)	JBI Quality assessment	Included study types*	Consistency of evidence	Strength of evidence
Treatment factors	Issues in treatment	Treatment prior to compulsion	(Ayton et al., 2004, 2009; Blikshavn et al., 2020; Brodrick et al., 2020; de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Joshi & Marvin, 2022; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Serfaty et al., 1998) (*n* = 13) Score: +	High: 9 (69%) Med: 4 Score: ±	CS: 6 CR: 7 Score: -	Mixed Score: ±	Medium (Total: ±)
		(Dis)continuity of care	(Ayton et al., 2004; Brodrick et al., 2020; Holm et al., 2012; Honig et al., 1996; Joshi & Marvin, 2022; Mishra, 2012; Neiderman et al., 2000; Parker, 1998; Robinovitz et al., 2021; Seed et al., 2016; Serfaty et al., 1998) (*n* = 11) Score: +	High: 7 (63%) Med: 4 Score: ±	CS: 4 CR: 6 QS: 1 Score: -	Consistent Score: +	Medium (Total: +)
		The therapeutic relationship	(Seed et al., 2016; Serfaty et al., 1998) (*n* = 2) Score: -	High: 1 (50%) Med: 1 Score: ±	CS: 1 QS: 1 Score: -	Mixed Score: ±	Low (Total: - -)

Note. *CC = Case Control, CS = Case Series, CR = Case Report, QS = Qualitative Study

Discussion

Our results illustrated that youth with AN who received compulsory treatment often had lives marked by instability or adversity that eventually led to situations in which compulsory treatment was required. These patients frequently exhibited personal vulnerabilities and were likely to accumulate various negative experiences at a relatively early age, which may have led to the onset of AN. Additional negative experiences were likely to occur during the treatment of AN, strengthening their anorexic identification. For example, receiving compulsory treatment may have a detrimental impact on a persons' self-evaluation and confidence (Seed et al., 2016). This is consistent with existing literature that patients with AN frequently report family dysfunctionality, social difficulties, and often exhibit a variety of mental health issues (Haripersad et al., 2021; Haynos et al., 2016; Keski-Rahkonen & Mustelin, 2016; Phillipou et al., 2020; Pike et al., 2021; Termorshuizen et al., 2020). Given the immense strain that severe AN and compulsory treatment such as CNF places on patients, their families, and their social networks, it is important to acknowledge the potential for bidirectional causality. As such, the stress caused by the severity of AN and compulsory treatment such as CNF may contribute to family and social difficulties (Tan et al., 2010). Additionally, existing family dysfunctionality and social challenges may exacerbate the severity of AN and the potential need for compulsory treatment (Haynos et al., 2016). In line with the suggestions from a recent publication, this select group of patients was characterised by poor quality of life, lack of first-line treatment response, medical severity and instability, and severe eating disorder symptomatology (Tsiandoulas et al., 2023). Youth with severe and enduring mental healthcare problems, in this case severe anorexia nervosa, require specific attention in treatment, as they often drop out and lack personalised support, ultimately leading to further illness deterioration and treatment failure (de Soet et al., 2023).

