

Attributional Styles in Adolescents with Transfusion-dependent Thalassemia

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Abstract: This study focused on the way that Adolescents with Transfusion-dependent thalassemia explained negative or positive events in their life (Attributional Styles). It is defined by three dimensions describing the cognitive appraisal of the events: internal-external, stable-unstable, and global-specific. With cross-sectional research design, the observations consist of 102 adolescents (48 males, 54 females) who diagnosed with Transfusion-dependent thalassemia (more than 50 times for blood transfusions) completed the measure of Attributional Styles and Anxiety Questionnaires. The correlations in the predicted directions among variables examine with Pearson product-moment correlation coefficients, *t*-test, and One-way ANOVA to ascertain a significant between the group differences on attributional factors and levels of anxiety symptoms. The results show that Adolescent samples with higher levels of anxiety revealed statistically significant relationship among three negative attributional dimensions (overall composite $F = 4.5$, $p < 0.05$; negative composite $F = 4.99$, $p < 0.01$; negative-externality $F = 4.99$, $p < 0.01$; negative-stability $F = 3.42$, $p < 0.05$ and negative-globality $F = 3.77$, $p < 0.05$). In addition, significant age- group differences were found for the total negative-globality ($t = 2.05$, $p < 0.05$) and negative- globality ($t = -2.22$, $p < 0.05$). These data are consistent with the reformulated learned helplessness model of depression. In finding, the individuals who attribute negative life events to internal, stable, and global causes will be more vulnerable to anxiety than those who make external, unstable, and specific attributions. Most interestingly, those adolescents more than 17 years evidence more negative-globality attributional style than group less than 16 years, and female adolescents may influence this pattern. These results suggest that targeting Adolescents with Transfusion-dependent thalassemia may be important for improving aspect of coping on psychological adjustment to their chronic illness.

Key words: Attributional styles, anxiety, adolescents with transfusion-dependent thalassemia.

1. Introduction

Thalassemia is a red blood cell disorder that belongs to an inherited autosomal recessive gene. They have two abnormal genes at the same position locus for thalassemia patients but for thalassemia carriers which they carry one normal gene and one thalassemia gene. Therefore, the heterozygous mutation does not exhibit any of the symptoms. Being a thalassemia disease where both parents carry thalassemia genes that interaction is leading to absence or reduction of hemoglobin synthesis. Thailand has more than 20 million thalassemia carriers or 1% of the most population, and it estimates that there are 630,000

people with thalassemias or similar hemoglobinopathies for 63 million of the total population. More than 19,000 children are born with any thalassemia and nearly 4,253 with TMA (thalassemia major) of the 800,000 children born annually. For instance, patients with thalassemia major are the necessary lifelong transfusion dependent due to an absence or reduction of hemoglobin (protein) synthesis in red blood cell which carries oxygen from the lung to other organs and keeps carbon dioxide to the lung. Along with pathology of red blood cell in patients with thalassemia disease such as lack of flexibility, fast destroy by spleen that needs regularly and much volume of blood transfusion as enough to inhibit suppression of erythropoiesis, resulting in donor'

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red blood cell in their blood circulation, decrease spleen and chronic anemia, no physical deformity, including the protection of any clinical complications. [1]

The medical science reasons of an inherited blood disorder and chronic illness have implications affecting these patients and their families as well as affecting other psychosocial problems. Because they have been completely abstract thinking by this age (Adolescents) and are able to think of death such as delay or failure to enter puberty, infections, acquired through blood transfusions, diverse clinical complication. Moreover, they need to get a sufficiency of blood transfusions every 4 to 6 weeks for life, requiring time off from school, iron chelation from transfusion required injection of a drug such as a deferral, using battery pump more than 8 hours a day, at least five nights a week. As with the management of the disease, complications affected adolescents are vulnerable to psychological problems or difficult social. In particular, the decreasing of identity but increasing of alienation sometimes over protecting families were not traditional roles of adolescents in society, work, and family life. Thus, many adolescents have not revealed their illness and any anxieties because of their great feeling of stronger [2].

