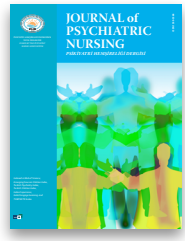
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Systematic Review

Current approaches to assessing and managing anger and aggression

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Abstract

Objectives: This study aims to systematically review previously published studies conducted in Türkiye on the assessment and management of anger and aggression among adolescents and young adults and to present the general characteristics of the selected studies.

Methods: This study examined theses and articles published in Türkiye between 2013 and 2023 on the subject among adolescents and young adults aged 14–25. Online search engines (Google Scholar, YÖK) were used to access the studies. The keywords "anger," "anger management," "anger management training," "anger control," "anger control training," and "aggression" were used when searching databases. The PRISMA checklist, preferred for systematic reviews and meta-analyses, was used when reviewing studies in this systematic review.

Results: A total of 1,354 studies were retrieved through electronic databases. Of these, 1,261 studies that did not meet the criteria were removed. Ultimately, 21 studies were systematically presented. It was found that the Trait Anger-Anger Style Scale is the most widely used measurement tool for assessing anger, while the Aggression Scale, the Reactive-Proactive Aggression Scale, and the Buss-Perry Aggression Scale have been used for assessing aggression. Cognitive-behavioral and skill-based approaches to managing anger and aggression in adolescents and young adults have been determined to be the most widely studied and empirically validated treatment approaches.

Conclusion: In conclusion, the results of this systematic review are crucial for mental health and psychiatric nurses to know and use appropriate assessment tools when assessing individuals with anger expression problems. Mental health and psychiatric nurses' knowledge of cognitive behavioral therapy-based anger management interventions and their ability to integrate these methods into nursing care will improve the quality of healthcare. Further studies utilizing techniques from different approaches to anger management are recommended.

Keywords: Aggression; aggression management; anger; anger management

Anger is an emotion experienced in relation to both personality structure and psychological problems.[1] Anger and its expression have become significant public health and mental health concerns, especially for children, adolescents, and young adults today. Epidemiological studies have shown that problems related to anger, such as oppositional behavior, verbal and physical aggression, violence, and irritability, are among the reasons children are referred to mental health services.[2–4] The signs of anger are commonly observed among childhood and adulthood mental disorders, such as personality disorders, attention deficit hyperactivity disorder, conduct disorder, oppositional defiant disorder, bipolar disorder, organic brain diseases, and various conditions resulting from trauma.[5] The type of anger most commonly encountered by clinical nurses in both inpatient and outpatient treatment settings is uncontrolled anger.[6] In this study, the initial aim is to present the relevant literature on the structure of anger, the concepts of anger, hostility, and aggression, the expression of

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anger, risk factors, and the clinical aspects and consequences of anger. Subsequently, the measurement tools and intervention approaches currently used in our country for the management of anger and aggression are systematically presented.

The Structure of Anger

Raymond W. Novaco[7] describes anger as a primary emotion that has adaptive functions connected to survival mechanisms, which are inherently biological, psychological, and social in nature. This emotion is initiated by cognitive processes such as the perception of threat and continues with physiological responses, including mobilization of energy, muscle tension, increased heart rate, elevated blood pressure, and higher levels of adrenaline and noradrenaline. While these physiological changes alone are not sufficient to result in aggressive or violent behavior, anger can trigger such behaviors when regulatory control mechanisms fail. Uncontrolled anger, in addition to being a risk factor for violence, can also impair social relationships, work performance, and health, manifesting itself in various social domains.[7–9]

Some researchers have stated that anger is a human emotion and that the arousal (activation) of anger is connected to the perception of threat and self-preservation. Therefore, anger can be seen as a fundamental human emotion programmed for survival and sustaining life.[7,10] As a normal human emotion, anger can mobilize psychological resources in the face of distress, energize behaviors to solve problems, and foster determination. Anger serves as a protector of self-esteem, functions as a means of expressing negative emotions, strengthens the ability to voice complaints, and increases determination to overcome obstacles to happiness and desires.[11] In this sense, anger is a necessary emotion for sustaining one's life.

On the other hand, according to other researchers, anger is defined as a state of aroused hostility toward someone or something perceived as the source of a negative event or as a basic and subjectively experienced negative emotion that results from the obstruction of a goal or from provocation, such as verbal or physical attack.[7,9] The reason anger is classified as a negative emotion may stem from its association with aggression and hostility. In such problematic situations, the main feature of anger is its "uncontrolled" nature. The activation, expression, and experience of anger do not occur appropriately. Although this normal emotion does not automatically have the status of a problem, it becomes problematic due to its reciprocal links with life stress, psychopathology, and harmful behaviors, leading to negative outcomes for oneself and others.[11] Judging whether someone has an "anger problem" depends on observations and the sociocultural environment in which they are situated. Evaluation can be based on the anger patterns the individual uses (such as how often they get angry, the intensity of the anger experienced, how long the arousal lasts, and how the person behaves when angry).[11]

What is presently known on this subject?

- Anger is an emotion experienced in relation to both personality structure and psychological problems.
- Anger and its expression have become significant public health and mental health concerns, especially for children, adolescents, and young adults today.
- It is known that anger management training helps adolescents and young adults manage their levels of anger and ways of expressing anger.

What does this article add to the existing knowledge?

- It is shown that anger management training has positive effects on adolescents and young adults by reducing their levels of persistent anger, improving their ways of expressing anger, enhancing anger control skills, assertiveness, and communication abilities, as well as emotional regulation skills, psychological resilience, social problem-solving abilities, constructive conflict resolution skills, and decreasing aggressive behaviors, tendencies toward violence, hostile thoughts, and submissive behaviors.

What are the implications for practice?

- The studies included in the systematic review confirm the effectiveness of Cognitive Behavioral Therapy-based interventions for anger management.
- It is observed that there is a need for intervention programs based on different theoretical approaches.
- It is determined that almost all programs are effective, but significant results are not achieved in some sub-problems.

