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Sistemik Derleme / Systematic Review

## Level of Anger in Adolescents with Chronic Diseases and Associated Factors Systematic Review

Kronik Hastalıklı Ergenlerde Öfke Düzeyi ve İlişkili Faktörler: Sistemik Derleme

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### ABSTRACT

**Aim:** The objective of this study is to determine anger levels and anger expression style of adolescents with chronic diseases and variables that cause anger.

**Material and Method:** This is a systematic review based on a search on Turkish and English indexes between February-June 2021. For screening, databases were searched using the keywords "adolescent, chronic illness, anger, anger expression style, anger management, anger control, anger level, trait anger". During the data collection phase, full texts of 1788 articles were accessed.

**Results:** According to most of the studies examined within the scope of the research, it has been revealed that adolescents with chronic diseases have higher anger levels than healthy adolescents and that there are many factors that affect anger in adolescents with chronic diseases. Among these factors, age, school success and knowledge about treatment stand out. In addition, a relationship was found between anger and impulsivity, suicidal behavior, self-concept and resilience.

**Conclusion:** Adolescents with chronic illness have high anger levels. They have trouble in controlling and expressing their anger. It has been determined that variables such as mental illness, gender, school success and age affect anger status in adolescents.

**Keywords:** Adolescent, Anger, Chronic disease

### ÖZET

**Amaç:** Bu çalışmanın amacı kronik hastalığa sahip ergenlerin öfke düzeyinin, öfke ifade etme şekillerinin ve öfkeye neden olan değişkenlerinin belirlenmesidir.

**Gereç ve Yöntem:** Çalışma sistemik derleme niteliğindedir ve Şubat 2021-Haziran 2021 tarihleri arasında Türkçe ve İngilizce dizinler taranarak yapılmıştır. Tarama için "ergen, kronik hastalık, öfke, öfke ifade tarzı, öfke yönetimi, öfke kontrolü, öfke düzeyi, sürekli öfke" anahtar kelimeleri kullanılarak veri tabanları taranmıştır. Veri toplama aşamasında toplam 1788 makalenin tam metnine ulaşılmıştır.

**Bulgular:** Araştırma kapsamında incelenen çalışmaların bir çoğuna göre kronik hastalığa sahip ergenlerin sağlıklı ergenlere göre öfke düzeyinin yüksek olduğu ve kronik hastalıklı ergenlerde öfkeyi etkileyen birçok etkenin olduğu ortaya konmuştur. Bu etkenler arasında yaş, okul başarısı ve tedavisi hakkında bilgi sahibi olma öne çıkmaktadır. Ayrıca öfke ile dürtüsellik, intihar davranışı, benlik kavramı ve dayanıklılık arasında ilişki bulunmuştur.

**Sonuç:** Kronik hastalığı olan ergenler yüksek öfke düzeyine sahiptir. Öfkeyi kontrol ve ifade etmede zorluk yaşamaktadırlar. Ergenlerde öfke durumunu ruhsal hastalık, cinsiyet, okul başarısı ve yaş gibi değişkenlerin etkilediği belirlenmiştir.

**Anahtar Kelimeler:** Ergen, Öfke, Kronik Hastalık



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## INTRODUCTION

Anger is an emotion experienced when an individual is faced with an assault, criticism or barrier. Although this is a very natural, universal and human emotion, when not expressed properly it can be damaging for the individual and the individual's environment. People can become angry when they cannot get what they want, think that they are exposed to unfair treatment, when they lose friends, miss opportunities, face with fights, when they are frustrated, are not understood or respected (Stuart, 2013; Çelik Durmuş, Erdem & Gökçen, 2019). Feindler (2006) reported that anger can be expressed in a wide range of way from disappointment and frustration to rage and fury. Anger can be experienced in different level and also its direction can vary.

When anger is expressed towards other people, objects and the environment this is classified as "anger-out". Outward expression of anger /anger-out involves higher state anger and aggression. With outward expression of anger, people harm other people or objects, make heavy criticism or threat them. When anger is directed to self, to one's own body or is suppressed, it is classified as "anger-in". The psychoanalytical meaning of inward expression of anger is depression and feeling of guilt rather than anger. (Starnier & Peters, 2004; Özmen, Özmen, Çetinkaya & Akil 2016; Kiraz & Demirkıran, 2017; Çelik Durmuş et al., 2019; Yüksel & Yılmaz, 2019).

