



# Prevalence and Correlates of Alexithymia and Its Relationship With Life Events in Chinese Adolescents With Depression During the COVID-19 Pandemic

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**Objectives:** The incidence of psychological and behavioral problems and depression among adolescents is increasing year by year, which has become an important public health problem. Alexithymia, as an important susceptible factor of adolescent depression, may continue to develop and strengthen under the stimulation of COVID-19-related stressors. However, no studies have focused on alexithymia in adolescent depression during the pandemic in China. This study aims to investigate the incidence and related factors of alexithymia in adolescent depression during the pandemic.

**Methods:** Three hundred adolescent patients were enrolled from October 2020 to May 2021. The general demographic information of all participants was collected, and the clinical characteristics were assessed by the 20-item Toronto Alexithymia Scale (TAS-20), the Adolescent Self-Rating Life Events Check (ASLEC) List, the Childhood Trauma Questionnaire (CTQ), and the Positive and Negative Suicide Ideation (PANSI) Inventory.

**Results:** The incidence of alexithymia was significantly higher among adolescents with depression (76.45%) during the pandemic. There were significant differences in school bullying, disease severity, ASLEC score, CTQ score and PANSI score between adolescents with and without alexithymia. In addition, learning stress, health and adaptation problems during the pandemic may be influential factors in alexithymia of adolescent depression ( $P < 0.05$ ).

**Conclusions:** According to the results, we found a high incidence of alexithymia in adolescent depression during the pandemic. More support and attention from families, schools and society is needed to develop preventive and targeted psychological interventions as early as possible.

**Keywords:** depression, alexithymia, life events, COVID-19, adolescent

## INTRODUCTION

Depression is one of the most common affective disorders among adolescents, which seriously affects quality of life and social functions, and has become one of the major diseases threatening the healthy growth of adolescents. The prevalence of adolescent depression varies from 9 to 25% in different studies and countries, which is increasing year by year (1–3). Compared with adult depression, adolescent depression has a longer duration, more episodes, higher recurrence rates, more severe symptoms and higher disability rates (4–6). About 50% of patients with recurrent adult depression reported their initial onset before the age of 18, and 48% of patients with early-onset depression had attempted suicide, compared with 26% of those with adult-onset depression (7). These highlight the importance of early and effective management of adolescent depression.

Alexithymia is a defect characterized by difficulties in identifying, distinguishing and expressing emotions (8, 9). It is a common psychosomatic phenomenon that is considered to be associated with various psychopathic symptoms such as depression, anxiety, somatization, hostility, and paranoia (10). It increases susceptibility to mental disorders, reduces the effectiveness of psychotherapy, and negatively affects the development and severity of psychopathological symptoms (11–14). Patients with depression usually use emotional suppression strategies to defend themselves from pain, and have difficulty identifying and describing emotions subjectively (15, 16). Therefore, patients with depression exhibit higher rates of alexithymia than patients with other mental disorders (17, 18).

The prevalence of alexithymia has been reported to be ~10% in the general population (19), and 7.3–29.9% in adolescents (20, 21). Alexithymia is considered as a cumulative process that begins in early childhood and continues to develop and reinforce in the social context (22). It is associated with negative life events in childhood, family environment, interpersonal relationships and social support (23–25). Among these, negative life events in childhood are considered to be the main risk factor for alexithymia, which hinders the ability to identify and express emotions, thereby increasing psychological distress of adolescents (26, 27).

As an intense stressor, the novel coronavirus disease (COVID-19) has caused great psychological distress due to its rapid transmission, high mortality, lack of effective treatments and large-scale quarantine measures (28–30). The psychological impact of the epidemic was reported to be rated as moderate or severe by 53.8% of participants, and 16.5% (28.8%) reported moderate to severe symptoms of depression (anxiety) (31). Due to immature immune systems, insufficient self-protection, and weak psychological tolerance, adolescents have become one of the most susceptible subgroups of COVID-19, with significant impact on their health, academic, economic and psychological status (32–34). Therefore, it is important to explore the relationship between alexithymia and life events in adolescents during the pandemic.

The purpose of this study is to investigate the prevalence of alexithymia and its relationship with life events in Chinese adolescent depression during the pandemic, so as to further

understand the possible effects of alexithymia on the formation and recurrence of adolescent depression, and to provide important clinical information for the formulation of preventive and targeted treatment plans.

