Influence of Alexithymia on Somatic Complaints among Japanese Adolescents: A survey research

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Abstract

Background

The purpose of this study is to examine alexithymic tendencies in Japanese adolescents (aged 12–20) and their effects on somatic complaints.

Methods

Participants were Japanese adolescents ($n = 2,759$). Alexithymic tendencies were assessed by the Alexithymia Scale for Adolescents (ASA), and somatic complaints by the Somatic Complaint List (SCL).

Results

The following results were obtained. 1) ASA total scores remained at a high level from early to late adolescence. 2) Among the ASA subfactors, difficulty identifying feelings (DIF) and difficulty describing feelings (DDF), increased during adolescence, whereas externally oriented thinking (EOT) decreased; as a result, the ASA total scores remained high. 3) DIF significantly affected somatic complaints among adolescents irrespective of their academic year and gender. 4) DDF only had an effect of increasing somatic complaints in junior high and high school-aged male participants, and this effect disappeared as respondents' age grew and they were university students. This shows that the effect of alexithymic tendencies on somatic complaints changed with age.

Conclusion

Compared to the results of previous studies, the results of this study showed that alexithymic tendencies among Japanese adolescents are consistently high. The study further revealed that the increasing somatic complaints were consistently influenced by DIF.

1. Background

The concept of alexithymia was proposed by Sifneos [1] as a commonly occurring feature of psychosomatic patients. Subsequent studies have identified the following characteristics among individuals with alexithymic tendencies: (a) difficulty in identifying emotions and distinguishing between emotions and the bodily sensations associated with emotional arousal; (b) difficulty in recognizing and talking about their emotions; (c) lack of imaginative capacities, constricted imaginative processes; (d) a tendency to talk regarding superficial things without referring to the individual's own feelings (i.e. an externally oriented cognitive style) [2, 3].

Numerous studies have compared the alexithymic tendencies of healthy adults and clinical groups with psychosomatic symptoms, and the clinical groups revealed significantly higher alexithymic tendencies than the control groups [4–7]. In addition, it has been found that alexithymic tendencies influence somatic complaints even when factors such as disease or depression are controlled [8].

The American Psychological Association defines adolescence as the period of human development that starts with puberty (10–12 years of age) and ends with physiological maturity (approximately 19 years of age), although the exact age span varies across individuals [9]. In addition, Blos [10] classifies adolescence into early adolescence (age 12–15), mid-adolescence (age 15–18), and late adolescence (age 18–20) [11]. This classification is reflected in the education system of Japan [11]. Therefore, in this study, adolescence is defined as 12–20 years of age. In Japan, adolescence is considered to be a period of physical and mental instability, and several problems with adaptation to school life and mental health have been reported [12]. In addition, it is known that in the early stages of school refusal, repeated general malaise eventually comes to the surface in the form of truancy, and it is said that psychosomatic disorders and school refusal are closely related [13]. Cases have been identified wherein although there were no school refusals, some junior high school and high school students visiting the school infirmary with complaints of physical symptoms relevant to internal medicine had psychological problems as a reason behind their claims [14]. Therefore, alexithymic tendencies among those aged between 12 and 20 is an important viewpoint to consider for adolescent maladaptation.

There are fewer studies on adolescent alexithymia than those on adulthood. However, previous studies focusing on adolescence have reported significant correlations between alexithymic tendencies and somatic complaints [15–17], such as adolescents with suspected irritable bowel syndrome were identified with significantly higher level of alexithymic tendencies [18], and that alexithymic tendencies had a significant positive correlation with depression [19–21].

However, there is no consensus on the characteristics or changes over time in alexithymic tendencies among adolescent [15, 22–28]. In Finnish youths (aged 12 to 17), alexithymia scores decreased from early to mid-adolescence [25]. Canadian youths (aged 13–21) showed no significant difference in alexithymia scores between the ages of 13 and 18, yet showed a significant decrease when participants were aged 19 or older [24]. The study considers decreasing alexithymia scores to be due to emotional consciousness naturally increasing with age, as proposed in alexithymia developmental theory [29, 30]. However, Seo et al. [26] found that alexithymic tendencies remained constant without increasing or decreasing in Korean adolescents (aged 12–16). These differed findings may be influenced by varied cultures in Europe, North America, and Asia. In Japan, Moriguchi et al. [6] reported that alexithymia scores in Japanese adolescents (aged 14–19) were higher than in Japanese adults. Tannaka, Terai, and Umezawa [27] found that alexithymic tendencies may increase with age even among Japanese adolescents aged 12–15 years.