In adolescence which can be defined as a period of biological, psychological, mental and social development and maturing, people start to search for self, make decisions and choices for the future. Therefore, more anger can be felt in this period compared to all other stages of life. When a chronic disease is also present in addition to the challenges of this period, adolescents experience limitations, frequent medication use, doctor appointments and interference by their parents. This can affect their anger, its intensity and the way they express their anger (Çelik, Tahiroğlu & Avcı, 2008; Çam & Engin, 2014).

According to the Canada Pediatric Society (2007), 15% of youth in North America have a chronic condition that causes limitations in their lives. Approximately 10 to 20 million children have a chronic disease in the United States of America. Although the number of children who have a chronic condition is not known in Turkey,

according to the data of the Ministry of Health (2006) approximately one third of the population have a chronic disease (Chronic Diseases Report, 2006). The total population of Turkey is 85 million 372 thousand 377 as of 2024 (TUİK 2024). Considering that young people comprise 15.1% of the total population, it is clear that the number of adolescents affected by a chronic condition is substantial.

Adolescents with chronic diseases do not only try to mitigate symptoms of their diseases they also experience social, psychological, developmental problems due to various factors. At the same time, these adolescents try to live a normal life but due to some limitations and life style changes they often experience anger (Eser, Liman & Bilge, 2012; Wu, Chang, Tsai & Liang, 2018). Being an adolescent with a chronic disease makes anger management harder. Chronic diseases can cause changes in life styles, habits, emotions and personality of people suffering from these diseases and this can result in tension between them and the people in their social environment. This can be damaging both for the person, the disease process and the person's family and friends (Eser et. al., 2012; Ambler, Eidels & Gregory, 2015; Wu et al., 2018; Özyurt et al., 2021). It is important to assess anger levels to address and treat adolescents with chronic diseases.

Literature review shows that there are many descriptive and interventional studies on anger in adolescence. Again in the literature, there are also studies which attempted to determine anger levels and expression methods of anger of adolescents with chronic diseases (Eser et. al., 2012; Ambler et. al., 2015; Wu et al., 2018; Özyurt et al., 2021). The objective of this study is to determine anger levels and anger expression style of adolescents with chronic diseases and variables that cause anger and to help to take necessary measures to prevent adolescents and the communities they live from experiencing adverse circumstances caused anger. This systematic review assessed the studies which examined anger levels, expression of anger styles of adolescents with chronic diseases and anger associated factors with a different perspective.

### Research Questions

The main question intended to be answered in this systematic review is:

1. What are the anger levels of adolescents

- with chronic diseases?
2. What are the anger expression styles of adolescents with chronic diseases?
  3. What are the factors associated with anger in adolescents with chronic diseases?

## MATERIAL AND METHODS

### Research Type

The study was designed as a systematic review. In line with the objective of this systematic review, search was done in PubMed, Google Scholar, Türkiye Klinikleri, Dergipark, Ulakbim, Clinical Key, Cochrane, EbscoHost, Web of Science and Science Direct databases. The following keywords in Turkish and English were used for the search in the databases “ergen, kronik hastalık, öfke, öfke ifade tarzı, öfke yönetimi, öfke kontrolü, öfke düzeyi, sürekli öfke”, “adolescent, chronic disease, anger, anger expression styles, anger management, anger control, anger level, trait anger”.

Other studies mentioned in the references section of the studies included in this systematic review were also assessed and data collection was done between February and June 2021.

Five researchers worked independently to identify and select the studies to be included in the systematic review, and any disagreement was discussed to reach a consensus. Only studies on adolescents were included in this systematic review and studies that examined adults and adolescents or adolescents and children together were excluded.

The PRISMA checklist was used in the preparation and reporting of the systematic review.

### Study Population and Sample

#### Evaluation of methodological quality of the studies

Methodological quality of the articles included in this systematic review was assessed and controlled by each researcher. The STROBE Checklist with 22 items was used to evaluate the quality of the articles included in the systematic review. The studies were evaluated using 22 items and the mean score of the studies was  $17.5 \pm 2.20$  (range 15-21).