Based on this review, we formulated three implications that warrant attention in improving AN care. First, clinicians should aim to acknowledge and treat the factors associated with the youth's development of AN, even when the weight loss may be the most pressing and visible medical issue. Although the study samples exhibited several common factors, this review described a wide variability between individuals. Body weight alone, as reported in the included studies, seemed to be of limited impact regarding the utilisation of compulsory treatment (Ayton et al., 2004; Brodrick et al., 2020; Holm et al., 2012; Honig et al., 1996; Joshi & Marvin, 2022; Mishra, 2012; Neiderman et al., 2000; Robinovitz et al., 2021; Serfaty et al., 1998; Túry et al., 2019). Moreover, the strong heterogeneity of character traits reported were mostly in line with previously reported 'typical' characteristics of youth with AN (Dufresne et al., 2020), and cannot be used to distinguish those who receive compulsory treatment from those who do not. Clinical history characteristics that may be linked to compulsion included a longer duration of illness and repeated admissions before compulsion. However, these traits project a circular chain of reasoning, which is of little use to prevent illness deterioration in clinical practice (Holm et al., 2012). Hence, clinicians should consider the position of other social or mental health issues in relation to the onset or course of AN, which may also need to be addressed at times of severe weight loss. Based on this limited evidence, we suggest that AN should be seen as a coping mechanism which tends to divert attention away from various underlying problems. As such, the factors that may be associated with AN development and deterioration must be identified and acknowledged during treatment. Our findings suggested that factors related to the onset of AN may be different to factors that maintain the AN, such as biological factors and the impact of severe AN on the family system. Therefore, clinicians are encouraged to evaluate each patient on an individual level, and to be wary of generalising patients with AN. Herein, clinicians must navigate the challenging balance between the management of medical complications while also recognising the individual and addressing the causes of AN during treatment.

Second, concerning contextual factors, our findings indicated a relationship between AN and social challenges across multiple domains, especially in severe cases that required compulsory treatment. Many of the included studies reported family members with their own mental health issues,

dysfunctional family dynamics, and intrafamilial conflicts (Ayton et al., 2004; de Cruz, 1999; Holm et al., 2012; Honig et al., 1996; Kondo et al., 2004; Mishra 2012; Neiderman et al., 2000; Parker, 1998; Seed et al., 2016). Furthermore, several studies specifically described situations in which dysfunctional caretakers shared responsibility for compulsory treatment decisions (Ayton et al., 2004; Honig et al., 1996; Mishra, 2012; Túry et al., 2019). These studies did not elaborate further on this, but one may deduce that this could increase a patient's distrust and treatment reluctance. A patient's refusal of treatment might also be related to the coercion paradox, in which a patient's AN forces family members and clinicians to provide them with boundaries and structure, potentially through formal compulsion (Túry et al., 2019). Furthermore, social isolation through increasing restrictions and compulsion may further strengthen the anorexic identity, as this acknowledges the patient's suffering and may strengthen their bonding with peers in similar situations (Seed et al., 2016; Tan et al., 2010). This anorexic identification is further reinforced as compulsory treatment often removes patients from "the real world" and normal social perspectives, forcing patients to develop in a highly unnatural setting during their adolescence (Keski-Rahkonen & Mustelin, 2016; Molleman et al., 2022). This further emphasises the importance of a family-oriented approach to treating AN (Lock, 2019). Therefore, clinicians should be mindful of the social impact of compulsory treatment decisions, since compulsory interventions may make it more difficult for patients to connect with their social environment, thereby making it more difficult for them to find a hopeful future perspective and motivation for recovery. We encourage clinicians to be creative in facilitating the patient's connection to the world outside of clinics, for example, by inviting family and friends for visits or by participating in school assignments. Future research should evaluate the parental role in compulsory treatment decisions in relation to family functioning and the developmental impact of compulsory inpatient AN treatment.