It has been highlighted that adolescents may not be able to accurately understand the questions of TAS-20, which is the most widely used scale in alexithymia research for adults [31], and it is therefore difficult to evaluate alexithymic tendencies in adolescents, especially among early adolescents [15, 24]. Some

studies created rephrased TAS-20 scales that are easier for children to understand [15, 27]. However, no study have yet clarified changes in alexithymic tendencies from early to late adolescence using an alexithymia scale developed for adolescents.

Therefore, the purpose of this study is to examine whether Japanese adolescents will show the same tendencies as those shown in research (Säkkinen et al. [25] and Parker et al. [24]) based on the developmental theory of alexithymia [29, 30] or will show high alexithymia consistently during adolescence between the ages of 12 and 20, as reported in the same Asian study [26]. Adolescence is a time when adaptation problems such as school refusal become apparent, and it is also witnessed as a predominant period of eating disorders and mental disorders [32]. In particular, somatic complaints are indications of clinical issues and can lead to effects on mental health in adulthood [33]. Therefore, this study will also highlight the effects of alexithymic tendencies on somatic complaints.

2. Methods

2.1 Participants

The survey was implemented on students from public junior high and high schools with consent from their respective principals and homeroom teachers, and on students from national and private universities who consented to participate in the survey. Class teachers distributed the questionnaires to junior high and high school students, and lecturers distributed them to university students. The questionnaires were distributed simultaneously, and participants were asked to respond before leaving class, post which their responses were collected. The homeroom teachers and lecturers also verbally explained to the students all written instructions detailing the survey procedure provided to them in advance. Participants would answer anonymously so that individuals could not be identified or analyzed, as participation was optional. The survey form was distributed to 3,034 Japanese adolescents (aged 12–22); answers that contained omissions and answers obtained from subjects who were aged 21 and over were considered invalid responses and were excluded. Thus, the final number of valid responses was 2,766, obtained from participants aged 12–20 (626 male junior high school students, 580 female junior high school students, 620 male high school students, 714 female high school students, 124 male university students, and 102 female university students). This research study was approved (14–504) by the Research Ethics Review Committee of the Graduate School of Education and Human Development, Nagoya University.

2.2 Questionnaires

2.2.1 Alexithymia Scale for Adolescents (ASA)

The ASA [27] is a self-administered scale based on the Japanese translation of Alexithymia Questionnaire for Children (AQC) [15]. Although AQC uses a 3-point response scale, we used a 5-point Likert scale to facilitate a comparison with the TAS-20 [31]. As with the TAS-20 and AQC, the subscales were based on three factors: difficulty in identifying feelings (DIF); difficulty in describing feelings (DDF); and externally oriented thinking (EOT). The reliability of the ASA in this study was $\alpha = .76$, and for each subscale, it was $\alpha = .83$ for DIF, $\alpha = .67$ for DDF, and $\alpha = .40$ for EOT.

2.2.2 Somatic Complaint List

This research used a Japanese-translated version of the self-administrated scale SCL [15, 34]. The SCL consists of 11 items, and participants were asked to respond on a 3-point scale ranging from “never” (1 point) to “often” (3 points) regarding the frequency of physical symptoms they have experienced over the past two weeks. The reliability of the SCL in the present study was $\alpha = .73$.

3. Results

3.1 Changes in alexithymic tendencies during Japanese adolescence

Table 1 showcases the results of a two-factor analysis of variance of the scores of three subscales of ASA (DIF, DDF, and EOT), the total scores and the mean values and standard deviation of the total scores of the SCL, and the gender and academic year of participants.

Table 1
Two-way ANOVA for Factors of Alexithymia Scale for Adolescents and Somatic Complaints Scores on Gender and Grades

	DIF			DDF			EOT			Total			SCL		
<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>M</i>	<i>SD</i>	<i>F</i>
Academic year (age)			14.25**			9.59**			37.18**			2.92**			11.
Junior high school															
1st (12–13)	390	16.35	5.84	14.11	3.68		22.36	3.87		52.82	9.57		18.35	3.75	
2nd (13–14)	414	17.17	5.66	14.63	3.57		22.68	3.73		54.48	9.20		18.97	4.14	
3rd (14–15)	402	17.09	5.63	14.68	3.98		22.56	3.84		54.33	9.88		19.37	4.17	
High school															
1st (15–16)	449	19.07	5.73	15.54	3.91		20.75	3.58		55.35	9.67		17.77	3.33	
2nd (16–17)	433	18.62	5.69	15.11	3.84		20.44	3.59		54.17	9.67		17.81	3.41	
3rd (17–18)	452	18.89	6.26	15.43	3.87		20.33	3.29		54.65	9.88		18.42	3.12	
University (19–20)	226	18.68	5.19	15.92	3.63		20.34	3.44		54.94	8.3		18.15	3.13	
Gender			31.81**			23.86**			42.28**			8.26**			3.1
Male	1370	17.37	5.84	14.69	3.85		21.86	3.77		53.92	9.70		18.31	3.60	
Female	1396	18.59	5.79	15.35	3.79		20.90	3.71		54.83	9.42		18.50	3.71	