#### Eligibility criteria for the studies to be included in this systematic review are listed below (PICOS):

**Patient:** Adolescents with chronic diseases

**Intervention:** No intervention

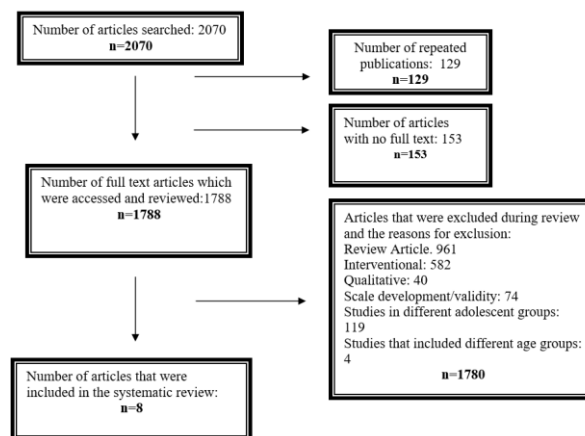
**Comparison:** Comparison of anger and anger expression styles of adolescents with chronic diseases.

**Outcomes:** Anger characteristics of adolescents with chronic diseases

**Study Design:** Descriptive, cross-sectional, observational

#### Characteristics of Included Studies

All cross-sectional, domestic and foreign studies (Published in Turkish and English) which included adolescents with chronic diseases and examined their anger levels and anger expression styles. Interventional and methodological studies and traditional reviews were not included in this systematic review. Additionally, studies whose full texts could not be accessed and whose language was not Turkish or English were excluded from the scope of the research. No systematic review or meta-analysis on this subject was found in the literature. Eight of 1788 studies which were found using the above mentioned keywords were eligible for systematic review. A total of eight domestic and foreign studies which were conducted and published between 2000 and 2021 were included in this systematic review. The flow diagram of the systematic review is shown in Figure 1.



**Figure 1. Selection process of the articles included in the systematic review** (Prisma Flow Chart, Moher et. al., 2009).

#### Main Measurement Tools Used in The Studies

**Personal Information Form:** Various questionnaire forms about personality traits of

participants were used by researchers.

**Trait Anger and Anger Expression Scale (TAAES):** The scale was developed by Spielberger et al. to measure experience, expression and control of anger between 1980-1983 and Turkish version was developed and the validity and reliability of the Turkish version was done by Özer in 1994. The scale consists of 34 items and 4 sub-scales (Trait Anger, Anger-Expression-Out, Anger-Expression-In, Anger-Control). High scores on trait anger indicate that the level of anger is high; high scores on the anger-in scale indicate that anger is suppressed and kept in; high scores on the anger-out scale indicate that anger is easily expressed, and high scores on the anger-control scale indicate that anger can be controlled.

**Multi-dimensional Anger Scale (MAS):** This scale was developed by Balkaya and Şahin in 2003 to measure anger together with its dimensions and identify emotions, thoughts, expression and coping styles with anger and reliability and validity studies were done. The scale consists of 158 items and 5 dimensions. The Likert-type scale is scored between 1 and 5. The higher the score from the scale, the more that dimension is used or considered.

**Chinese Beck Anger Inventory:** This inventory is typically used to assess the feelings of anger and hate in adolescents as a standard measure for perception of aggressiveness from others and physiological over-stimulation, hostility from others and feeling unjust treatment by others. The inventory is a 4 point Likert type scale which consists of 20 items. A score of 55 and lower indicates an average score; a score between 55-59 indicates a slightly higher anger, a score between 60-69 indicates high level of anger and over 70 indicates extremely high level of anger.

**Adolescent Anger Rating Scale (AARS):** The scale was developed by DeAnna McKinnie Burney in the USA in 2000. Validity and reliability study of the Turkish version was done by Aslan and Sevinçler-Togan in 2005. It is a 4-point Likert-type scale consisting of 41 items. The scale measures Reactive Anger, Instrumental Anger, Anger Control and Total Anger scores of adolescents.