Lastly, the therapeutic alliance was crucial in itself and the education of clinicians who care for youth with AN is equality important since it directly contributes to building and sustaining that alliance. Several reports noted that patients experienced their treatment as punitive and that clinicians involved in their treatment often attributed their behaviour and personality solely to their AN (Seed et al., 2016; Serfaty et al., 1998). Considering the egosyntonic nature of AN, combined with repeated and apparently failing treatment (Clausen & Jones, 2014; Elzakkers et al., 2014), these patients may come to increasingly identify with their anorexic self. This may further deteriorate the therapeutical alliance and patients' treatment motivation, as patients may perceive the care and acknowledgement they receive were based only on the severity of their illness (Gregertsen et al., 2017; Seed et al., 2016; Serfaty et al., 1998). Patients may even seek illness deterioration in search of acknowledgement, since they experience that they only receive care when their illness is especially severe (Clausen, 2020). With this in mind, therapists should be mindful of the paradoxical nature of AN, in which patients both need and despise their illness, and often get stuck in vicious circles of illness deterioration (Túry et al., 2019). Thus, it is critical that clinicians who may encounter youth with AN, from primary through tertiary or academic care settings, are educated about the wide-ranging causes of AN and the necessity of empathetic and nonjudgmental treatment. Furthermore, the distressing and traumatic impact on clinicians as a result of providing compulsory treatment for youth with AN must be considered (Kodua et al., 2020), especially since clinicians may become desensitised (Matthews & Williamson, 2016; Seed et al., 2016). Clinicians should seek to build a safe working environment and, as a team, cultivate an ethical framework within which they may provide compulsory treatment, with particular attention to CNF, which may be the most impactful interventions. We hypothesise that future ethical research may find that such ethical frameworks could establish boundaries to the extent of compulsory interventions; thereby protecting the morality of clinicians and protecting them from desensitisation. Moreover, future research should address the impact of compulsory treatment for youth with AN, considering patients, their families, and clinicians individually, and regarding the therapeutic relationship between them.

Notably, due to the number of included studies, mostly case series and case reports, the implications of this study must be interpreted as indicative. This highlights the importance of further research in this subject.

Clinical implications

A combination of various individual, family/social, and treatment factors affect the development and course of anorexia nervosa. Repeated admissions, longer duration of illness, treatment failure, and continuous focus on the eating disorder may incite a sense of hopelessness, strengthen anorectic identification, and increase treatment resistance and the likelihood of compulsory interventions. It is essential to acknowledge the causes of anorexia nervosa to motivate patients for recovery. However, various potential medical complications of anorexia nervosa may receive priority. There is limited data available and future research into the development and course of anorexia nervosa, anorexic identity, therapeutic relationships, potential preventative measures, and the role of family members is essential.

Strengths, limitations, and future recommendations

This is the first systematic review about compulsory treatment for AN that specifically focused on adolescents and young adults (youth). While findings from the present study are consistent with previous systematic reviews focusing on adult populations without an age restriction, this review's methodology provides a more detailed narrative on potential progression and causes of deterioration in a developing population (Atti et al., 2021; Clausen & Jones, 2014; Elzakkers et al., 2014). These insights may prove to be illustrative for clinicians to reflect upon in their clinical practice. The study was pre-registered, and we followed PRISMA guidelines during study selection and reporting, leading to transparency and repeatability. Moreover, study selection was based on pre-defined criteria and conducted two-fold by two authors independently and were discussed with a third to minimise bias.

Similar to previous reviews on compulsory treatment for AN, any conclusion from this study should be approached tentatively given that the number of available of studies is limited and the variability is wide (Atti et al., 2021; Clausen & Jones, 2014; Elzakkers et al., 2014). In future systematic review studies, when more evidence becomes available, it would be advisable to limit the search band for publication year, as ethical and patient-centred treatment will have improved and continues to improve, over time. In this study, however, the current volume of available evidence was too small to consider restricting the inclusion criteria for publication year after the search. The strength of evidence of all themes was rated "medium" except for the topic of therapeutic relationship, which was rated "low." This was mostly explained by the limited number of included studies, study types with low scientific hierarchical value, and some subthemes with mixed or inconsistent evidence. However, the mixed consistency of data may reflect the wide variability that is inherent to the potential causes and courses of AN, as well as the limited availability of high quality research (Haynos et al., 2016; Keski-Rahkonen & Mustelin, 2016). Nonetheless, some of the most detailed and valuable elaborations were found in the qualitative study of Seed and colleagues (2016) and the detailed descriptions in the case reports or legislation-oriented studies. High quality qualitative and observational research could be a befitting method to provide valuable insights of the interplay of a myriad factors with high ecological validity (Bezance & Holliday, 2013; Colton & Pistrang, 2004; Offord et al., 2006; Tan et al., 2010).