Attributional Style Association with Anxiety in Adolescents

How the adolescents with chronic illness try to understand why the illness happened to them, that is, how they explain or attribute about life events in which was predicted how they would explain similar incidents in the future. The attributional style is conceptualized model from the reformulated learned helplessness theory of depression [3-5] along with three dimensions: internal-external, stable-unstable, and global-specific. The internal-external dimensions refer to whether explanation related to physical, behavioral, cognitive idea of the self (i.e., inner) or it is an outcome from someone or something outside themselves. The stable-unstable dimensions refer to

whether the cause of events has been consistent overtimes or (i.e., stable all the times) or sometimes, occasionally (i.e., unstable). The global-specific dimensions refer to whether the events bring about generalized around themselves (i.e., global) or has more limited affected only of the individual's life (i.e., specific). The purpose of the attributional model is important to understanding adolescents' cognitive risk for anxiety. Indeed, this theoretical approach to understanding children's development such as academic performance, peer relationships, and physical health. In the most previous research use of these dimensions is to understand depression or anxiety [6-8]. Other studies, however, have been examined the relation between self-reported depressive or anxiety symptoms and the negative attributional style of internality, stability, and globality empirically. Because these results suggest that elevated level of anxiety effect in individual (negative life events) linked to increasing the dimension of internality, stability, and globality that developed for psychological problems.

Attributional style was the way that person is likely to explain the causes of positive and adverse life events, regarding the cognitive process involved in anxiety. Specifically, research reveals that youth who describe negative life events (e.g., illness) with internal, stable, and global attributions and explain positive events (e.g., good grade) with external, unstable and specific attributions are prone to depressive symptoms. Conversely, the youth who reveal an optimistic attributional style for negative life by using external, unstable and specific attributions and using internal, stable, and global attributions for positive events, do not risk for depression or anxiety [3, 9]. Several recent studies had focused on issues the pessimistic attributional style associated with depression or anxiety in youth, such as two of cross-sectional studies, each of which found that depressive attributional style and depressive symptoms significantly associate in these groups [7, 8]. Moreover, others studies also reveal that attributions and anxiety are associated [9, 10]. Thus,

the attributions categories evidence that attribution theoretical frameworks have also proposed for understanding how youth explain the positive and negative events in their lives. However, something that anyone can see still has been hidden and or else interesting questions such as why some adolescents with transfusion-dependent thalassemia tend to hold themselves an elevated level of positive attributions from those who have a pessimistic attributional style. Moreover, it was not enough by the only medical reasons to explain entirely cognitive process variations.

Thus, the purpose of this present investigation is to examine in youth for whom have been diagnosed with thalassemia syndromes as the relations between theoretical perspectives of attributional style, and anxiety, duration of disease, age, gender, with the hypothesis predicted that positive attributional style is associated with decreased levels of the anxiety. At the same time, age differences would associate with the negative attributional style. Specifically, it was expected to get useful data for medical providers and also supported whether the ability or development in the youth is with transfusion-dependent thalassemia.

2. Method and Measures

2.1 Method

This explanatory research of cross-sectional design was to evaluate the dimensions structure of thalassemia adolescents and examine the relationship between attributional style, anxiety, and gender, age and disease parameters such as the age of onset, duration of disease. The observations are from participants who diagnosed with severe thalassemia from Hemato & Oncology, Pediatrics Department, the Faculty of Medicine Siriraj Hospital, and get regular blood transfusion 2 to 6 weeks (more than 50 times). The demographic characteristics of the sample were as follow: mean age was 17.1 years ($SD = 2.7$), 54 (52.9 %) were females, 30.4% were in secondary school, 26.5% were in high school, 26.5% higher than high school, 28.4% were living with separated, divorced or widowed parents,

71.6% were living with both biological parents, 77.5% were type of β -thalassemia/hemoglobin E, mean of time to get blood transfusions 11.8 years ($SD = 4.7$), 66.7% were UC (universal coverage) health payment, 27.5% Government Welfare health payment and 5.9% were out of pockets health payment.

2.2 Measures

Three structured interview questionnaires are used in this study: The Questionnaires of the demographic characteristic of the sample were as examples: gender, age, race, time since diagnosis, duration of disease, the age of onset, transfusions requirement per month.