**Buss-Perry Aggression Questionnaire (BP-AQ):**

The scale was developed by Buss and Perry in 1992. This 5 point Likert type scale which measures physical aggression, verbal aggression,

anger, indirect aggression and hostility consists of 34 items. The highest score that can be obtained from the scale is 170, the lowest score is 34. If the total aggression scale score is high, it is recommended that the individual's subscale scores be examined.

**State Trait Anger Expression Inventory (STAXI):** The Turkish version of the inventory which was developed by Spielberger et al was developed by Özer in 1994. This inventory is used to assess anger expression patterns among students. Anger expression patterns are anger suppression (8 items), anger expression (8 items), and anger control (8 items). STAXI is a 4 point Likert scale (0-3) which consists of 24 questions. The score range for each category is between 0 to 24 and higher scores refer to higher level of anger. The inventory has two sub-scales; state anger and trait anger.

### Ethical Considerations

The research data has been obtained from the literature and there is no risk of material/moral damage to the researchers. However, all the articles included in the study are shown in the bibliography.

The research protocol was registered in the "PROSPERO" database with the registration number "CRD42022311693".

### RESULTS

Interventional studies, methodological studies, traditional reviews, systematic reviews and meta-analyses were excluded from this systematic review. Cross-sectional studies (case-control, analytical, descriptive, observational) that examined anger level of adolescents with chronic diseases with full texts accessed were included in the systematic review. Eight out of 2070 articles that detected were found eligible for the review. In the studies included in the systematic review, adolescents with physical diseases such as gastric, nephrological disorders, endocrinological, immunological disorders, cardiovascular diseases, respiratory diseases, hematological disorders, diabetes, leukaemia, chronic kidney failure, cancer and asthma as well as adolescents with psychological disorders such as borderline personality disorder (BPD), major depression (MD), attention-deficit/hyperactivity disorder (ADHD), conduct disorder (CD), oppositional defiant disorder (ODD), autism spectrum disorders were examined.



**Table 1. Information about The Studies Included in The Systematic Review**

First Author, (yr)	Study design	Data Collection Tools	Country	Year	Baseline disease reported	Sample Size (Gender)	Mean Age (yr old)	Relevant Findings
<b>1. Horesh, Orbach, Gothelf, Efrati &amp; Apter, 2003</b>	-	1. Beck Depression Inventory 2. Beck Hopelessness Scale <b>3. Multi-dimensional Anger Scale (MAS):</b> 4. Open Aggressiveness Scale 5. Impulse Control Scale 6. Suicide intent scale	Israel	-	BPD and MD	65 (50 female, 15 male)	15.0 ± 2.30	Anger and aggression level of BPD group was higher than MD group (77.7 ± 14.9). Aggression was observed more in the group that was not suicidal. A significant positive relationship was found between anger and impulsivity and suicidal behaviour.
<b>2. Harty, Miller, Newcorn &amp; Halperin, 2009</b>	Longitudinal Investigation	For children 1. Wechsler Intelligence Scale for Children Revised 2. The Child Behaviour Checklist 3. IOWA Connors Teacher questionnaire 4. Diagnostic Interview Schedule for Children For adolescents. <b>5. Buss-Perry Aggression Questionnaire (AQ)</b> <b>6. State-Trait Anger Expression Inventory (STAXI-2)</b> 7. ADHD Symptom Checklist	Unspecified	1990-1999/2000	ADHD and CD or ODD	169 Case: 85 adolescents with ADHD (10 female, 75 male) Control: 83 adolescents with no ADHD (10 female, 73 male)	18.23 ± 1.36	Levels of anger, trait anger, angry temperament, anger expression (out) and anger control (out) of adolescents with ADHD+CD and ADHD+ODD were higher than the adolescents in the control group.
<b>3. Bodur, İnfal &amp; Kurt, 2010</b>	Descriptive	1. Demographic Information Form <b>2. Trait Anger-Anger Expression Scale</b>	Turkey	2008	Diabetes leukaemia, chronic kidney failure	68 (30 female, 38 male)	-	The mean score for trait anger of adolescents was 23.1 ± 7.2; the mean score for anger-in was 15.9 ± 5.1; the mean score for anger-out was 17.0 ± 5.8; and the mean score for anger control was 19.6 ± 5.9. Adolescents with high success in school had lower mean trait anger, mean anger-in and anger-out scores and adolescents who thought that they did not have enough information about their treatment had lower anger control scores.
<b>4. Eser &amp; Üstün, 2011</b>	Descriptive	1. Demographic Information Form <b>2. Trait Anger/Anger Expression Scale</b>	Turkey	2010	Mental Disorder	50 (33 female, 17 male) and 100 parents	17.00 ± 1.20	Trait anger, anger out and anger control scores of the adolescents with mental disorders were higher than their parents (mother+father, mother, father).

**Table 1. Information about The Studies Included in The Systematic Review (Table 1. Continued)**

<b>5. Eser et. al., 2012</b>	Descriptive	1. Personal Information Form, 2. <b>State Trait Anger Expression Inventory (STAXI):</b>	Turkey	2012	Chronic disease (gastric, nephrological, endocrinologica l, immunological, cardiovascular, respiratory and hematological)	64 (32 female, 32 male)	14.78 ± 2.16	Anger level scores of adolescents was 4.68 ± 2.73 (on a scale of 0-10) and anger control scores were high(21.68 ± 4.88). Adolescents with immunological disorders had trait anger scores were higher and anger control scores were lower from those with other diseases. Adolescents in the age group of 16-18 had higher trait anger and anger-out scores.
<b>6. Ambler et. al., 2015</b>	Case Control	1. Revised Children's Manifest Anxiety Scale, Second Edition- (RCMAS) 2. <b>Adolescent Anger Rating Scale-AARS</b> 3. Student Behaviour Questionnaire (Teacher Report)	Australia	2014-2015	Autism spectrum disorders	104 Case:52 (10 female, 42 male) Control: 52 (10 female, 42 male)	ASD group: 14.50 ± 1.77 The control group: 14.35 ± 1.68	There was no significant difference between the group for autism spectrum disorder and the control group in anger control and the anger control levels of the control group did not affect physical aggression. For the autism spectrum disorder group, high levels of self-reported anger control skills were associated with low levels of physical aggression.
<b>7. Wu et. al., 2018</b>	Descriptive, cross-sectional	1. Chinese Beck Self-Concept Inventory 2. <b>The Chinese Beck Anger Inventory</b> 3. The Chinese Resilience Scale	Taiwan	2014	Cancer	40 (17 female, 33 male)	14.88± 2.26	The mean score in the Beck Anger Inventory was 43.9 ± 10.0. Anger levels of male adolescents between the ages of 10-12 were higher. There was a negative relationship between anger and self concept and resilience of adolescents. The study found that anger variable for adolescents acted as a mediator for self-concept and resilience change and self-concepts of adolescents with cancer acted as a mediator for the effect of anger on resilience.
<b>8. Özyurt et. al., 2021</b>	Cross-sectional	1. Multi-dimensional Peer Victimization Scale (MPVS) 2. <b>State Trait Anger Expression Inventory (STAXI)</b> 3. Strengths and Difficulties Questionnaire (SDQ) 4. Personal data form	Turkey	2017-2018	Asthma	121 Case:61 (32 female, 29 male) Control: 60 (31 female, 29 male)	Asthma Group: 14.27 ± 1.37 Control group: 14.38 ± 1.12	Anger expression and anger suppression was reported less in adolescents with asthma than healthy adolescents.

Three studies included in the systematic review reported that there were differences in anger expression styles of adolescents with chronic diseases compared to comparison groups (n=294). Furthermore two articles reported that anger level (n=233), and three articles reported that trait anger level (n=282) was higher. Nevertheless, there are studies which showed that anger expression scores were high in adolescents with ADHD (n=168), low in adolescents with asthma (121); adolescents with mental disorders had high anger-in scores (n=150); and adolescents with asthma had low anger suppression scores (n=121) (Table 2).