During study selection, it was occasionally challenging to discern whether or not the reported patients received formal compulsory treatment, which may be explained by legislative and cultural variation between countries (Kallert et al., 2007; Kondo et al., 2004). Furthermore, the included studies were all conducted in highly developed countries, which begs the question if there is a relation to culture and compulsory treatment for AN, or the reporting thereof. Therefore, future studies should seek to consistently report the application of "formal compulsion". Lastly, the role of cross-cultural differences in the onset, course, and treatment of AN should be explored.

Conclusions

We found noteworthy common factors among youth who received formal compulsory treatment for AN. This group of patients may suffer from AN for several years, try multiple forms of therapy, and experience multiple hospitalisations before compulsory interventions are initiated. These individuals often experience instability and adversity during their childhood and/or adolescence. They may also suffer from various comorbidities before the onset of AN or develop comorbidities during treatment. Combinations of complex trauma, prolonged familial and other social stressors, and a growing anorexic identification, compounded by repeated failure of treatment and isolation in clinical care, all contributed to illness deterioration and treatment refusal. Furthermore, while the iatrogenic harms of prolonged hospitalisation may disrupt normal social functioning and strengthen the anorexic identification, it is important to recognise that the relationship between difficult treatment experiences and solidification of the anorexic identity is likely bidirectional. For these youth, AN may remain refractory to treatment and may become an increasingly (relatively) safe alternative to dealing with a progressively complicated life. Unfortunately, these factors provided little framework for prevention strategies. However, the various factors associated with the development and deterioration of AN, including the broad variability of personal characteristics, contextual factors, and treatment factors must be acknowledged during treatment. Early identification of key characteristics associated with severe illness deterioration and the potential need for compulsory treatment could be informative for personalising early, effective, and potentially less invasive treatment interventions during the early stages of illness. Solely addressing the symptoms of restrictive eating and weight loss is insufficient for these youth who eventually deteriorate to a point where they require compulsory treatment. Furthermore, while focusing on the causes of AN in treatment remains imperative, prioritising quality of life may enhance patients' perspectives and motivation for treatment, setting the stage for more successful treatment.

Conflict of interest

The authors declare that there are no conflicts of interest related to this research.

Data availability statement

All data supporting the findings in this systematic review are included in the references list and appendices. Additional data, if needed, may be obtained from the corresponding author upon reasonable request.

Author contributions

TO, LN, BV and RV were responsible for initial conceptualisation and methodological planning. Authors TO, BV carried out the data collection and selection under supervision of LN. Formal data analysis was carried out by TO, with supervision of LN. The project administration was managed by TO. Authors BV, LN and RV were responsible for result validation. TO wrote the original draft, to which BV, LN and RV provided review.

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Appendix A. Search Term

PubMed

((eating[ti] AND disorder*[ti]) OR “Feeding and Eating Disorders”[Mesh] OR “Eating Disorder*”[tw] OR “Anorexia”[Mesh] OR anorexi*[tw]) AND (“Involuntary Treatment”[Mesh] OR “Mandatory Programs”[Mesh] OR “Coercion”[Mesh] OR compuls*[tw] OR mandator*[tw] OR coerc*[tw] OR involuntar*[tw] OR forced[tw] OR “legislation and jurisprudence” [Subheading] OR “Treatment Refusal”[Mesh] OR refus*[tw]) AND (child*[tiab] OR schoolchild*[tw] OR adolescen*[tw] OR pediatri*[tw] OR paediatr*[tw] OR boy[tw] OR boys[tw] OR boyhood[tw] OR girl[tw] OR girls[tw] OR girlhood[tw] OR youth[tw] OR youths[tw] OR teen[tw] OR teens[tw] OR teenager*[tw] OR puberty[tw] OR Juvenile*[tw] OR “Adolescent”[Mesh] OR adolescen*[tw] OR “Minors”[Mesh] OR minors[tw] OR “Young Adult”[Mesh] OR “young adult*”[tw] OR preadolescen*[tw] OR prepube*[tw] OR preadolescen*[tw] OR “junior high*”[tw] OR highschool*[tw] OR “high school*”[tw] OR “senior high”[tw] OR “young people*”[tw] OR “students”[mesh] OR “student*”[tw]) NOT (“Letter”[Publication Type] OR “Editorial”[Publication Type] OR “Comment”[Publication Type])