## METHODS

### Participants

From October 2020 to May 2021, a total of 300 adolescent patients with depression from psychiatric outpatients and inpatients in 7 hospitals in Anhui Province (Chaohu Hospital of Anhui Medical University, Hefei Fourth People's Hospital, Fuyang Third People's Hospital, Suzhou Second People's Hospital, Bozhou Hospital Affiliated to Anhui Medical University, Maanshan Fourth People's Hospital, and the Second Affiliated Hospital of Bengbu Medical College) were enrolled in this study. Inclusion criteria: (1) "International Statistical Classification of Diseases and Related Health Problems (ICD-10-F32)" diagnosis of depression; (2) age between 13 and 18 years old with a certain level of comprehension. Exclusion criteria: (1) diagnosis of bipolar disorder and other types of mental disorders; (2) severe somatic diseases or a non-collaborator. Approved by the medical ethics committee of Chaohu Hospital affiliated to Anhui Medical University (202009-kyxm-04) before the start of the study, all subjects and their guardians had informed consent before the survey. Participants could terminate the study at any time. The real name system was used to facilitate clinical follow-up. All questionnaires were archived and the results were kept strictly confidential.

### Design and Measurements

A face-to-face questionnaire was conducted by uniformly trained and qualified investigators from October 2020 to May 2021. The contents of this questionnaire include: (1) general demographic characteristics; (2) Mental health status: the 20-item Toronto Alexithymia Scale (TAS-20), the Adolescent Self-Rating Life Events Check (ASLEC) List, the Childhood Trauma Questionnaire (CTQ) and the Positive and Negative Suicide Ideation (PANSI) Inventory.

The general demographic characteristics, such as gender, age, only child (yes or no), total disease course, severity of illness (disease-free, basically disease-free, extremely light, mild, moderate, heavy, severe, or extremely heavy), relationship with classmates (good, average, or bad), relationship with teachers (good, average, or bad) and school bullying (yes or no).

The TAS-20 scale consists of 3 factors (difficulty identifying feelings, difficulty describing feelings and externally-oriented thinking). There are 20 items on a 5-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree), with a total score of 20–100. The higher the score, the more severe alexithymia (35, 36). The total score of TAS-20  $\geq$  61 is often used as the criterion of alexithymia (37). The Cronbach's  $\alpha$  coefficient for the TAS-20 was 0.83, and the test-retest reliability coefficient was 0.87 (38).

The ASLEC scale includes 27 negative life events and assesses status over the last 6 months. It first determines whether the event occurred, and is categorized into 5 levels, from 1 (no

**TABLE 1** | General demographic and clinical characteristics of adolescents with depression.

	The whole sample N = 293		Alexithymia N = 224		Non-alexithymia N = 69		Statistics	
	N	%	N	%	N	%	$\chi^2$	P
Female	215	73.4	166	74.1	49	71.0	0.3	0.6
Only child	118	40.3	85	37.9	33	47.8	2.1	0.1
Relationship with classmates							-1.5	0.1
Good	53	18.2	38	17.1	15	21.7		
Average	177	60.8	133	59.9	44	63.8		
Bad	61	21.0	51	23.0	10	14.5		
Relationship with teachers							-0.3	0.7
Good	52	17.9	38	17.1	14	20.3		
Average	172	59.1	136	61.3	36	52.2		
Bad	67	23.0	48	21.6	19	27.5		
School bullying	138	47.1	116	51.8	22	31.9	8.4	0.004
Severity of illness							-2.2	0.03
Disease-free	0	0.0	0	0.0	0	0.0		
Basically disease-free	1	0.3	1	0.4	0	0.0		
Extremely light	7	2.4	5	2.2	2	2.9		
Mild	50	17.1	33	14.7	17	24.6		
Moderate	89	30.4	67	29.9	22	31.9		
Heavy	109	37.2	86	38.4	23	33.3		
Severe	37	12.6	32	14.3	5	7.2		
Extremely heavy	0	0.0	0	0.0	0	0.0		
	<b>Mean</b>	<b>SD</b>	<b>Mean</b>	<b>SD</b>	<b>Mean</b>	<b>SD</b>	<b>T/Z</b>	<b>P</b>
Age (years)	15.2	1.7	15.3	1.7	15.0	1.8	-1.0	0.3
Total disease course (month)	20.3	18.3	21.1	18.6	18.0	17.3	-1.2	0.2
ASLEC score	54.1	21.7	57.3	20.9	43.8	21.1	-4.6	<0.001
CTQ score	50.7	13.1	51.9	12.9	47.0	13.0	-2.6	0.01
PANSI score	78.3	23.0	80.3	22.6	72.1	23.4	-3.2	0.001

ASLEC, the Adolescent Self-Rating Life Events Check List; CTQ, the Childhood Trauma Questionnaire; PANSI, the Positive and Negative Suicide Ideation Inventory.