According to the studies included in the systematic review; adolescents with borderline personality disorder had higher anger levels compared to the

adolescents with major depressive disorder (n=65), and adolescents with immunological disorders had high anger levels and low anger control levels compared to the adolescents with other chronic diseases (n=64). In terms of age variable, adolescents in the age groups of 10-12 (n=40) and 16-18 (n=68) had higher level of anger than other age groups. A study that examined gender variable found that male adolescents (n=40) had higher anger levels. Adolescents with high success in school (n=68) had lower mean trait anger, anger-in and anger-out scores and adolescents who did not have enough information about their treatment (n=68) had lower anger control scores. Additionally, as anger increases, self-concept and resilience level decreases (n=40) and suicidal behaviour increases (n=65) (Table 3).

**Table 2. Anger Levels of Adolescents With Chronic Diseases and Sub-Dimension Characteristics**

Anger and Sub-Dimension Characteristics	Study No	Sample size
Anger	1,2	233
Trait anger	2,4,5	282
Angry temperament	2	168
Anger expression	2(high), 8(low)	168-121
Anger control	2,5	232
Anger-in	4.8 (low suppression)	150-121
Anger-out	4	150
Instrumental anger	6	104
Reactive anger	6	104

**Table 3. Anger Characteristics of Adolescents with Chronic Diseases**

Anger Characteristics	Study No	Sample size
Anger level is higher in adolescents with BPD (than MDD)	1	65
Trait anger levels of adolescents with immunological disorders are high, anger control levels are low	5	64
Adolescents in the age group of 16-18 have higher trait anger and anger-out scores.	5	68
Anger levels of male adolescents between the ages of 10-12 are higher.	7	40
Adolescents who do not have enough information about their treatment have lower anger control scores.	3	68
Adolescents with high success in school have lower mean trait anger, anger-in and anger-out scores	3	68
Negative relationship between anger and self concept and resilience of adolescents.	7	40
High suicidal behaviour	1	65

## DISCUSSION

Three studies included in the systematic review reported that there were differences in anger expression styles of adolescents with chronic

diseases compared to comparison groups, two studies reported higher anger levels and three studies reported higher trait anger levels. Nevertheless, it was shown that anger expression scores were high in adolescents with ADHD, and

low in adolescents with asthma; adolescents with mental disorders had high anger-in scores; and adolescents with asthma had low anger suppression scores. In their non-clinical study in university students, Whiteside & Abramowitz (2004) reported that students who had obsessive compulsive symptoms experienced more anger and tended to suppress anger more and had more difficulty in controlling anger. In their study aiming to evaluate covert aggression in patients with Obsessive Compulsive Disorder (OCD), Moritz et al. (2011) found that OCD patients had higher covert aggression scores compared to the healthy control group. In another study, it was reported that patients who were diagnosed with OCD tended to suppress or internalize their anger more than healthy individuals (Moscovitch, McCabe, Antony, Rocca & Swinson, 2008). Ölmez (2020) reported that individuals with a OCD diagnosis tended to suppress anger more than those who did not have any mental disorder diagnosis. In their study, Iliceto et. al. (2012) found that obese women had higher anger-in levels. Similarly, Tsenkova et al. (2014) found that as the body mass index increased, anger-in level increased. In their study in people who are 18 years and older Atan & Yılmaz (2015) concluded that patients with essential hypertension had higher mean trait anger scores. The study of Butekin (2017) found that trait anger levels of patients with diabetes and the study of Soyaslan & Özcan (2019) found that people who had substance abuse problem had higher anger, anger-in and anger-out levels. It can be said that the results of this research, which presents the results of studies conducted on adolescents, are similar to the studies conducted on individuals with chronic diseases in the national and international literature. Higher levels of anger in adolescents with chronic diseases can be due to the reason that they have a difficulty in controlling their anger, and inward expression of anger can be explained with the negative feelings caused by chronic diseases.

According to the studies included in the systematic review; adolescents with borderline personality disorder have higher anger levels compared to the adolescents with major depressive disorder and adolescents with immunological disorders have high anger levels and low anger control levels compared to the adolescents with other chronic diseases. In their study Cackowski et. al. (2017) reported that people with borderline personality disorder had higher level of aggression and hostility and were more inclined to show their

anger compared to those with attention deficit and hyperactivity disorder. According to these results, it can be concluded that some personality disorders increase level of anger in people. No study which shows anger levels of people with immunological disorders was found. However it is not surprising that allergies trigger anger and are hard to control.

In terms of age variable, adolescents in the age groups of 10-12 and 16-18 had higher level of anger than other age groups. In their study Özyürek & Demiray (2010) found that adolescents who are 18 and older had significantly higher levels of trait anger compared to 16 and 17 years old adolescents. In their study, Temel & Nas (2018) found that anger control scores of 9th grade students were higher than the scores of 11th grade students. Yüce (2019) reported no statistical significant difference between anger sub-dimensions based on the age variable. Some studies reported that with increasing age, there was a significant increase in mean trait anger and anger-out scores of adolescents (Alkış, 2017; Kesen et. al., 2007). In their study in adolescents Kiraz & Demirkıran (2016) found a positive correlation between the ages of students and their anger-in and anger-out levels. Some studies on this subject also found that the age variable did not have a significant effect on trait anger, and anger expression styles of adolescents (Elkin & Karadağlı 2016; Uslu, 2015; Uzunoğlu, 2017). Based on our systematic review results and literature findings there is a significant relationship between age and anger however the effect of adolescence on young people and increased anger level with adolescence should not be ignored. In addition, it is thought that the difference in the age of onset of puberty may have an impact on this situation.

A study included in our systematic review, which examined gender variable found that male adolescents had higher anger levels. In their study Özmen et al. (2016) reported that male adolescents had higher anger levels and directed their anger outward more. According to the study of Anjanappa et. al. (2019), male adolescents experienced anger more than female adolescents. Uslu (2015), Durar (2017), Yüce (2019) also achieved similar results in their studies. Based on our systematic review results and literature findings men tend to express their anger outward more while women tend to express their anger inward. The reason for this can be the gender roles attributed to men and women in the society.

Adolescents with high success in school had lower



mean trait anger, anger-in and anger-out scores and adolescents who did not have enough information about their treatment had lower anger control scores in our systematic review. Çelik (2019) found that students who did not do well in school had higher level of anger-in compared to other students. In their study in elementary school students Bacioğlu & Özdemir (2012) found that success in school and anger control had a negative correlation. Literature findings concerning success are similar to the findings of this study. Higher success levels in school promote well-being of students whereas failure triggers anger emotions and make it harder to control anger. Our literature systematic review discovered findings which show that as anger increases, self-concept and resilience level decreases and suicidal behaviour increases. In the literature, there are studies which indicate that anger is a predictor of suicidal behaviour (Park et al., 2010; Reyes et al., 2015; McKinney Hirsch & Britton, 2017; Cenksever Önder & Bölükbaşı, 2019). In their study which examined the three variable of self-respect, anger and suicidal thoughts together in adolescents and adults, Jang et al. (2014) concluded that self-respect and anger were predictors of suicidal thoughts. Our study findings and literature findings demonstrate that anger that cannot be controlled leads to other negative emotions and states.

### Limitations

This systematic review is limited to descriptive, cross-sectional and observational research articles written in Turkish and English and whose full texts are available.

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### CONCLUSION

This systematic review concludes that adolescents with chronic diseases have higher level of anger and experience difficulty in controlling and expressing their anger. Additionally, our systematic review uncover several variables that affect anger in adolescents. Major variables include mental disorders, gender, school success and age. Although these results are not common in all studies, they are notable. In addition, due to the number of samples and the type of research, all results cannot be generalized to all adolescents.

Based on these findings, addressing variables that pose an anger risk in adolescents with chronic diseases and prioritizing and assessing those who are especially in risk groups and developing solutions to reduce anger can be recommended. In

this context, it will be very important to carry out interventional studies.

### Author Contributions

Idea/Concept –F.A., D.Y.; Design: F.A., D.Y.; Supervision/Consulting: F.A., D.Y.; Analysis and/or Interpretation: F.A., D.Y., F.D.; Literature Search: D.Y., E.M., Ş.Ö., Z.T.G.; Writing the Article: F.A., F.D., D.Y., E.M., Ş.Ö., Z.T.G.; Critical Review: F.A., F.D.

### Peer-review

Externally peer-reviewed.

### Conflict of Interest

The authors have no conflict of interest to declare.

### Financial Disclosure

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