Embase

((eating.ti. AND disorder*.ti.) OR eating disorder/ OR exp anorexia nervosa/ OR “Eating disorder*”.ti,ab. OR exp anorexia/ OR anorexi*.ti,ab.) AND (exp involuntary commitment/ OR exp mandatory program/ OR exp persuasive communication/ OR compuls*.ti,ab. OR mandator*.ti,ab. OR coerc*.ti,ab. OR involuntar*.ti,ab. OR forced.ti,ab. OR exp law/ OR exp jurisprudence/ OR exp treatment refusal/ OR refus*.ti,ab.) AND (child*.ti,ab. OR schoolchild*.ti,ab. OR adolescen*.ti,ab. OR pediatri*.ti,ab. OR paediatr*.ti,ab. OR boy.ti,ab. OR boys.ti,ab. OR boyhood.ti,ab. OR girl.ti,ab. OR girls.ti,ab. OR girlhood.ti,ab. OR youth.ti,ab. OR youths.ti,ab. OR teen.ti,ab. OR teens.ti,ab. OR teenager*.ti,ab. OR puberty.ti,ab. OR Juvenile*.ti,ab. OR exp adolescent/ OR adolescen*.ti,ab. OR exp “minor (person)”/ OR minors.ti,ab. OR exp young adult/ OR “young adult*”.ti,ab. OR preadolescen*.ti,ab. OR prepube*.ti,ab. OR preadolescen*.ti,ab. OR “junior high*”.ti,ab. OR highschool*.ti,ab. OR “high school*”.ti,ab. OR “senior high”.ti,ab. OR “young people*”.ti,ab. OR exp

Medline

((eating.ti. AND disorder*.ti.) OR eating disorder/ OR exp anorexia nervosa/ OR “Eating disorder*”.ti,ab. OR exp anorexia/ OR anorexi*.ti,ab.) AND (exp involuntary commitment/ OR exp mandatory program/ OR exp persuasive communication/ OR compuls*.ti,ab. OR mandator*.ti,ab. OR coerc*.ti,ab. OR involuntar*.ti,ab. OR forced.ti,ab. OR exp law/ OR exp jurisprudence/ OR exp treatment refusal/ OR refus*.ti,ab.) AND (child*.ti,ab. OR schoolchild*.ti,ab. OR adolescen*.ti,ab. OR pediatri*.ti,ab. OR paediatr*.ti,ab. OR boy.ti,ab. OR boys.ti,ab. OR boyhood.ti,ab. OR girl.ti,ab. OR girls.ti,ab. OR girlhood.ti,ab. OR youth.ti,ab. OR youths.ti,ab. OR teen.ti,ab. OR teens.ti,ab. OR teenager*.ti,ab. OR puberty.ti,ab. OR Juvenile*.ti,ab. OR exp adolescent/ OR adolescen*.ti,ab. OR exp Minors/ OR minors.ti,ab. OR exp young adult/ OR “young adult*”.ti,ab. OR preadolescen*.ti,ab. OR prepube*.ti,ab. OR preadolescen*.ti,ab. OR “junior high*”.ti,ab. OR highschool*.ti,ab. OR “high school*”.ti,ab. OR “senior high”.ti,ab. OR “young people*”.ti,ab. OR exp student/ OR “student*”.ti,ab.) NOT (editorial.pt. OR comment.pt. OR letter.pt.)