**TABLE 2** | Independent factors associated with alexithymia by binary logistic regression analysis.

Variable	B	SE	Wald	P	OR	OR 95%CI
Dimension II	0.12	0.04	10.47	0.001	1.12	1.05–1.20
Dimension V	0.14	0.05	7.74	0.005	1.15	1.04–1.26

Dimension II, Learning stress factors; Dimension V, Health and adaptation problem.

impact) to 5 (extremely heavy impact), according to the degree of physical and psychological impact on adolescents. It contains 6 dimensions: interpersonal relationship factors (I), learning stress factors (II), punishment factors (III), loss of relatives, friends and property factors (IV), health and adaptation problem factors (V), and other factors (VI) (39). The Cronbach's  $\alpha$  coefficient for the ASLEC showed a high internal consistency reliability of 0.849 (40).

As an internationally recognized assessment tool for childhood trauma, the CTQ is one of the most widely used self-report questionnaires to investigate different forms of abuse and neglect during childhood. It contains 28 items and 5 factors (emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect). There are 3 items for effectiveness evaluation (41). The overall Cronbach's  $\alpha$  coefficient for the

CTQ was 0.77, and the Cronbach's  $\alpha$  coefficient for each subscale ranged from 0.41 to 0.68 (42).

The PANSI scale consists of 14 items, including 6 positive suicidal ideation and 8 negative suicidal ideation. Each item is assessed by a 5-point Likert scale, ranging from 1 (none) to 5 (most of the time). Positive suicidal ideation is scored in reverse and added to the scores of the negative suicidal ideation items to obtain a total score of suicidal ideation. The higher the score, the higher the degree of suicidal ideation (43). The Cronbach's  $\alpha$  coefficient for the PANSI was 0.92 (44).

## Statistical Analysis

SPSS23.0 statistical software was used to establish a database for analysis. Comparisons between the alexithymia and non-alexithymia groups regarding general demographic and

clinical characteristics were performed by independent sample *t*-test, Mann-Whitney *U*-test and chi-square-test. Binary logistic regression analysis was performed to identify independent correlates of alexithymia during the pandemic, using alexithymia as the dependent variable and variables that differed significantly between alexithymia and non-alexithymia groups in univariate analysis as independent variables. Two-tailed tests were used in all hypotheses with the significance level of 0.05.

## RESULTS

### General Demographic and Clinical Characteristics of All Participants

Three hundred questionnaires were received, of which 293 were valid, with a response rate of 97.7% (293/300). Among the 293 adolescent patients with depression, the average age was  $15.2 \pm 1.7$  years, including 78 males (26.62%) and 215 females (73.38%), and the incidence of alexithymia was 76.45% (224/293) during the pandemic (see **Table 1** for details).

### Comparison of General Demographic and Clinical Characteristics Between the Alexithymia Group and Non-alexithymia Group in Adolescents With Depression

A total of 224 individuals (76.45%) were identified as alexithymia based on the TAS-20 score  $> 61$ . Comparisons between groups showed no significant differences in the prevalence of alexithymia among patients with different gender, age, only child, total disease course, and relationships with classmates and teachers ( $P > 0.05$ ). There were significant differences in school bullying, disease severity, ASLEC score, CTQ score and PANSI score between adolescent patients with and without alexithymia during the pandemic ( $P < 0.05$ ; see **Table 1** for details).

### Independent Factors Associated With Alexithymia by Binary Logistic Regression Analysis

In the binary logistic regression analysis, school bullying, disease severity, total ASLEC score and its 6 dimensions scores (interpersonal relationship factors, learning stress factors, punishment factors, loss of relatives, friends and property factors, health and adaptation problem factors, and other factors), as well as CTQ and PANSI scores were used as potential factors for alexithymia. Greater learning stress ( $P = 0.001$ , OR = 1.122, 95% CI 1.047–1.204) and more serious health and adaptation problems ( $P = 0.005$ , OR = 1.147, 95% CI 1.041–1.264) in adolescent patients with depression were both independently associated with alexithymia during the pandemic (see **Table 2** for details).

## DISCUSSION

As far as we know, this is the first cross-sectional study of alexithymia and its relationship with life events in Chinese adolescent patients with depression during the pandemic. The results showed that 76.45% of adolescent patients reported

alexithymia, which was significantly higher than the prevalence of alexithymia (26.75%) in adolescents with depressive symptoms before the outbreak (45). In addition, previous studies have shown that the prevalence of alexithymia ranges from 7.3 to 29.9% in adolescents (20, 21), from 9 to 17% in males and 5 to 10% in females of working age (46, 47), over 20% in the older age groups, and even over 30% in the oldest populations (48). The prevalence of alexithymia was highest (26.9%) in adults with depression compared to other psychiatric disorders (49).

Using different demographic data and self-assessment factors, our results suggested that school bullying, severity of depression and total scores of the ASLEC, CTQ, and PANSI scale were influential factors of alexithymia. Greater learning stress and more severe health and adaptation problems were independently associated with alexithymia in adolescents with depression during the pandemic. Previous studies have suggested that alexithymia may be a cumulative process that begins in early childhood, develops and reinforces in the social environment (22). After controlling for psychopathological factors, the association between alexithymia and childhood abuse and neglect variables remained (50). Negative life events may enhance the development of alexithymia by disrupting normal emotions, and some personality traits or behaviors associated with alexithymia may in turn increase psychological distress in adolescents (15, 25, 51). Individuals with alexithymia have difficulty recognizing and describing emotions, a reduced ability to distinguish between emotional states and physical sensations, and a lack of symbolic thinking. This leads to their inability to regulate emotions, which causes or aggravates physical and mental health problems (such as depression and anxiety), as well as poor health-related quality of life (13, 52).

The ability to identify and regulate emotions in adolescent patients with depression may play a key role in coping with stress, adapting to their environment, and improving academic performance. During the pandemic, adolescents have become one of the most vulnerable subgroups because of their immature immune system, lack of self-protection and weak psychological tolerance. Characteristics of COVID-19, such as acute onset, high mortality, long-term social isolation and its overwhelming negative news, also further aggravate the physical and mental impairment of adolescent patients. It was reported that 31.5% of the students had anxiety and fear during the epidemic, and they faced the impact of infection, stagnant family income, pressure on tuition fees and changes in teaching methods, which seriously affected their mental health and learning ability (33, 34). Previous studies have shown that 96% of the students have learning difficulties, 54.0% have memory difficulties, and 67.0% have attention problems. Ninety percentage have increased overall learning difficulties during the pandemic (53). Under greater learning pressure, adolescent patients are more likely to experience academic anxiety and burnout characterized by insecurity, avoidance and procrastination, as well as performance and environmental concerns (54), thus aggravating alexithymia.

In addition, the interpersonal communication style of patients with alexithymia are characterized by apathy, social avoidance and hostile behavior. They have a reduced ability to regulate their emotions through social interactions, and cannot spontaneously

express negative, happy and angry emotions (55, 56), thus affecting their social interactions and interpersonal relationships to a great extent (57). It is difficult for them to perceive and understand the communication and behavior of others, which aggravates the interpersonal problems and leads to a decline in social support. Social isolation is considered to be one of the strongest predictors of suicidal ideation and suicide attempts (58).

This study has the following shortcomings: (1) As this study was a cross-sectional survey, we were unable to clarify the causal relationships between variables or to study the effective mediating effect of variables. (2) As part of the data in this study were self-reported, the results were easily affected by the emotional changes of participants during the survey, resulting in the recall bias of negative life events. (3) The subjects of this study were adolescent patients with depression from psychiatric outpatients and inpatients in 7 hospitals. It was reported that since puberty, the rate of depression increased gradually in girls, almost 2–3 times than that of boys (59). Due to the influence of gender differences in adolescent depression, the male participants included in this study were lower than females. (4) Because of the acute onset of the epidemic, we were unable to measure the prevalence of alexithymia in adolescent patients before the outbreak, so we cannot exclude that patients had a high prevalence of alexithymia in the past. Although the TAS-20 scale is increasingly used with adolescents, the factor structure and psychometric properties of the Tas-20 may have systematic age differences (60), so our results may be biased. Therefore, further prospective cohort studies of adolescent patients are of great significance.

## CONCLUSION

This study conducted a cross-sectional survey of alexithymia and its related factors in 300 adolescent patients with depression admitted to 7 hospitals in Anhui Province during the pandemic. The results showed that the incidence of alexithymia in adolescent patients increased significantly (76.45%) during the pandemic. COVID-19 as a strong stressor, facilitates the development of alexithymia by affecting the identification, expression and regulation of emotions through various negative life events. In turn, the personality traits or behaviors associated with alexithymia affect the physical and mental health of adolescent patients, reduce the ability to adapt to the environment, affect interpersonal relationships, and lead to social isolation, thus greatly increasing the risk of self-harm

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and suicide. Therefore, families, schools, and society should give more support and attention to adolescent patients with depression during the pandemic, conduct targeted epidemic knowledge campaigns to reduce the negative impact of COVID-19-related stressors on the mental health of adolescent patients and to increase their confidence in fighting the epidemic. In addition, improving the family environment, perfecting the mental health service system in schools and communities, and further conducting prospective cohort studies of adolescent patients over 8 weeks and half a year are of great significance for the early formulation of preventive and targeted psychological interventions.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Medical Ethics Committee of Chaohu Hospital Affiliated to Anhui Medical University (202009-kyxm-04). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

## AUTHOR CONTRIBUTIONS

YH, LX, FG, FS, CC, JW, XWe, and XLu completed the preliminary questionnaire design and data collection. XWa, XLi, and CG completed the data collation, statistical analysis, and the first draft. HL supervised in designing and critically read and revised the manuscript. All authors participated in revising and confirming the final manuscript.

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