** $p < .01$, * $p < .05$, + $p < .10$.

The main effects of the academic year of participants were identified in the ASA total scores and three ASA subscales (DIF, DDF, and EOT). For the ASA total scores this was $F(6, 2752) = 2.92, p < .01, \eta_p^2 = .006$. For DIF it was $F(6, 2752) = 14.25, p < .01, \eta_p^2 = .030$, for DDF it was $F(6, 2752) = 9.59, p < .01, \eta_p^2 = .020$, and for EOT it was $F(6, 2752) = 37.18, p < .01, \eta_p^2 = .075$. However, multiple comparisons with Tukey's test revealed that there was only a significant difference at a level of 1% between the first year of junior high school and the first year of high school in terms of ASA total scores, indicating a virtually flat trend as the effect size of the difference ($d = .26$) was small. In the multiple comparisons of each subscale, for two subscales of the ASA (DIF and DDF), *DIF was higher in university students and high school students than in second- and third-year junior high school students*, with first-year junior high school students exhibiting the lowest scores for DIF. The effect size of the difference between all-year junior high school students and other-year students was small ($d = .24 - .47$). However, the difference between all-year high school students and university students evinced no effect size. For DDF as well, university students and third- and first-year high school students scored more than second-year high school students and third- and second-year junior high school students, with first-year junior high school students scoring the lowest. The difference between the first-year junior high school students and other-year students showed small to moderate effect sizes ($d = .27 - .50$). In this manner, an upward trend was observed in DIF and DDF. In contrast, junior high school students had higher EOT scores than high school students and university students, showing a downward trend. Moreover, the change in the ASA total scores was virtually flat as the upward trend of the subscales for DIF and DDF was offset by the downward trend of EOT, such that the ASA total scores remained high. This reveals that alexithymia total scores may remain high as individuals develop; however, the balance of the subscales may shift, indicating qualitative changes in alexithymic tendencies.

Next, we determined that in the ASA total scores and two ASA subscales (DIF and DDF), the main effect of gender was significant, and the scores of female participants were significantly higher than those of male participants. For the ASA total scores this was $F(1, 2752) = 8.26, p < .01, d = .10$, for DIF it was $F(1, 2752) = 31.81, p < .01, d = .21$, and for DDF it was $F(1, 2752) = 23.86, p < .01, d = .17$. In contrast, EOT male participants scored significantly higher, with $F(1, 2752) = 42.28, p < .01, d = .26$.

3.2 Changes in somatic complaints among Japanese adolescents

Table 1 showcases the mean values and standard deviations of the SCL. A two-by-seven (gender by academic year) two-factor analysis of variance was performed concerning somatic complaints. The main effect and interaction ($F(6, 2752) = 11.35, p < .01, \eta_p^2 = .025$) of the academic year were found to be significant. Multiple comparisons using Tukey's test revealed that somatic complaints were significantly more severe in the second and third years of junior high school than in other academic years. Moreover, as the interaction was significant when the difference in terms of gender was examined for each academic year, female junior high school students scored significantly higher than other groups. For the first year of junior high school this was $F(1, 2752) = 9.48, p < .01, d = .28$ for the second-year $F(1, 2752) = 6.91, p < .01, d = .22$ and for the third-year $F(1, 2752) = 4.02, p < .05, d = .18$. However, there was no difference in this regard in terms of gender between high school students and university students.

3.3 Influence of alexithymic tendencies on somatic complaints

In order to investigate the effect of alexithymic tendencies on somatic complaints, a simple regression analysis (forced input method) was performed with the ASA total scores as the independent variable and the SCL scores as the dependent variable for each type of academic institution and gender. ASA total scores for both male and female participants in all types of academic institutions were found to exert a significant positive effect on somatic complaints. For male participants, the results were $\beta = .38$, $R^2 = .14$, $p < .01$ for junior high school students, $\beta = .35$, $R^2 = .12$, $p < .01$ for high school students, and $\beta = .22$, $R^2 = .04$, $p < .05$ for university students. Meanwhile, for female participants, the results were $\beta = .33$, $R^2 = .11$, $p < .01$ for junior high school students, $\beta = .35$, $R^2 = .12$, $p < .01$ for high school students, and $\beta = .45$, $R^2 = .20$, $p < .01$ for university students.

Table 2 showcases the results of a multiple regression analysis using the three ASA subscales (DIF, DDF, and EOT) as dependent variables by the type of academic institution and gender.

Table 2
Multiple Regression Analysis for Predicting Somatic Complaints

	DIF	DDF	EOT	
Groups	β	β	β	R^2
Male				
Junior high school	.34**	.10*		.17**
High school	.31**	.09*		.14**
University	.33**			.11**
Female				
Junior high school	.40**			.16**
High school	.40**		.07*	.15**
University	.33**			.23**
** $p < .01$, * $p < .05$.				

The results reveal a significant positive association for the ASA subscale DIF in all types of academic institutions. The ASA subscale DDF showed a significant positive association in male participants at junior high school and high school, and the ASA subscale EOT showed only a positive association in female participants at high school.

4. Discussion

4.1 Alexithymic tendencies in Japanese adolescents

The present study investigated Japanese adolescents from junior high school to university and sought to clarify the changes that alexithymic tendencies exhibit. We will start by discussing differences in ASA total scores based on the academic year of participants. ASA and TAS-20 have same subscales, which comprise the same number of items with different expressions of individual items, but the average ASA scores (53.92 for males and 54.83 for females) herein were considerably similar with the average TAS-20 score for participants aged 14–19 years old in the study by Moriguchi et al. [6]. The mean values obtained from by Moriguchi et al. [6] (48.2 for males and 48.4 for females; the participants were 14–84 years old) indicate that the ASA total scores exhibit a higher trend in adolescents than in adults and that this level will start to decline after individuals reach their twenties. If we compare trends in the ASA total scores obtained in this study with values obtained in previous studies in other countries [24, 25, 28], we find that the level of alexithymic tendencies around the age of 12 is similar, but previous studies demonstrate a subsequent downward trend. In contrast, the scores for Japanese participants showed a tendency to remain at a high level into and beyond the second-year of junior high school. The results of this study appear to be similar to the tendency of Korean adolescents [26], wherein the alexithymia score does not change during adolescence.

Moreover, in terms of changes in the subscales, DIF and DDF were measured at higher levels among high school students than in previous studies [24, 25, 28]. The EOT subscale showed a downward trend similar to that of other countries [24, 25, 28] and a particularly large decline in scores was observed among high school students in Japan.

According to Moriguchi et al. [6], DIF and DDF tend to decrease from adolescence to the thirties, and EOT tends to increase with age from adulthood onward. Moriguchi et al. [6] also state that alexithymia has two different developmental pathways: the DIF/DDF pathway and the EOT pathway. Moriguchi et al. [6] argue that as EOT is more related to negative attitudes toward coping with stress than an interest in inner emotions, the increase in EOT with aging may reflect a weakening interest in seeking new coping methods in comparison with younger age groups. Thus, the results of the present study may reflect a growing interest in the inner self and the emotional aspects of phenomena in Japanese adolescents.

In contrast, we speculate that DIF and DDF were affected by the temporary difficulty that individuals experience in identifying and expressing emotions as their interest in such emotional aspects increases. A link between depression and alexithymia has been identified in several studies [35]. According to the Cabinet

Office of the Government of Japan [36], young people between the ages of 13 and 29 in Japan have lower self-esteem and basal mood than young people in other countries. This suggests that alexithymic tendencies in adolescence may be higher than those in other countries. In a study of adolescents in South Korea, while the alexithymia score (mean TAS-20K = 45.69) was rather different from those of the present study (mean ASA = 54.38), an increase in DIF was observed with the increasing age, as in the present study. A study found that alexithymia scores were significantly higher in university students with roots in Asian countries than in European–American university students [37]. This is said to be related to cultural values that encourage hiding emotions, which Asian parents instill in their children through home education [37]. Concerning Japanese adolescents, while there is no large difference in alexithymia scores in the first half of adolescence (junior high school students) compared to Europe and the United States, among high school students, the difference between Europe and American and Japanese people becomes greater. From the first year of high school in Japan, students are more likely to face stress, anxiety, and frustration about the experience of making their own career choices after completing compulsory education, as well as changes in their friendships and living environment, and changes relating to becoming independent from their families. The authors surmise that compared with other countries, young people in Japan may find it more difficult to express their emotions and thoughts, which as a result, may become internalized and further complicated. They may also tend to face difficulties in identifying their emotions and thoughts and communicating them in a manner that enables them to be understood by others.