PsycINFO

((TI eating AND TI disorder*) OR DE “Eating Disorders” OR DE “Anorexia Nervosa” OR TX anorexi*[tw]) AND (DE “Involuntary Treatment” OR DE “Coercion” OR DE “Persuasive Communication” OR TX compuls* OR TX mandator* OR TX coerc* OR TX involuntar* OR TX forced OR DE “Law Enforcement” OR DE “Treatment Refusal” OR refus*[tw]) AND (TI child* OR AB child* OR TX schoolchild*OR TX adolescen*OR TX pediatri*OR TX paediatr*OR TX boy OR TX boys OR TX boyhood OR TX girl OR TX girls OR TX girlhood OR TX youth OR TX youths OR TX teen OR TX teens OR TX teenager* OR TX puberty OR TX Juvenile* OR DE “Adolescent Psychology” OR DE “Adolescent Health” OR DE “Adolescent Attitudes” OR DE “Adolescent Characteristics” OR DE “Early Adolescence” OR DE “Adolescent Psychotherapy” OR DE “Adolescent Psychiatry” OR DE “Adolescent Development” OR DE “Adolescent Behavior” OR DE “Adolescent Characteristics” OR DE “Adolescent Health” OR DE “Early Adolescence” OR DE “Adolescent Behavior” OR TX adolescen* OR TX minors OR DE “Emerging Adulthood” OR TX “young adult*” OR TX preadolescen* OR TX prepube* OR TX preadolescen* OR TX “junior high*” OR TX highschool* OR TX “high school*” OR TX “senior high” OR TX “young people*” OR DE “students” OR TX “student*”)

Web of science Core Collection

(TI=(eating AND disorder*) OR TS=(“Eating Disorder*” OR anorexi*)) AND TS=(compuls* OR mandator* OR coerc* OR involuntar* OR forced OR refus*) AND TS=(child* OR schoolchild* OR adolescen* OR pediatri* OR paediatr* OR boy OR boys OR boyhood OR girl OR girls OR girlhood OR youth OR youths OR teen OR teens OR teenager* OR puberty OR Juvenile* OR adolescen* OR minors OR “young adult*” OR preadolescen* OR prepube* OR preadolescen* OR “junior high*” OR highschool* OR “high school*” OR “senior high” OR “young people*” OR “student*”)

Appendix B. Data extraction form

Name Reviewer:

Date of review:

Study number:

Bibliographic information

Title:

Authors:

Year published:

Reference:

DOI:

Study design:

Research question/Aim:

Study methodology:

Setting

Country:

Time of study:

Domain + care setting:

Target population (youth)

Age:

Gender:

Ethnicity:

Problem/diagnosis:

Sample size

Comorbidities

Inclusion criteria

Interventions:

Treatment types:	
Treatment setting:	
Duration of treatment:	
Invoked laws:	(e.g., mental healthcare act, parental guardianship, medical treatment agreement)

Risk factors and characteristics

Patient characteristics	(e.g., character traits, age, weight)
Contextual factors	(e.g., family characteristics, family situation, familial comorbidities)
Treatment factors	(e.g., waiting times, received forms of treatment, duration of treatment, (dis)continuity of care)
Life events	(e.g., impactful or traumatic events)
Other characteristics in relation to compulsion	(Other factors not encompassed in other categories)
Direct risk factors?	
Comparisons of factors between involuntary vs. Voluntary care groups	(In case comparisons are made within the publication)
Authors' conclusion(s) in relation to factors ^	
Authors' discussion in relation to factors ^	
Authors' Recommendations	

Source of evidence (check applicable option)

☐ Evidence from patient files or professional observations
☐ Evidence directly from studies to youth
☐ Evidence directly from studies to parents
☐ Evidence directly from studies to CAP practitioners
☐ Evidence directly from studies to policy makers/managers
☐ Evidence from jurisprudence perspective

Conflict of interest reported by publication author Yes No Unclear

Critical appraisal: High Medium Low

Third order evaluative summary of results (after coding)

Comments by reviewer:

Limitations according to publication author: