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Research article

DIFFERENCES IN YOUNG CHILDREN'S PROBLEM BEHAVIOR, PEER INTERACTION, AND SCHOOL READINESS ACCORDING TO THE PRESENCE OF ATOPIC DERMATITIS SYMPTOMS

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ABSTRACT

This study examined whether there is a difference in children's psycho-social development variables according to the presence of children's atopic dermatitis symptoms, and analyzed the relationship among variables. This study aims to explore the differences in young children's problem behavior, peer interaction, and school readiness according to the presence of atopic dermatitis symptoms and to investigate the relationship among variables. A total of 1502 children whose are aged six years were considered as subject for this study out of which 232 children's had atopic dermatitis symptoms and the remaining 1270 did not have this symptoms. The research instruments were used the children problem behavior scale, peer interaction scale, and school readiness scale. In the research results, it was found that the level of problem behavior internalization and externalization in the children with atopic dermatitis symptoms was higher than that of no-symptom children. Meanwhile, according to the presence or absence of atopic dermatitis symptoms, it was found that there was no difference between peer interaction and preschool school readiness. In addition, the externalization variable of the problem behavior of children with atopic dermatitis symptoms was found to have a negative effect on school readiness, and peer interaction was found to have a positive effect on school readiness. Children with symptoms of atopic dermatitis can be studied advance by taking this study as the basic data for guiding them also for coping the psychological developmental problem.

KEYWORDS: Atopic dermatitis, Internalization of problem behavior, Externalization of problem behavior, School readiness

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INTRODUCTION

Environmental diseases that cause immune system abnormalities such as air pollution including house dust mites, pets (hair), smoking, and fine dust are increasing due to changes in the living environment caused by urbanization and industrialization. Among them, one of the chronic allergic diseases commonly found in childhood is atopic dermatitis. Due to severe itching, scale and erythema leads to the chronic recurrent eczema can cause the Atopic dermatitis.[1] A genetic background, food allergies, immunological abnormalities, skin barrier abnormalities, environmental factors, social factors, and various causative factors such as psychological relationships are the causes of atopic dermatitis. If the symptoms of atopic dermatitis are severe, it has a great influence on emotions, companionships, learning, play, and family relations, which are part of the quality of life.

6.21 million Patients in total were taken in this study that is treated with atopic dermatitis in Korea. Out of the sample taken from the study the patients between the age group 0-19 are 4.1 million and the patients whose age is 20 and over are 21.2 million. 42.6% are under the age of 9 and 18.7% are teens and 11.5% are in the age 20s. When this type of dataset was taken the atrophy patients were more and there was a decrease with age when considered the affected percentage. This was analyzed by a survey conducted by the Korea Health Insurance Corporation,[2] between 2010 and 2015. The reason that there is the large number of people allergic to Childhood is that childhood has not yet completed the development of the

body or maturation of immunity, and that different from the prenatal environment before birth, it is a time when there are many changes in the process of responding to and adapting to various external changes such as environmental exposure after birth, changes in food, and infection. also, atopic dermatitis has no pain or behavioral restrictions, but it is characterized by appearance problems that cause serious psychological conflicts or are chronic and frequently recur. And so, children with atopic dermatitis are very likely to have psychosocial problems. In particular, it is reported that children with moderate severity of atopic dermatitis have more depression, anxiety, and somatization than children who do not. When children are being diagnosed with atopic dermatitis, although their atopic dermatitis is not severe, the degree of anxiety and depression is reported to be higher than that of the children of other study subjects.[3] Also, according to the analysis of children treated for atopic dermatitis, it has been found that children with atopic dermatitis have many symptoms weakening factors such as severe emotional fluctuations and easy exposure to stress. In particular, it was found that timid children were more irritable due to lack of patience for itchiness, and the treatment period took longer due to severe scratching of the itchy area. It is also reported

that it causes growth disorder, sleep disorder, poor learning, and emotional instability.

Aggression, impulsivity than the control group, and attention deficit, are the overt problems that the group of child patients with atopic dermatitis[4,5] behavioral and emotional problems are more severe than healthy children,5 and in particular, attention disorder is known to negatively affect interpersonal relationships and anxiety.[6] In the results of a study by the Korea Health Insurance Corporation and the Korean Academy of Atopic Dermatitis, in the case of atopic dermatitis patients from childhood to old age treated in 2015, it was found that there was a higher correlation in attention deficit hyperactivity disorder (ADHD), autism category disorder (ASD), and conduct disorder than other skin diseases, and that in particular, the incidence of attention deficit hyperactivity disorder (ADHD) in childhood (4-12 years old) was significantly higher than that of the control group, as in.2 On the other hand, Choi et al. reported that when the problem behavior of 24-month children with atopic dermatitis was measured,[7] attention was higher than that of normal children. According to Cheon,[8] in a study of 165 children who had experienced atopic dermatitis aged 5 years old, boys who experienced atopic dermatitis were found to have a higher level of problem behavior than those non-affected children. The same is the case with the girls. But some studies states that the results are opposite to that of the existing studies.