Anger, Hostility, and Aggression

Although the concept of anger is sometimes used interchangeably with hostility and aggression, there are significant conceptual distinctions and theoretical relationships among these three constructs.[9,12]

Anger is generally considered a simpler concept than hostility or aggression. Spielberger et al.[13] view the emotion of anger in terms of both trait and state dimensions. According to them, state anger is an emotional condition that reflects objective feelings such as tension, irritation, annoyance, or rage in response to goal blocking or perceived injustice. Trait anger, on the other hand, refers to how frequently state anger is typically experienced. The concept of anger generally involves an emotional state that ranges in intensity from mild annoyance or irritation to intense fury.[13] Although hostility often includes feelings of anger, the term refers to attitudes made up of associations that motivate aggressive behaviors aimed at destroying objects or harming others.[9] In the Buss and Perry Aggression Questionnaire, the hostility subscale includes items that refer to thoughts of being treated unfairly in life, while the anger subscale contains items related to becoming angry easily and being unable to control anger.[14] Hostile thoughts include themes of cynicism, contempt, jealousy, distrust, resentment, suspicion, and injustice. Hostility can exist independently as a stream of thought that precedes a full anger response, or it can take the form of rumination. Hostile thoughts typically arise as a reaction to the perception that another person intends to cause harm. Some people react more strongly than others to certain types of social threats, such as injustice or situations that threaten their self-esteem.[9] While the concepts of anger and hostility refer to emotions and attitudes, the concept of aggression gen-

erally encompasses destructive or punitive behaviors directed toward other people or objects.[13] Aggression is defined as a behavior directed with the intent to harm someone.[9]

In conclusion, these three concepts can be considered as follows: "anger" as an emotion, "hostility" as a thought, and "aggression" as a behavior. When these three dimensions come together, they form what is known as the AHA syndrome (Anger, Hostility, and Aggression). Anger hereby serves as the emotional component, hostile thoughts as the attitudinal component, and aggression as the behavioral component.[15]

Expression of Anger

Experiencing anger and expressing it are distinct matters. Most of the problematic aspects of anger are related to its mode of expression.[13,16] To experience anger is to feel an emotional state often accompanied by physiological reactions. Anger expression, on the other hand, is the behavioral aspect of how a person manages and copes with their feelings of anger.[13] While expressing anger may be culturally frowned upon in some societies, it is perfectly normal to get angry and express it from time to time.[17] The expression of anger can take many forms, including violence, self-harm, and, more commonly, physical and verbal aggression. The expression of anger can also manifest in different ways depending on an individual's developmental age.[6] However, anger can provide valuable information and be constructive. A person may genuinely experience disrespect, insult, or some other injustice. In some situations, the offender may have unintentionally caused provocation. Expressing a grievance can help repair a social relationship constructively. In certain cases, anger may be morally justified and serve to deter unethical behavior.[9]

Spielberger et al.[13] divide forms of anger expression into three categories: anger-in, anger-out, and anger control. Anger-in is defined as directing anger toward oneself, denying thoughts or memories related to the anger-provoking situation, or denying the feeling of anger itself. The greatest risk of anger that is unexpressed and becomes chronic is its negative impact on an individual's health. Anger that is not properly expressed and is suppressed is found to be associated with gastrointestinal symptoms[18] and postpartum depression.[19] Anger-out is defined as expressing anger toward another person or object in various ways, including physical actions, criticism, insult, or verbal abuse. When anger is not expressed appropriately and is directed outward, it is found to be significantly higher in clinical samples with emotional and behavioral problems compared to healthy controls.[20] It is determined that elevated levels of both inwardly and outwardly directed anger, compared to healthy controls, predispose individuals to suicide attempts and social anxiety disorder.[21,22] Anger control is defined as the effort to manage, control, and express feelings of anger by using non-aggressive words while respecting the rights and feelings of others.[13] It is found that the level of anger control is lower in individuals with suicide attempts and social anxiety disorder than in healthy controls.[21,22] Preventing and regulating uncontrolled anger should be among the priorities of mental health, as anger can have serious consequences for physical and psychological well-being. There is no doubt about the relationship between anger and various behavioral, personality, and psychosomatic disorders.[23,24]

Risk Factors Related to the Level and Expression of Anger

It is determined that there are numerous factors influencing the level and expression of anger. Özmen et al.[25] have found that the most significant factors affecting adolescents' anger levels and styles of expression are anxiety, gender, and family type. In a study on adolescents, Anjanappa et al.[26] determine that a child's age, family structure, gender, and mother's educational level are statistically significantly associated with adolescents' levels of anger. It is also observed that males experience anger more frequently throughout the day compared to females.[26]

In a study conducted with adults, it is found that gender, ethnicity, income level, marital status, employment status, adverse childhood experiences (such as physical abuse and neglect), having a parent with behavioral problems, having had a psychiatric illness in the past twelve months, and having a physically violent partner during adulthood are all associated with higher levels of anger. It is seen that among psychiatric illnesses, individuals diagnosed with bipolar disorder, substance use disorders, and psychotic disorders exhibit the highest levels of anger. It is determined that the likelihood of all personality disorders is also significantly higher among angry individuals. The personality disorders most frequently observed in this group are borderline, schizotypal, narcissistic, and dependent personality disorders. Individuals with high levels of anger are also found to have a significantly greater likelihood of using substances, alcohol, and tobacco compared to those who are not angry.[27]

Karababa and Dilmaç[28] have identified human values, Ayyıldız and Ekin[29] have found attachment styles, and Kerman[30] has established alexithymia and emotional intelligence as factors related to the level and expression of anger.

Anger as a Clinical Problem and Its Consequences

In the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), a mental disorder is defined as "a syndrome characterized by a clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or

developmental processes underlying mental functioning."[5] Therefore, anger, which can lead to negative outcomes such as violence and incarceration, does not in itself constitute a mental disorder. However, aggressive or severe anger increases the likelihood of significant dysfunction in actions, thoughts, or emotional control, making it maladaptive.

Anger is not classified as a separate diagnostic category in the DSM-5, unlike depression and anxiety. However, many disorders in the diagnostic system list anger as a symptom.[5] On the other hand, anger is present as a symptom in many disorders within the diagnostic classification system. Anger experiences vary in intensity, ranging from occasional, everyday anger to clinical levels that lead to serious consequences such as physical aggression and violence.

When considering anger as a symptom accepted by psychiatric classification systems, it should be recognized that uncontrolled anger indicates a disorder. Uncontrolled anger is defined as the inability to regulate anger, expressing it inappropriately, feeling it excessively, directing it toward unsuitable people or objects, or expressing it due to external motivations. When individuals experience and express anger in ways that are entirely disproportionate to the triggering circumstances, anger becomes uncontrolled. In these scenarios, anger responses are not appropriate to the precipitating events or interpretations; what stands out is the magnitude and intensity of the individual's anger reactions. A common feature of anger-related disorders is excessive outward expression of aggression.[31]

Intense anger can lead to negative outcomes in various contexts, such as reactive aggression, child and spousal abuse, dangerous driving, road rage, assault, and even homicide.[9] Anger and closely related traits such as hostility and aggression are generally associated with an increased risk of chronic vascular diseases and, more specifically, chronic heart disease.[32,33]

Whether anger is problematic can be measured by its frequency, intensity, duration, and mode of expression. Uncontrolled anger emerges in various personality, psychosomatic, and behavioral disorders, as well as in schizophrenia, mood disorders, organic brain disorders, impulse control disorders, and conditions arising from trauma.[34,35] It is found in one study that destructive anger outbursts are associated with newly onset major depression, generalized anxiety disorder, panic disorder, and suicidal ideation.[36]

In psychopathologies, uncontrolled anger arises as a product of transdiagnostic processes such as selective attention, threat perception, interpretation bias, rumination, and deficits in self-control. As defined by clinical staff and patients themselves, anger is a common issue among both inpatient and outpatient psychiatric patients. In fact, it is seen that anger is related to violent behaviors before, during, and after psychiatric hospitalization.[7] Individuals with various psychiatric disorders may suffer from feelings of anger that sometimes lead to maladaptive (e.g., aggressive) behaviors. Persistent anger and anger attacks are linked to depressive and anxiety disorders, although the strength of this connection may differ between the two types of anger.[37,38]

Materials and Method

Study Protocol

The aim of this study is to introduce some of the commonly used measurement tools for the assessment and intervention of anger and aggression. In addition, this study systematically reviews previously conducted and published studies in our country regarding the management of anger and aggression in adolescents and young adults, presenting the general characteristics of studies that meet the research criteria (type of study, year of study, sample size, profession of the practitioner, setting, underlying therapeutic approach, number of sessions, duration, frequency, study design, outcome variables, presence of effect size, follow-up, and level of evidence). Accordingly, graduate theses and published research articles from our country have been examined. As a sample research protocol, the PRISMA checklist (PRISMA Checklist 2020), recommended by Grove,[39] has been used for systematic reviews.[40] The PRISMA guideline is still considered the gold standard for reporting systematic reviews and meta-analyses.

Inclusion Criteria

The selection criteria for studies included in this systematic review have been determined according to PICO (sample, intervention, comparison, and outcome) (Table 1).[41]

Exclusion Criteria

The excluded works include books, letters to the editor, systematic review studies, abstracts, posters, and conference

Table 1. PICO Format

P (Participants)	Adolescents and young adults aged 14–25
I (Interventions)	Anger management training based on non-pharmacological therapy, anger control training
C (Comparison)	Comparison with the group that did not receive anger management training, with pre-intervention status, and with other anger management interventions based on different approaches
O (Outcomes)	Trait and state anger, anger expression styles, aggressive behavior
S (Study design)	Experimental and quasi-experimental studies

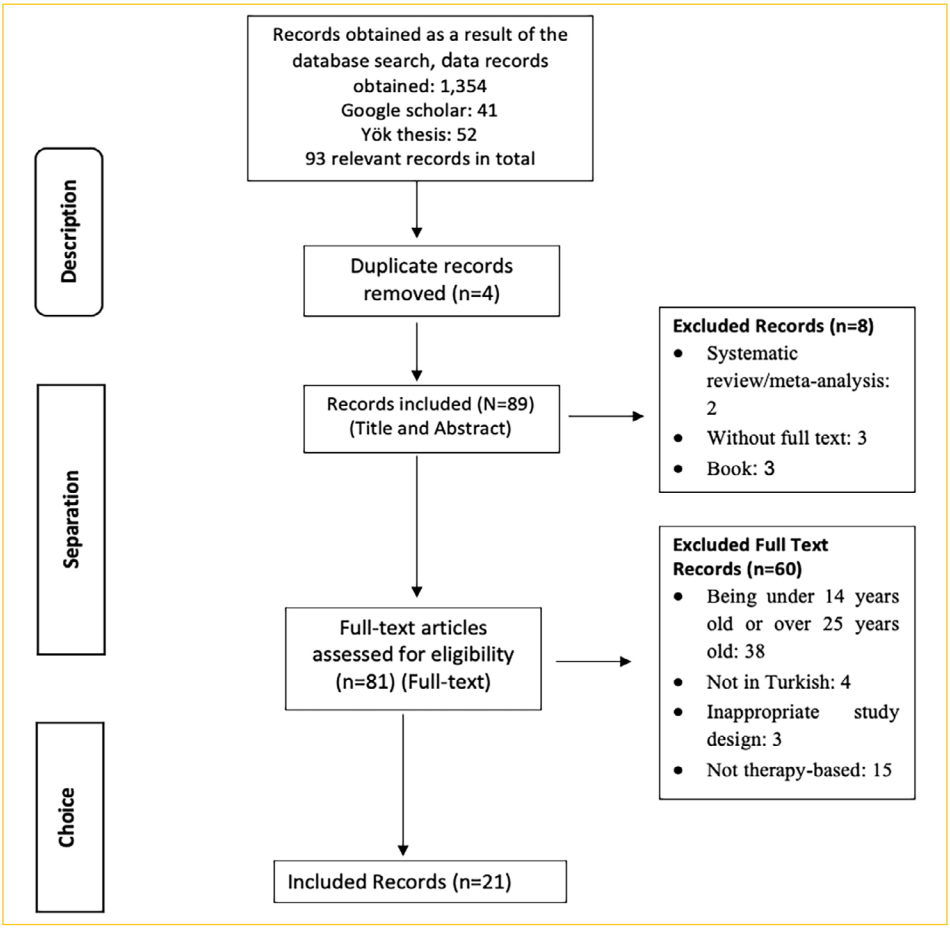


Figure 1. PRISMA Flow Chart.

materials, other non-experimental or non-quasi-experimental studies, studies without full text, studies not published in Turkish, and studies not published in our country.

Research Questions

- What measurement tools are used in the assessment of anger and aggression?
- What are the current approaches to the management of anger and aggression?

Data Collection Process

During the data collection process of the research, theses and articles in Turkish with full text available from 2013 to 2023 have been reviewed. If a thesis has also been published as a Turkish article, the article has been preferred. For the literature search, online search engines (Google Scholar, YÖK Thesis) have been used. Search keywords have been adjusted according to MeSH terms for health research. The search terms used include: "anger," "anger management" or "anger management training" or "anger control," "anger control training," and "aggression."

The electronic database search has been conducted independently by two authors (FKS, OUT). Any discrepancies have been resolved by consulting other researchers (NBD, BA, NK) for consensus. Through electronic databases and online sources, a total of 1,354 studies have been accessed. Of these, 1,261 studies have been excluded because they are not relevant to the research. The remaining 93 theses and articles have been reviewed according to the inclusion and exclusion criteria. Finally, 21 documents have been systematically analyzed. The PRISMA flow diagram is shown in Figure 1.

Data Analysis

After obtaining the full texts, the articles have been reviewed. The articles and theses have been categorized according to their authors, years, number of sessions, duration and frequency, sample characteristics, intervention method, outcomes, effect size, follow-up status, and level of evidence. The results of anger management training in the articles and theses have been emphasized.

Results

Descriptive Characteristics of the Studies

While reviewing the studies, it is found that the total sample size was 48.19±34.97 (ranging from 18 to 147), 38.1% are doctoral theses, 57% of the studies are conducted be-

Table 2. Descriptive characteristics of the studies selected for systematic review

	n	%
Type of publication		
Doctoral dissertation	8	38.1
Master's thesis	7	33.3
Article	6	28.6
Year of study		
2013-2017	9	43
2018-2023	12	57
Design		
Quasi-experimental	12	57.1
Randomized controlled trial	9	42.9
Follow-up		
Yes	10	47.6
No	11	52.4
Effect size		
Yes	6	28.6
No	15	71.4
Level of evidence		
II	9	42.9
III	12	57.1
Number of sessions		
2 sessions	1	4.8
5 sessions	1	4.8
6 sessions	4	19
7 sessions	2	9.5
8 sessions	4	19
9 sessions	1	4.8
10 sessions	5	23.8
12 sessions	2	9.5
30 sessions	1	4.8
Session duration		
40-50 min.	5	23.8
55-60 min.	4	19
70-90 min.	8	38.1
120 min.	3	14.3
Not mentioned	1	4.8
Session frequency		
Every two weeks	1	4.8
Once a week	18	85.7
Once-twice a week	1	4.8
Twice a week	1	4.8
Profession of the program implementer		
Specialist nurse	10	47.6
Guidance and psychological counseling specialist	9	42.9
Clinical psychologist	2	9.5
Environment where the study was conducted		
Penitentiary institution	2	9.5
Children's home	1	4.8
School (high school)	14	66.7
School (higher education)	4	19
Aproaches		
CBT	9	42.9
CBT and Rational Emotive Behavior Therapy	1	4.8
CBT and Gross Emotion Regulation Model	1	4.8
Rational Emotive Behavior Therapy	1	4.8
Mindfulness	1	4.8
Creative Drama	1	4.8
Psychodrama	1	4.8
Systemic Family Therapies	1	4.8
Dialectical Behavior Therapy	1	4.8
Acceptance and Commitment Therapy	1	4.8
Solution-Based Approach	2	9.5
Emotional Freedom Technique, Progressive Muscle Relaxation Technique	1	4.8
Outcome variable		
Trait anger/anger expression	8	38.1
Anger Control	9	42.9
Aggression	2	9.5
Anger and aggression	2	9.5
Scales used in the assessment of anger and aggression		
Trait Anger/Anger Expression Scales	15	71.4
Buss-Perry Aggression Questionnaire	1	4.8
Reactive-Proactive Aggression Questionnaire	1	4.8
Aggression Questionnaire /Scale	2	9.5
Brief symptom Inventory	1	4.8
Multidimensional Anger Scale	1	4.8
	Min-Max	**Mean±SD**
Total sample size	18-147	48.19±34.97

CBT: Cognitive Behavioral Therapy

tween 2018 and 2023, 57.1% are quasi-experimental, follow-up measurements are present in 52.4%, and effect size is not reported in 71.4%. Additionally, 57.1% are classified as Level III evidence, 23.8% include 10 sessions, 38.1% have session durations of 70–90 minutes, and 85.7% have sessions held once per week. It is also determined that 47.6% of the interventions are carried out by specialist nurses, 66.7% of the study settings are schools (high schools), and 42.9% of the primary outcome variables measured are anger control (Table 2).

Table 3. Scales that can be used to assess anger and aggression

Scale	Writer(s)	Age(s)	Source
Trait Anger-Anger Expression Scales (STAXI)	Özer, 1994[42]	High School, university and adults	https://toad.halileksi.net/
State-Trait Anger Expression Inventory for Children and Adolscents (STAXI-2 C/A)	Kıralp, 2013[43]	9-18 ages	https://tez.yok.gov.tr/
Brief symptom Inventory (BFI)	Şahin et al. (2002)[47]	Adolescents	https://toad.halileksi.net/olcek/kisa-semptom-envanteri-kse/
Multidimensional Anger Scale (MAS)	Balkaya & Şahin, 2003[45]	14-50 ages	https://toad.halileksi.net/
Aggression Questionnaire (AQ) Aggressiveness Scale (AS)	Can, 2002[46] Tuzgöl Dost[45]	9 and above 14-15 ages	https://tez.yok.gov.tr/ https://toad.halileksi.net/
Buss-Perry Aggression Questionnaire (BAQ)	Madran, 2012[14]	17-20 ages	https://scholar.google.com/
Reactive-Proactive Aggression Questionnaire (RPQ)	Cenkseven- Önder et al. 2016[48]	10-19 ages	https://scholar.google.com/

Assessment of Anger and Aggression

When examining the measurement tools used to assess anger and aggression, it is found that the Trait Anger–Anger Expression Scales are used in 71.4% of the studies, while the Aggression Scale is used in 9.5% of the studies. The Reactive-Proactive Aggression Scale, the Multidimensional Anger Scale, the Buss-Perry Aggression Questionnaire, and the Brief Symptom Inventory are each used at a similar rate of 4.8% (Table 2, 3).

Current Approaches in the Management of Anger and Aggression

According to Table 2, it is found that 42.9% of the intervention programs are based on Cognitive Behavioral Therapy (CBT), while 9.5% are grounded in the Solution-Focused Approach. The remaining schools of thought are each used in a single study and with equal frequency. These approaches include combinations such as CBT and Rational Emotive Behavior Therapy, CBT and the Gross Emotion Regulation Model, as well as Mindfulness, Creative Drama, Psychodrama, Systemic Family Therapies, Dialectical Behavior Therapy, Acceptance and Commitment Therapy, Emotional Freedom Technique (EFT), and Progressive Muscle Relaxation Technique (PMRT). The characteristics of the intervention programs are presented in Tables 2 and Appendix 1-3.

Discussion

In this systematic review, the aim is to identify current approaches for the assessment and management of anger and aggression. When nurses assess anger, they should gather information from multiple sources regarding the current problem, past psychiatric history, family history, developmental and social background, and psychosocial stressors. In addition, certain measurement tools may be utilized by nurses to evaluate anger and aggression in adolescents and young adults. In line with the first research question, the most commonly used assessment tools for anger and aggression are the Trait Anger–Anger Expression Style Scale and the Aggression Scale.

The Trait Anger Scale was developed and studied by Charles D. Spielberger and colleagues beginning in the early 1980s, with the Anger Expression Style Scales introduced in 1988.[42] Similar to his approach to anxiety, Spielberger conceptualizes both state and trait perspectives regarding anger. State anger measures the intensity of anger experienced at a particular moment, ranging from mild irritation to severe anger in response to provocation. Trait anger, on the other hand, assesses how frequently a person generally experiences anger.[42]

Besides examining the distinction between state and trait anger, it is also considered important to assess how anger is expressed. Therefore, the Anger Expression Style Scales were developed, consisting of three subscales: Anger-In, Anger-Out, and Anger Control.[9,42] In our country, the first validity and reliability studies of these scales were conducted by Özer[31] in a sample of high school students, university students, and adults, and subsequently in individuals with hypertension. Later, Kıralp[43] evaluated the validity and reliability of the State-Trait Anger Expression Inventory for Children and Adolescents in a sample aged 9 to 18 years.

According to the current research findings, other less frequently used assessment tools include the Aggression Scale, Brief Symptom Inventory, Multidimensional Anger Scale, Buss-Perry Aggression Questionnaire, and the Reactive-Proactive Aggression Questionnaire. Can[44] conducted the validity and reliability studies of the Aggression Scale in his specialization thesis. The scale requires the use of separate forms for ages 9–18, 19–39, and over 40. It evaluates aggression across five subscales: physical aggression, verbal aggression, anger, hostility, and indirect aggression.[44] Another Aggression Scale was developed by Tuzgöl Dost[45] in a master's thesis in 1998. This scale assesses aggression in five dimensions: overt, covert, physical, verbal, and indirect aggression.[45]

The Multidimensional Anger Scale was developed in Türkiye by Balkaya and Şahin in 2003. This tool evaluates anger through five subscales based on self-report: symptoms of anger, situations

triggering anger, thoughts related to anger, behaviors associated with anger, and interpersonal anger.[46] The Brief Symptom Inventory, developed by Derogatis in 1992, is a 53-item assessment tool. In Türkiye, its validity and reliability study for an adolescent sample was conducted by Şahin et al.[47] in 2002. Similar to its use in normal samples, it serves as a multidimensional symptom screening tool to identify symptoms in psychiatric cases. The inventory consists of five dimensions—depression, anxiety, negative self, somatization, and hostility—across 53 items.[47]

The Buss-Perry Aggression Questionnaire was developed by Buss and Perry in 2002. In our country, its initial validity and reliability studies were conducted by Madran[14] with a sample of university students. The scale evaluates aggression across four subscales: physical aggression, verbal aggression, hostility, and anger.[14] The Reactive-Proactive Aggression Questionnaire was developed by Raine and colleagues in 2006, and its Turkish validity and reliability study was conducted by Cenkseven-Önder et al.[48] This tool assesses aggression in two dimensions: reactive aggression and proactive aggression (Table 3).

In line with the second research question, it is determined that CBT-based intervention programs have been developed and implemented to address various mediators of anger and aggressive behavior during adolescence and young adulthood. It is observed that cognitive and behavioral techniques are utilized in these programs. The most commonly used cognitive techniques include goal setting, the ABC model, identifying cognitive distortions, and developing alternative thoughts. The most commonly used behavioral techniques include role-playing, social skills training, breathing exercises, and relaxation techniques.

There are studies focusing on anger control training aimed at developing anger management skills.[49,50] According to Şahin Vural,[49] following the CBT-based anger management program, participants' levels of trait anger, anger directed inward, and anger expressed outward decrease, while their anger control skills improve. However, it is also determined that this effect does not persist in the follow-up scores. Aktaş[50] found that in CBT-based anger management training, scores for trait anger, anger expressed inward, and anger expressed outward decrease, while anger control scores increase; furthermore, these effects persist during follow-up.

There are studies focused on developing anger management skills through anger control training, assertiveness skills, communication skills, and emotion regulation skills. Kelleci et al.[51–53] developed a training program focused on enhancing anger management and assertiveness skills to achieve effective anger control. After the intervention, assertiveness skills increased in the experimental group, while scores for trait anger, anger-in, and anger-out decreased, and anger control scores increased. Keçialan and Ocakçı[52] developed a training program focused on anger management and communication skills to help individuals gain control over their anger. After the intervention, participants' communication skills improved, but there was no change in their levels of trait anger or anger expression styles.

Akdemir and Gündüz[53] developed a training program focused on emotion regulation skills to reduce aggressive behaviors. At the end of the training sessions, adolescents who participated in the intervention group showed a decrease in emotion regulation difficulties and in reactive-proactive aggressive behaviors compared to those who did not participate.[53]

There are also studies that focus on developing social skills and moral reasoning to reduce anger and aggression.[54,55] Aggression Replacement Training, which aims to help children and adolescents develop adequate social skills, moral reasoning, and anger management abilities—and thereby reduce aggressive behaviors—was adapted by Kaya.[54] As a result of the study, levels of trait anger decreased, anger control increased, levels of physical aggression decreased, hostile thoughts diminished, and social problem-solving skills improved.[54]

In the study by Diksaç,[55] the aim was to reduce aggressive behavior and improve anger management and communication skills by enhancing social skills. As a result, participants showed decreases in physical and verbal aggression and hostility, as well as reductions in their levels of trait anger, while their anger control skills increased. Participants also improved their active listening, self-awareness, self-disclosure, and empathy skills.[55]

The SCARE anger intervention program, which aims to help individuals develop the skills needed to manage anger, aggressive behavior, and feelings of hostility, was adapted by Çelik.[56] As a result of the study, trait anger levels decreased, while there was no change in psychological resilience, emotional problems, behavioral problems, hyperactivity, peer problems, or social behaviors.[56]

In another intervention program focused on submissive behaviors, the aim was to reduce levels of anger and hostility by providing skills and awareness. According to the results of the intervention, participants who attended the training showed reduced levels of submissive behavior, interpersonal sensitivity, anger, and hostility. This decrease was also maintained in the follow-up assessment.[57]

There are also anger management programs developed based on second-generation cognitive behavioral approaches, specifically Rational Emotive Behavior Therapy (REBT).[58,59] Çetinkaya[58] has developed an intervention program focused on problem-solving skill training in his study. As a result of the intervention, it is determined that students' problem-solving skills have improved; it is effective in the positive development of anger control and interpersonal relationships, and this effect has been maintained over a long period. Similarly, in Zorlu's[59] study, it is found that after the implementation of an intervention program focused on anger control training, participants gain anger

control skills, and there is a decrease in the levels of trait anger, anger directed inward, and anger expressed outward. This improvement is also maintained during the follow-up period.[59]

It is observed that psychoeducational programs based on third-generation cognitive behavioral approaches (Acceptance and Commitment Therapy, Dialectical Behavior Therapy, and Mindfulness) are used to enhance anger management skills.[60–62] In his Acceptance and Commitment Therapy-based training program, Genç[60] aims to have a positive effect on psychological flexibility, empathy, and anger in children driven to commit offenses. In the training sessions, the explorer-observer-advisor values model, which teaches making behavioral choices aligned with one's values rather than acting on unhelpful impulses or immediate circumstances, is used as the foundation. After the intervention, levels of trait anger and anger-out have decreased, while anger control levels have increased.[60]

In the training program developed by Aydil[61] based on Dialectical Behavior Therapy, two sessions focus on mindfulness, four sessions on emotion regulation, and two sessions on increasing distress tolerance. After the training, participants' levels of trait anger and difficulties in emotion regulation have decreased, while there is no change in their distress tolerance skills.[61] Gülcan[62] has developed a mindfulness-based intervention program aimed at influencing persistent anger and anger expression style. After the intervention, participants' levels of trait anger, anger-in, and anger-out have decreased, while their anger control skills have improved.[62]

In addition, there are also studies that examine cognitive behavioral approaches in combination with other approaches.[63,64] Hoşrik Evren[63] utilized the Emotional Freedom Technique, which is one of the energy therapies, and Progressive Muscle Relaxation (PMR), a cognitive behavioral technique used in stress management, aiming to determine their impact on the image of God, tendency to forgive, anger control, and anxiety. As a result of the study, no difference has been found between the groups in terms of anger control. The anger control subscale has increased significantly in the PMR group after the intervention.

In his study, Ekitli Beycan[64] has developed an anger regulation intervention program by integrating the rhythm component of music with Gross's emotion regulation model and basic cognitive behavioral techniques. In the study, four separate groups are included. One group has received no intervention, another has received a combination of both interventions, and the remaining two groups have each received only rhythm or only education as the sole intervention. It is found that the combined intervention is significantly more effective than the other interventions in reducing persistent anger and increasing anger control. This effect has been sustained over a long period.

In training programs based on the solution-focused approach (SFA), SFA techniques such as the miracle question, nightmare question, scaling technique, forecasting the future, giving praise, role-playing, journaling, magic globe, and the cheerleader technique have been used. The aim is for participants to recognize, understand, and control their feelings of anger, as well as to reduce their tendencies toward violence.[65,66] According to Siyez and Tuna,[65] persistent anger and anger-out levels have decreased significantly compared to the control and placebo groups, while anger control levels have increased compared to the placebo group. There is no change in communication skills among the three groups. In Akbaş's [66] study, anger levels have also decreased, anger control levels have increased, and the tendency toward violence has decreased.

There is an intervention program developed for adolescents who exhibit aggressive behavior, which is based on family therapy theories and addresses both parents and adolescents. Kılıçarslan and Atıcı[67] have developed and evaluated a nonviolent resistance program for parents and an educational program for adolescents aimed at coping with violence and aggression. The program designed for adolescents aims to help them cope with tension experienced during conflicts by developing constructive conflict resolution, communication, and social skills, instead of resorting to attitudes and behaviors involving aggression, hostility, resentment, and hatred. In the parent sessions, skill-based sessions have been held, and additional sessions have been conducted that include family tree and family constellation techniques.

After the intervention, the level of aggressive behaviors among adolescents has decreased, and this reduction has continued during the follow-up. The Parental Stress Scale score has decreased, but this reduction does not persist at follow-up. The Family Assessment Scale score has decreased in the post-test, but this improvement is not maintained during follow-up.[67]

There is a study that addresses the theme of anger within a group setting by utilizing the principles and methods of psychodrama. According to Durmuş,[68] psychodrama techniques such as doubling, mirroring, role reversal, and surplus reality have been employed. Numerous objectives have been set, including enabling group members to recognize and express their feelings of anger, fostering awareness regarding their anger expression styles, and clearly expressing their anxiety about expressing anger. Other goals include allowing participants to experience different forms of emotional expression among others. As a result of the study, no significant differences have been found between the experimental and control groups in terms of trait anger and anger expression styles.[68]

There is a study demonstrating that creative drama-based interventions can be used in anger control groups. In their study, Çapacıoğlu and Demirtaş[69] focus on improving anger management skills in adolescents and address three outcomes related to anger: explaining the physical, emotional, and cog-

nitive effects caused by anger; evaluating the methods used to cope with anger in terms of their effects; and using constructive ways to cope with anger. As a result of the study, the level of trait anger has decreased in the experimental group, while the level of state anger has increased in the experimental group. Anger-out has decreased in the experimental group, while anger-in has increased. The anger control component is higher in the control group compared to the experimental group.

Limitation

The fact that the present study consists of Turkish-language theses and articles at the national level is a limitation.

Conclusion

Anger is a normal human emotion felt in response to unpleasant events. It has biological, psychological, social, and environmental determinants. Uncontrolled anger leads to impairment in functioning in various areas of life, is associated with several psychiatric disorders, and is a significant clinical issue affecting violent behavior in psychiatric patients. Therefore, knowing the tools used to assess anger and effective interventions for its management is of great importance for mental health and psychiatry professionals.

As seen in current research findings, the effectiveness of CBT-based interventions for anger control is well established. The results of the studies included in the systematic review confirm these effects. The scarcity of intervention programs based on different theoretical foundations is noteworthy. Thus, it is recommended to develop psychotherapeutic interventions based on various theoretical frameworks in this area. Furthermore, more research is needed that examines these variables together to determine whether the therapeutic reduction of anger in intervention programs is accompanied by a decrease in violent behaviors.

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Appendix 1. Research articles

Study	Sample	N	Approaches	Number of sessions	Method	Scales	Results	Follow-up	Effect Size	Level of evidince
Kelleci et al. (2014) [51]	9th grade high school	N:51 (24/27)	CBT	Experiment 10 sessions Once a week 90 min.	RCT	STAXI RAS	Trait Anger Experiment<control Anger Control Experiment>control Anger Out Experiment<control Anger In Experiment<control RAS Experiment>control	No	No	II
Siyez and Tuna (2014) [65]	High School 9th Grade	N:25 (8/9/8)	Solution-Based Approach	Experiment 10 sessions Placebo: support interview 10 sessions Once a week 45 min	Quasi experimental	STAXI CSES	Trait Anger Experiment<control, placebo Anger Control Experiment> placebo Anger out Experiment<control, placebo Anger In Experiment<control, placebo CSES Experiment=control=placebo	No	Yes	III
Kılıçarslan and Atıcı (2017) [67]	High School 9-10-11th grade	N:68 (34/34) Adoles-cent+parent	Systematic Family Therapies Theory	Experiment Adolescents 10 Parents 14 sessions Once a week 90 min	Quasi experimental	AS SPPR PSS FAD	AS Pre-test > post-test > follow-up SPPRC -Competence Pre-test<post-test=follow-up SPPRC Role Balance Pre-test<post-test=follow-up PSS Pre-test>post-test=follow-up FAD Pre-test>post-test=follow-up	Yes	No	III
Çapacıoğlu and Demirtaş (2017) [69]	High School 9th grade	N:30(15/15)	Creative Drama	Experiment 12 sessions Once a week 90 min	Quasi Experimental	STAXI	Trait Anger Experiment<control State Anger Experiment>control Anger Control Experiment<control Anger Out Experiment<control Anger In Experiment>control	No	No	III
Keçialan and Ocakçı (2018) [52]	Health Vocational High School 9th grade	N:65	CBT	8 sessions 1-2 a week 50 min	Quasi Experimental	CSES STAXI	CSES Pre-test<post-test STAXI Pre-test=post-test	No	No	III
Akdemir And Gündüz (2022) [53]	Vocational High School 10, 11th Grade	N:20 (9/11) Adolescent	CBT	Experiment 9 sessions Once a week 60 min	Quasi Experimental	DERS RPAS	DERS Pre-test>post test<follow up Experiment<control Reaktive Pre test>post test<follow-up Experiment<control Proaktive Pretest>posttest>follow up Experiment=control	Yes	Yes	III

STAXI: Trait anger-anger; Expression scales, RAS: Rathus assertivitness shedule, CSES: Communication skills evaluation scale, AS: Aggressiveness scale, PSS: Parental stress scale, FAD: Family assesment device, DERS: Difficulties in emotion regulation scale, RPAS: Reactive-proactive aggression scale, SPPR: Self Perception of Parental Scale.

Appendix 2. Master's theses

Study	Sample	N	Approaches	Number of sessions	Method	Scales	Results	Follow up	Effect size	Level of evidence
Çetinkaya (2013) [58]	Technical and Industrial Vocational High School 9-10th grade	N:147 (34/50/63)	CBT Rational Emotive Therapy	Experiment 8 sessions Once a week 40-50 min	Quasi Experimental	PSI MAS ISI	PSI-Trust, approach avoidance, personal control Experiment<control,2 MAS-Aggressive behaviors, passive aggressive reactions, revenge directed behaviors, Experimen t< control,2 MAS -Quiet Behaviors Experiment >control,2 MAS -Reckless Reactions Expeirment >control 2 ISI-Dominant, Avoider, Insensitive, Manipulative, Contemptuous, Anger Style, Experiment<control,2	Yes	No	III
Durmuş (2019) [68]	Faculty of Nursery	N:21 (11/10)	Psychodrama	Experiment 12 sessions Once a every two weeks	Quasi Experimental	STAXI	Trait Anger Experiment=Control Anger-Expression Experiment=Control	No	No	III
Diksaç (2020) [55]	E type Closed Prison 18-25 ages	N:18(8/10)	CBT	Experiment 8 sessions Once a week 70-90 min	Descriptive and RCT	BAQ STAXI CSS	BAQ Physical Agression Pre-test>post-test Control>experiment BAQ Hostility Pre-test>post-test BAQ Anger Pre-test<post-test Control >experiment BAQ Verbal Aggression Pre-test>post test Trait Anger Pre-test>post-test Control >experiment Anger Control Pre-test<post-test CSS Ego Developed Language Pre-test<post-test Experiment >control CSS Active Listening Pre-test<Post-test CSS Self-knowledge/Self Disclosure Pre-test<post-test Experiment >control CSS Empathy Pr-test<Post-test	No	No	II

Appendix 2. Cont.