CASQ (children's attributional style questionnaires). This CASQ is utilized by researchers with reviewed relational literature as the framework of Seligman [11]. The model of CASQ is 48 forced-choice items, consisting of situations (e.g., You get an "A" on a test). Moreover, two possible explanations (e.g., I am smart vs. I am smart on that subject). Half of the situations present positive outcomes; half are negative results. Thus, there are six scales in the CASQ: the internality, stability, and globality scales for bad events, and the internality, stability, and globality scales for good events. Subscale, positive composite, and negative composite scores can be derived. The lower of positive composite and subscales scores and the higher of the negative composite and subscale scores, the more anxiety the attributional style. Overall subscale scores obtained by subtracting the subscale score for the negative events from the subscale score for the positive events; the lower this subscale composite score is, the more anxiety the attributional style is. An Overall composite score is obtained by subtracting the composite score for the negative events from the composite score for the positive events. The lower this overall composite score is, the more anxiety the attributional style is. For examining the psychometric properties of the current sample, internal consistency reliability has been found to be 0.48, 0.59, 0.56 for positive events, negative events, and overall composite

respectively. For the previous study, CASQ test-retest reliabilities across one year reported being 0.48 for positive events, 0.54 for negative events [12] and 0.56 for the overall composite.

RVCAS (revised version of children's anxiety scale), the items was designed from a review literature [13, 14] clinical psychologist who specialize in anxiety disorders, child anxiety assessment measures, and the *DSM-IV* [15] with each of 6 diagnostic categories, SAD (separation anxiety disorder), GAD (generalized anxiety disorder), Social phobia (SP), OCD (obsessive/compulsive problems), PDA (panic disorder with agoraphobia), and fear of physical injury.

The 32 items of questionnaires are allocated to each of the *DSM-IV* diagnostic categories. Adolescents are asked to rate on 4 point scales involving: never (0), sometimes (1), often (2), and always (3), the frequency with which they experience each symptom and high scores reflecting greater anxiety symptoms. For each the samples in this study, A Cronbach's alpha reliability coefficient was 0.86.

3. Results

Examination of RVCAS and CASQ scale distributions show that the scores normally distributed, and there is no deviation from normality (i.e. skewness,

kurtosis). Furthermore, no statistically meaningful correlations found between CASQ scores and demographic variables (i.e. gender, age, education), and therefore no statistical adjustments need to be done based on demographic data.

3.1 Attributions and Anxiety in Adolescents on Transfusion-Dependent Thalassemia

In the current samples, Pearson product-moment correlation coefficients revealed that elevated anxiety symptom scales were significantly correlated with each attributional score at or beyond the $p < 0.05$, specifically, negative composite ($r = 0.20$), and overall composite ($r = -0.21$). Also, significant correlation in the predicted way were found for Total-internality, Positive-stability and Total-stability, $r = -0.20$, $r = -0.21$, $r = -0.25$, respectively. However, there is no significant correlation between anxiety symptoms and Positive or Negative-Globality.

To determine if there was a relationship between attributional scores on the anxiety measures, One-way ANOVA (*F-test*) was performed with three level scores of anxieties (mean = 33, median = 32, SD = 14.8), score 6-26 to mild, 27-41= moderate and 42-66 to high anxiety, respectively. Table 1 presents the mean and standard deviations for Adolescent Attributional Style

Table 1 Group Means and Standard Deviations for Adolescent Attributional Style Questionnaires Scores for Three Anxiety Groups.

Attributional dimensions	Anxiety Group					
	low (n = 32)		moderate (n = 38)		high (n = 32)	
	M	SD	M	SD	M	SD
Positive Composite	97.87	12.48	96.42	10.92	94.38	13.17
Negative Composite	60.97	20.41	58.24 ^b	16.22	71.72 ^b	19.06
Overall Composite	36.91 ^a	23.70	38.18 ^a	22.42	22.66 ^{ab}	24.16
Positive-Internality	33.19	5.32	32.05	4.96	32.06	5.51
Negative-Internality	21.91	7.26	20.45 ^b	5.54	25.22 ^b	6.37
Total-Internality	11.28	7.40	11.61 ^a	8.46	6.84 ^a	8.70
Positive-Stability	34.59	4.05	33.97	3.84	32.16	4.93
Negative-Stability	17.75	7.12	17.03 ^a	5.44	21.06 ^a	7.67
Total-Stability	16.84 ^a	8.50	16.95 ^a	8.08	11.09 ^a	8.75
Positive-Globality	30.09	5.56	30.39	5.13	30.16	5.38
Negative-Globality	21.31	7.90	20.76 ^a	7.08	25.44 ^a	7.85
Total-Globality	8.78	10.82	9.63	9.18	4.72	9.67

Means with different superscripts differ significantly in the Tukey HSD; *post hoc* test: ^a $p < 0.05$, ^b $p < 0.01$.