Examining previous studies related to peer interaction of children with atopic dermatitis, positive interactions with peers starting from infancy,[9,10,11] positively affect the development of friendship,[12,13] by learning pro-social behavior and the ability to control one's emotions and behaviors. It is said that many mothers of children with atopic symptoms are concerned about peer teasing and bullying, and that even when they go to elementary school, they are concerned about problems with their friends, but in the case of children without severe atrophy, it has been reported that they do not experience difficulties in friendship, as in.[14,15]

Therefore, this study aims to examine whether there are differences in problem behavior and peer interaction in terms of children's social and emotional development according to the presence or absence of children's atopic dermatitis symptoms, and see if there is any difference in preschool school readiness. Also, this study attempts to analyze the effect of problem behavior and peer interaction on school readiness of young children with atopic dermatitis symptoms. The research questions according to the purpose of this study are as follows.

Research question 1: Are there differences in problem behavior, peer interaction, and school readiness according to the presence of children's atopic dermatitis symptoms?

Research question 2: Do problem behavior and peer interaction of children with atopic dermatitis symptoms affect school readiness?

MATERIAL AND METHODS

Research subjects, research instruments, and data analysis methods are as follows.

Research Subject

1502 children were considered as the subjects for the study out of which 15.4% are children who are affected and remaining 84.6% are not affected. As per the Panel studies conducted in 2014 on Korean children (PSKC) for children born in 2008, by examining the longitudinal development process of domestic children, this study used the 7th year data of 6-year-old children (age of 72-79 months) as shown in table 1.

Table1Research Subjects

Division	Presence of Atopic Dermatitis Symptoms (from birth to present)					
	Presence		Absence		Sum	
	Frequency	%	Frequency	%	Frequency	%
Male	125	53.9	642	50.6	767	51.1
Female	107	46,1	628	49.4	735	48.9
Sum	232	100.0 (15.4)	1270	100.0 (84.6)	1502	100.0 (100.0)

Research instruments

Child behaviour checklist: To measure the Configuration and Reliability of Children Problem Behavior this study used the Children Behavior Checklist 1.5-5 questionnaire (CBCL for Ages 1.5-5)[15], various parameters were considered and estimated as shown below in table 2.

Table 2 Configuration and Reliability of Children Problem Behavior Scale

Measurement variable			Number of items	Reliability
Problem behaviors	Internalization	Emotional responsiveness	13	.74
		Anxiety/depression	8	.72
		Physical symptoms	11	.57
		Shrinking	8	.65
	Externalization	Attention problems	5	.62
		Aggressive behaviors	19	.87
Total			60	.93

Interactive Peer Play Scale

To measure children's peer interaction, this study used the size which Choi & Shin17 validated and reconstructed from the Penn Interactive Peer Play Scale (PIPPS) items developed by Fantuzzo et al.,16 Three sub areas of total 30 items were considered from the Korean Children's Panel (PSKC) survey to estimate the score range and reliability as shown in table 3.

Table 3 Configuration and Reliability of Interactive Peer Play Scale

Measurement Variable		Number of Items	Score Range	Reliability
Peer interaction	Play interaction	9	9~36	0.81
	Interference with play*	13	13~52	0.86
	Play break*	8	8~32	0.89
Total		30	30~120	0.83

School Readiness Scale

As shown in table 4, Four sub factors like attitude toward learning (8 items), cognitive development and public knowledge (5 items), social-emotional development (6 items), and communication (3 items) are the measures for this study that the Korean Children's Panel researchers adapted from Murphey and Burns' school readiness scale.[18]

Table4 Configuration and Reliability of the School Readiness Scale

Measurement Variable		Number of Items	Score Range	Reliability
School readiness	Social-emotional development	6	6~24	0.93
	Attitude toward learning	8	8~32	0.93
	Communication	3	3~12	0.93
	Cognitive development and general knowledge	5	5~20	0.93
Total		22	22~88	

Data Analysis Method

Descriptive statistics analysis was performed using SPSS 25.0 to calculate statistics on the demographic background of the subject, and independent sample t-test was performed to verify the difference between variables. In order to analyze the relationship between variables in young children with atopic dermatitis symptoms, this study performed correlation and regression analysis.

RESULTS

The results of the analysis of the differences and relationship in problem behavior, peer interaction, and school readiness according to the presence of children's atopic dermatitis symptoms are as follows.