The results of this study may have captured developmental changes in alexithymic tendencies among Japanese adolescents, especially concerning the particular influence of Japan's cultural sphere and the related temporary increase in alexithymic tendencies. While the ASA total scores of Japanese adolescents were at a similar level to the alexithymia scores in previous studies [24, 25, 28], the developmental trends of the subscales suggest that the quality of alexithymic tendencies may differ between the early and late teens.

In addition, the alexithymic tendencies of Japanese adolescents consistently showed higher ASA total scores in females than in males. In the subscales, females were found to have significantly higher DIF and DDF, with males exhibiting significantly higher EOT, although these differences were small effect sizes ranged $d = .10-.26$. This is consistent with the results of previous studies. For example, the results of a large-scale survey in Japan (Moriguchi et al., 2007) and the results of a study [6] conducted on Finnish youths showed similar gender differences in terms of DIF and EOT [25]. In a sample of Japanese adolescents, gender differences in terms of DIF and EOT were found to be consistent throughout adolescence and were not affected by development. However, considering that a gender difference in DDF was not found in Moriguchi et al. [6], nor in previous studies with adolescents [24, 25], it is possible that this difference between gender is peculiar to Japanese adolescents.

4.2 Alexithymic tendencies and somatic complaints

The present study examined the effect of alexithymic tendencies on somatic complaints in Japanese adolescents and concluded that alexithymic tendencies have the effect of exacerbating somatic complaints. DIF was found to particularly affect somatic complaints. This result is similar to that of the multiple regression analysis conducted at a primary school by Rieffe et al. [15]. A study of adults [8] also reported that DIF was most strongly associated with somatic complaints. Therefore, the results of the present study support the findings of previous studies.

The main effect of DDF was observed in male students at junior high school and high school students, and no effect was observed in university students. In Rieffe et al. [15], the effects of DIF and DDF were found in primary schools (mean age 11 years), whereas the effects of DIF was mainly identified in secondary schools (mean age 13 years). From this, we can infer that the effect of DDF on somatic complaints is something that disappears as individuals develop. Although DDF was significantly higher in female participants, the effect of DDF on SCL was found mainly in males. This may be because Japanese females tend to more actively disclose when they experience unpleasant emotions and they also try to resolve the problem directly, whereas males are more self-defensive and are less likely to respond directly than females [38–40].

With regards to EOT, while caution is required in interpretation due to insufficient reliability, in the present study, the relationship between EOT and somatic complaints was found only in female participants at high school, suggesting that EOT is a factor that lacks a broad significance in this regard. A study of adults [19] that examined the relationship between alexithymic tendencies, perception of physical disorders, and desired care reported that EOT was significantly higher among those who rarely used outpatient facilities and did not seek psychotherapy than among those who used such facilities and sought psychotherapy more often. While EOT may not directly affect somatic complaints, it may be a factor that exacerbates issues through its effect on subsequent coping behaviors and support needs. Therefore, future studies should examine the indirect effects of EOT on health, including coping behaviors, rather than its direct effects on the senses through physical symptoms and other factors.

5. Conclusions

The results of the present study indicate that Japanese adolescents exhibit relatively strong alexithymic tendencies. Moreover, alexithymic tendencies were associated with self-reported health-related problems, especially relating to difficulty in identifying emotions. Further research is needed to elucidate the relationship between health and emotional cognition issues from a developmental perspective.

Abbreviations

AQC Alexithymia Questionnaire for Children

ASA Alexithymia Scale for Adolescents

DDF Difficulty describing feelings

DIF Difficulty identifying feelings

EOT Externally oriented thinking

SCL Somatic Complaint List

Declarations

Ethics approval and consent to participate

The present research was approved (14-504) by the Research Ethics Review Committee of the Graduate School of Education and Human Development, Nagoya University. The survey was implemented on students from public junior high and high schools with consent from their respective principals and homeroom teachers, and on students from national and private universities who consented to participate in the survey. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Participants were asked to provide their responses following a written explanation detailing the survey procedure, which was provided to them in advance. The homeroom teachers and lecturers also verbally explained that participants would answer anonymously so that individuals could not be identified or analyzed, and that participation was optional.

Availability of data and materials

The dataset supporting the conclusions of this article is included within the article and are also available from the corresponding author on reasonable request.

Competing interests

The authors have no competing interests to report.

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Authors' contributions

All authors were involved in the literature search and in drafting the manuscript. AT was involved in running the statistical analysis. All authors read and approved the final manuscript.

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