Questionnaires scores in each Anxiety groups, that is the higher level of Attributional scores found among adolescents who tend to moderate and high anxiety.

Specifically, on the high scores anxiety group evidenced a more pessimistic attributional style than moderate and mild anxiety groups and on the negative-internality: mean = 21.9 ($SD = 7.26$), 20.45 ($SD = 5.54$), 25.22 ($SD = 6.37$), on the negative-stability: mean = 17.75 ($SD = 7.12$), 17.03 ($SD = 5.44$), 21.06 ($SD = 7.67$), and on the negative-globality: mean = 21.31 ($SD = 7.90$), 20.76 ($SD = 7.08$), 25.44 ($SD = 7.85$), for each group of low, moderate and high scores of anxiety, respectively.

When attributional scores were classified by anxiety groups, a series of Tukey post hoc comparisons indicated significant between group differences for the following attributional scores: Overall-Composite $F = 4.51, p < 0.05$; Negative-composite $F = 4.99, p < 0.01$; Negative-Internality $F = 4.99, p < 0.01$; Negative-Stability $F = 3.42, p < 0.05$; Negative-Globality $F = 3.78, p < 0.05$.

That is adolescents on Transfusion-dependent thalassemia with the higher level of anxiety symptoms found among youths who tend to attribute negative events to elevate internal, stable, global dimensions and attribute positive events to promote external, unstable, and specific dimensions.

Additionally, the positive and each positive composite indicate that higher mean found among adolescents in low anxiety groups such as Positive Composite, mean = 97.87 ($SD = 12.48$); $M = 96.42$ ($SD = 10.92$); $M = 94.38$, ($SD = 13.17$) in each low, moderate and high anxiety group respectively. Positive-Internality: $M = 33.19$ ($SD = 5.32$), $M = 32.05$ ($SD = 4.96$), $M = 32.06$ ($SD = 5.51$), Positive-Stability: $M = 34.59$ ($SD = 4.05$), $M = 33.97$ ($SD = 3.84$), $M = 32.16$ ($SD = 4.93$), Positive-Globality: $M = 30.09$ ($SD = 5.56$), $M = 30.39$ ($SD = 5.13$), $M = 30.16$ ($SD = 5.38$), in each low, moderate and high anxiety group respectively. However, the results indicate the insignificant of anxiety differences on the positive

dimensions.

3.2 Different Age-Groups and Negative-Globality

From a few of previous research that related to similarities and differences of attributional style on adolescent development, whether the youth will give meaning for attribution or feelings of anxiety. That is, may vary on the stage of adolescent development; however, most of the research has viewed as a single developmental stage. To the three stages of adolescence: early adolescence or the period of puberty (10 to 13 years), middle adolescence or the period of identification (14 to 16 years), and late adolescence or the period of identity formation (17 years and older) [16]. The mean of age averaged 17.15 years ($M = 17.15$, $SD = 2.79$) and adolescents were classified into two age groups which are (1) the adolescents with less than 16 years (early, middle adolescence, younger), and (2) adolescents with more than 17 years (late adolescence, older).

Table 2 presents the mean and standard deviations for adolescent attributional style questionnaires scores and anxiety for gender of younger and older group. The t -tests were conducted to compare males and females by younger and older group to ascertain whether or not there were between group differences on the each of attributional dimensions as well as the anxiety scores. Significant between group differences for gender were found on Negative-Globality ($t = -2.22, p < 0.05$), and Total-Globality ($t = 2.05, p < 0.05$). However, the results revealed no statistical relationship among other attributional dimensions and the anxiety scores, such that the older adolescents exhibited more negative-globality pattern than the younger group. Specifically, among the mostly adolescents in this group, female adolescents reported more negative-globality pattern than other youths.

4. Discussion

The results from this sample of youths with transfusion-dependent thalassemia revealed that the

Table 2 Group means and standard deviations for adolescent attributional style questionnaires scores and anxiety for gender of younger and older group.