Study	Sample	N	Approaches	Number of sessions	Method	Scales	Results	Follow up	Effect size	Level of evidence
Çelik (2021) [56]	High School 9 ve 10th Grade	N:35(19/16)	CBT	Experiment 6 sessions once a week 90 min	Quasi Experimental	SDQ STAXI CYRM-12	SDQ Pre-test=post-test Experiment=control CYRM-12 Pre-test=Post-test Experiment=Control Trait Anger Pre-test>Post-test Experiment=control Anger Expression Pre-test=Post-test Experiment=control	Yok	Yok	III
Aydil (2022) [61]	Anatolian High School 9-10-11th grade	N:21 (10/11)	Dialectic Behavioral Therapy	Experiment 8 sessions Once a week 45 min	Quasi Experimental	STAXI DERS DTS	Trait Anger Pre-test>post-test Experiment=control DERS Pre-test>post-test Experiment=control DTS Pre-test= Post- test Experiment=control	No	Yes	III
Şahin Vural (2023) [49]	High School 10-11th grade	N: 20 (10/10)	CBT	Experiment 7 sessions Once a week 60 min	RCT	STAXI	Trait Anger Pre-Test>Post- test=follow up Control>experiment Anger In Pre test>post-test<follow-up Control>experiment Anger Out Pre-test>Post-test=follow up Control>experiment Anger Control Pre test<Post- test=follow up Experiment>control	Yes	No	II
Gülcan (2023) [62]	Anatolian High School 9th grade	N: 52 (26/26)	Mindfulness	Experiment 6 sessions Once a week 40 min	RCT	STAXI	Trait Anger Experiment<control Pre-test >post-test Anger Out Experiment<control Pre-test>post-test Anger In Experiment<control Pre-test >post-test Anger Control Experiment>control Pre-test<post- test	No	No	II

PSI: Problem solving inventory, MAS: Multidimensional anger scale, ISI: Interpersonal style inventory, STAXI: Trait anger-anger; Expression scales; CSS: The communication skills scale, BAQ: Buss-perry aggression questionnaire, SDQ: The strength and difficulties questionnaire, CYRM: Child and youth resilience measure, DERS: Difficulties in emotion regulation scale, DTS: Distress tolerance scale.

Appendix 3. Doctoral dissertations

Study	Sample	N	School	Number of sessions	Method	Scales	Results	Follow up	Effect Size	Level of evidence
Kaya (2015) [54]	Department of Corrections 14-17 ages	N:65(32/33)	CBT	Experiment 30 sessions 2 a week 90 min	Quasi Experimental	STAXI AQ SPSI-SF	Trait Anger Pre-test>post-test Anger Control Pre-test<post-test Experiment>-Control AQ-physical Agression Pre-test>post-test AQ-Hostility Pre-test>post-test SPSI-SF Experiment>control	No	No	III
Anlı (2017) [57]	Anatolian High School 12th grade	N:23(11/12)	CBT	Experiment 10 sessions Once a week 60 min	RCT	SBS BFI	SBS Pre-test>post-test, follow up Post-test>follow up Control>experiment BFI-Interpersonal Sensitivity Pre-test>post-test, follow-up Control>experiment BFI Hostility, Anger Pre-test>post-test, follow up Control>experiment	Yes	Yes	II
Hoşrik Evren (2017) [63]	Children under state protection 14-18 ages	N: 90 (43/47)	Emotional Freedom technique from energy therapies (EFT) and Progressive Muscle relaxation technique used for cognitive behavioral stress management	For each group 2 sessions Once a week 120 min	Quasi Experimental	STAXI TAI FTS GISC	Anger Control Pre-test<post-test Group1=Group2 GISC-Fearful God Image Pre-test<post-test TAI Pre-test=post-test Group1=Group2 FTS Pre-test=Post-test Group1=Group2	No	No	III
Zorlu (2017) [59]	High School	N:30 (15/15)	Rational- Emotional Behavioral Therapy	Experiment 10 sessions Once a week 75 min	RCT	STAXI	Trait Anger Pre-est>post-test, Follow-up Experiment<Control, Follow up AngerOut PRe-test>Post-test, follow-up Experiment<control, follow-up Anger In Pre-test>post- test Experiment=control=follow-up Anger Control Pre-test<Post-test, follow-up Experiment>control	Yes	No	II

Appendix 3. Cont.

Study	Sample	N	School	Number of sessions	Method	Scales	Results	Follow up	Effect Size	Level of evidence
Ekitli Beycan (2019) [64]	Faculty of Nursery	N:38 (10/10/9/9)	Gross Emotion Regulation Model(1998) and CBT	Experiment 5 sessions Once a week 120 min	RCT	STAXI	Trait Anger Experiment <control1 Follow up Experiment <Control1 Anger Out Experiment <Control3 Anger In Control1>Control2 Anger Control Experiment >Control1-2-3 Follow-up Experiment >Control2	Var	Var	II
Akbaş (2021) [66]	Vocational and Technical Anatolian High School 10-11th grade	N:48(24/24)	Solution based Approach	Experiment 7 sessions Once a week 55 min	RCT	STAXI VTS	Trait Anger Experiment<control Pre-test>post-test, follow up Anger Out Experiment<control Pretest> post-test, follow up Anger In Experiment=control Pre-test>post-test, follow up Anger Control Experiment>control Pre-test<post-test, follow up VTS Experiment<control Pretest>post-test, follow up Post-test<follow up	Yes	No	II
Aktaş (2022) [50]	Faculty of Health Sciences 18-25 ages	N:121(59/62)	CBT	Experiment 6 sessions Once a week 90 min	RCT	STAXI	Trait Anger Pre-test>post-test, follow up Control>experiment Anger In Pre-test>post-test, follow up Experiment=control Anger Out Pre-test>post test, follow up Control>experiment Anger Control Pre-test<post-test, follow up Experiment<control	Yes	Yes	II
Genç (2022) [60]	Adolscents involved in crime 15-17 ages	N:24(12/12)	Acceptance and Commitment Therapy	Experiment 6 Sessions Once a week 120 min	Quasi Experimental	AAQ-II KA-Sİ ETS-CA-AF STAXI	AAQ-II Pretest>follow up2 Experiment<control KA-Sİ ETSCA-AF Pre-test=post-test=follow up1=follow up2 Experiment>control Trait Anger Pre-test> follow up1, follow up2 Experiment<control Anger Out Pre-test>follow up 1,2/ Follow up1<Follow up2 Experiment<control Anger Control Pre-test< follow up 1 Experiment>control	Yes	No	III

STAXI: Trait anger-anger; Expression scales, AQ: Aggression questionnaire, SPSI-SF: Social problem solving inventor-short form, BFI: Brief symptom Inventory, SBS: Submissive behaviors scale, TAI: Trait anxiety inventory, FTS: Forgiveness tendency scale; GISC: God image scale for children, VTS: Violence tendency scale, AAQ-II : Acceptance and action questionnaire-II, KA-Sİ-ETSCA-AF: Child and adolescent ka-si empathic tendency scale adolescent form.