Attributional dimensions and anxiety	gender								test
	male				female				
	age group		age group		age group		age group		
	< 16 yrs (<i>n</i> = 31)	> 17 yrs (<i>n</i> = 17)	< 16 yrs (<i>n</i> = 21)	> 17 yrs (<i>n</i> = 33)	< 16 yrs (<i>n</i> = 21)	> 17 yrs (<i>n</i> = 33)	< 16 yrs (<i>n</i> = 21)	> 17 yrs (<i>n</i> = 33)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>
Positive Composite	96.39	13.28	96.12	9.89	95.90	12.47	96.36	12.31	-0.036
Negative Composite	62.35	20.24	64.65	18.45	59.90	23.00	65.73	16.31	-1.050
Overall Composite	34.03	24.60	31.47	21.45	36.00	27.97	30.64	23.33	0.815
Positive-Internality	32.65	5.44	32.88	4.36	31.81	5.42	32.33	5.49	-0.204
Negative-Internality	22.45	6.57	22.65	7.31	21.48	7.96	22.82	5.57	-0.533
Total-Internality	10.19	8.17	10.24	8.24	10.33	10.13	9.52	7.93	0.292
Positive-Stability	33.42	4.53	33.35	3.50	33.24	4.94	34.12	4.32	-0.595
Negative-Stability	18.94	7.63	18.41	6.30	18.00	7.74	18.52	6.15	0.057
Total-Stability	14.48	8.90	14.94	7.37	15.24	10.04	15.61	8.82	-0.339
Positive-Globality	30.32	5.43	29.88	4.62	30.86	4.49	29.91	6.10	0.607
Negative-Globality	20.97	7.94	23.59	7.38	20.43	8.14	24.39	7.39	-2.225*
Total-Globality	9.35	9.86	6.29	9.39	10.43	9.10	5.52	10.75	2.055*
Anxiety	32	17	32	12	35	17	36	13	-0.357

* The mean difference is significant at the 0.05 level.

youths who provide internal, stable, globality dimensions for negative (bad) events report a higher level of anxiety compared with the youth who offer external, unstable, specific attributional dimensions and rate their anxiety as lower. Thus, results from this research support the association between attributions and anxiety conducted by the attributional reformulation of the learned helplessness model of depression [3]. Moreover, it is consistent with findings from other youth studies, for instance, sex differences, attributional style, and depressive symptoms among adolescents [17], attributional styles and psychopathology in pediatric chronic-illness groups [18], sex difference in depression and explanatory style in children [10].

Additionally, as hypothesized that higher level of anxiety symptoms associated with more internal, stable, global attributions for negative event and more external, unstable, specific attributions for positive (good) events, the results from this study is consistent with research drawing of psychopathology for examining cognitive style in adult such as attributional style in depression:

A meta analytic review [19]; the role of cognition in depression: a critical appraisal [20].

One of the most interesting findings that emerged from this research regarding two significant groups of age differences is the Negative and Total Globality dimensions. A comparison of attributional dimensions between two groups of age (at each of males and females), regardless of the level of anxiety symptoms, is exhibited only between group differences in patterns of Negative-Globality and Total.

The Globality attributional dimensions can be seen in Table 2. The Negative-Globality scores revealed the highest mean ($M = 24.39$, $SD = 7.39$) when compared with other Negative Attributional Dimensions. On the other hand, the Positive-Globality scores report the lowest mean ($M = 29.91$, $SD = 6.10$) when compared with other positive Attributional Dimensions for the adolescent girls more than 17 years group. That is, on Negative-Globality dimensions ($t = -2.22$, $p < 0.05$) and Total Globality dimensions ($t = 2.05$, $p < 0.05$), the adolescent girls more than 17 years have assessed more maladaptive patterns than any counterparts, as well as

the highest mean of anxiety scores ($M = 36$, $SD = 13$) that found on these older adolescent girls. Specifically, females adolescents more than 17 years evidenced number than males adolescents more than 17 years for twice ($N = 33:17$). Thus, the cognitive process involved in anxiety is the attributional style which can explain as for how the individual adolescents generalizable across negative situations (global) it places them at increased risk for future anxiety episodes, especially, among the older adolescent girls.

Negative-Globality for Attributional Style: Issues Specific to Older Adolescent Girls with Transfusion-Dependent Thalassemia

With major theoretical model have the potential to explain the emergence of gender differences in anxiety or depression during adolescence such as the gender intensification hypothesis [21], this hypothesis predicts that as they become pubertal, boys will identify more strongly with the masculine stereotype and girls will identify more strongly with the feminine stereotype and it can explain gender divergence in a development pattern as to link feminine role with more depression. For example, several studies have found that puberty usually negative aspect for girls because pubertal change being a non-preferred shape and reproductive potential and develop fatty deposit characteristic of the adult woman [22, 23] found that body image (non-preferred shape) are associated significantly with anxiety symptoms among adolescents. Also, non-preferred body image has been found to emerge of anxiety in female more than the anxiety of male among both adolescents [24, 25].

However, boys usually reach to pubertal physical changes approximately 18 months later than girls, so they have experienced these stressful life transitions at different times, rather than concurrently [26]. With biological and social process changing that have been occurring at different times for the young adolescents (age less than 16 years) or older adolescent boys (age more than 17 years), however, for the older adolescents' girls (age more than 17 years), they experienced more

challenges on pubertal transition and illness affected at this times (age) than the young adolescents or the older adolescent boys. Thus, the cognitive process as the pessimistic attributional style that predicts negative life events such the effect around themselves defined as endorsed greater negative-globality than did any group of young adolescents.

The older adolescent girls were exposed to the others cognitive transitions as school transitions to junior school, higher educational demand, and expectations. Thus, they also experience peer group changes, school transitions [27] as well as the presence of severe chronic illness among them, is usually constructed as a major stressor [28] to put them at an increased risk of anxiety. In fact, the synchronicity of stressful events in physical appearance, life transitions, and perceived illness stress have been provided for higher rates of anxiety among adolescent girls compared with those among adolescents boys [29, 30].

Wallander and Varni [31] model of psychosocial adaptation to chronic disease identifies life stress as a key risk factor for adjustment problem. Specifically, prior research suggested that adolescent girls may simultaneously experience multiple significant life events, in research Adolescents Depression: Why More Girls? [30] Study of longitudinal data on 335 adolescents. For the results revealed that adolescents are at risk for developing anxiety affected by 12th grade (more likely than 17 years) because they experienced more challenges in early adolescences than boys. Other researches, "Stress and life events during childhood and adolescence" [32], "Desirability of various change events among adolescents: Effects of exposure, sex, age and ethnicity" [33], and "Adolescence, stress, and psychological well-being" [34] provide the evidence that the adolescent girls have the meaning for negative life events with significant gender differences and generalizability across situations (globality).

Finally, the older adolescent girls, the presence of transfusion-dependent thalassemia are usually

constructed as a great anxiety or negative life events included with pubertal transition and influence of self-concept, coping style on psychological adjustment that occurred at the same time, so the style how to seek for reasons for self-concept with stress and anxiety. Meanwhile, they believed that adverse events could affect everyone, everything and anytime around their environment that it promoted pessimistic (negative) attributional style, which refers to negative-globality.

5. Conclusions

In conclusion, findings from the significance test of the combine results are consistent with the data from other studies, the results from this sample of transfusion-dependent thalassemia adolescents reveal that elevated anxiety symptoms were correlated significantly with more depressive (negative) attributional style. Also, the relationship between anxiety symptoms and attribution for negative events is stronger than the anxiety symptoms and attribution for positive events. Moreover, results explored the only statistically significant age (group) difference for the negative-globality, total-globality and anxiety symptoms. Particularly, it has been the older adolescent girls who have found the most negative-globality that caused from pubertal transition, coping style (social process), and stress life events.

Finally, because of cognitive psychological research, findings from this study combined with a meta-analytical review show that all times change on behavior or cognitive process. Future researches should examine these alternative longitudinal research designs on continuous times and add semi-structured questionnaires (e.g., duration of disease, the age of onset, clinical complications) or whether these findings extend to youth with other chronic diseases. Taken together, future researches should explore the differences and similarities in the style of attributions among these three stages of adolescence: early adolescence or the period of puberty (10 to 13 years), middle adolescence or the period of identification (14

to 16 years), and late adolescence (17 years and older). Because the meanings adolescents assign to negative life events or how they assess or respond to dealing with anxieties may vary depending on the stage of adolescent development. Thus, these approaches will contribute to increased appropriate knowledge, enabling health care professionals to provide proper interventions and how to cope with the chronic illness that maximizes the efficacy of resilience in all thalassemia adolescents and their families.

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