The Demographic Characteristics of the Subject

The demographic characteristics of the subject are as follows in terms of the residential area, the region size, and the level of parental education. Looking at the demographic characteristics of 232 young children with atopic symptoms, first, in the case of residential area, 38 children (16.4%) of them lived in Seoul area, 82 children (35.3%) in Gyeonggi/Incheon area, 24 children (10.3%) in Daejeon/Chungjeong/Gang won area, 27 children (11.6%) in Daegu/Gyeongbuk area, 33 children (14.2%) in Busan/Ulsan/Gyeongnam area, and 28 children (12.1%) in Gwangju/Jeolla area. Second, in case of the region size, 103 children lived in big cities (44.4%), 122 children in small and medium-sized cities (52.6%), and 7children in towns and villages, with the largest number of small and medium-sized cities, followed by large cities and towns and villages. Third, as for the level of parental education, in the case of mothers, 94 persons (40.5%)graduated from a four-year university or higher, followed by 65 persons(28.0%) graduates from a junior college, and 52 persons (22.4%) graduated from a high school and less. In the case of fathers, 106 persons (46.1%) graduated from four-year university or higher, followed by 50 persons (21.7%) graduates from junior colleges, 49 persons (21.3%) graduates from high school and less, and 25 persons (10.9%) graduates from graduate school. The number of graduates from junior college or higher was 68.5% for mothers and 78.7% for fathers, indicating that they were relatively highly educated compared to the non-atopic dermatitis group.

Looking at the demographic characteristics of 1270 young children without atopic dermatitis symptoms, first, in the case of residential areas, 146children (11.5%) lived in Seoul area, 391 children (30.8%) in Gyeonggi/Incheon area 171children (13.5%) in Daejeon/Chungjeong/Gangwon area,157 children(12.4%) in Daegu/Gyeongbuk area, 241children (19.0%)in Busan/Ulsan/Gyeongnam area, and 164 children (12.9%) inGwangju/Jolla area Second, in case of the regionsize, 530 children livedin large cities (41.7%), 688 children in small and medium-sized cities (54.2%), and 52 children in towns and villages (4.1%), with the largest number of small and medium-sized cities, followed by large cities and towns and villages. Third, as for the level of parental education, in the case of mothers, 469persons (37.2%) graduated from four-year university or higher, followed by 388 persons (30.8%) graduated from high school or less, and 349 persons (27.7%) graduated from junior college. In the case of fathers, 517 persons (41.3%) graduated from a four-year college or higher, followed by 360 persons (28.7%) graduated from high school or less, 248 persons (19.8%) graduated from junior college, and 127 persons (10.1%) graduated from graduate school as shown in Table 5.

Table 5 the Demographic Characteristics of the Subject

Division		Presence of Atopic Dermatitis Symptoms					
		Presence		Absence		Sum	
		Frequency	%	Frequency	%	Frequency	%
Residential areas	Seoul	38	16.4	146	11.5	184	12.3
	Gyeonggi/Incheon	82	35.3	391	30.8	473	31.5
	Daejeon/Chungjeong/Gangwon	24	10.3	171	13.5	195	13.0
	Daegu / Gyeongbuk	27	11.6	157	12.4	184	12.3
	Busan/Ulsan/Gyeongnam	33	14.2	241	19.0	274	18.2
	Gwangju / Jeolla	28	12.1	164	12.9	192	12.8
	Total	232	100.0	1270	100.0	1502	100.0
Region Size	Big cities	103	44.4	530	41.7	633	42.1
	Small and medium-sized cities	122	52.6	688	54.2	810	53.9
	Towns and villages	7	3.0	52	4.1	59	3.9
	Total	232	100.0	1270	100.0	1502	100.0
Level of mother's education	Graduates from high school or less	52	22.4	388	30.8	440	29.6
	Graduated from junior college	65	28.0	349	27.7	414	27.7
	Graduated from four-year	94	40.5	469	37.2	563	37.7

	university or higher						
	Non-answer	21	9.1	55	4.4	76	5.1
	Total	232	100	1261	100.0	1493	100.0
Level of father's education	Graduates from high school or less	49	21.3	360	28.7	409	27.6
	Graduated from junior college.	50	21.7	248	19.8	298	20.1
	Graduated from four-year university	106	46.1	517	41.3	623	42.0
	Graduated from graduate school	25	10.9	127	10.1	152	10.3
	Total	230	100.0	1252	100.0	1482	100.0

The Presence of Atopic Dermatitis Symptoms in Children's Problem Behaviors Differences

The differences in Children's Problem Behaviors According to the Presence of Atopic Dermatitis Symptoms, is as follows, there were significant differences in emotional responsiveness (t=2.60), anxiety/depression (t=4.64), physical symptoms (t=2.47), and a total score of internalization (t=3.69) (p< 0.05). and there was no difference in shrinking (t=1.96, p< 0.05).

The eye problem (t=3.00), aggressive behavior (t=2.52), and a complete score of externalization (t=2.86) all showed significant differences (p<0.05) as shown in Table 6.

Table 6Differences in Children's Problem Behaviors According to the Presence of Atopic Dermatitis Symptoms

Variables		Presence of Atopic Dermatitis Symptoms (*N*=1499)				*t*
		Presence (*N*=232)		Absence (*N*=1267)		*t*
		M	*SD*	*M*	*SD*	*t*
Internalization	Emotional responsiveness	2.08	2.38	1.65	2.01	2.60*
	Anxiety/ Depression	3.08	2.33	2.32	2.04	4.64***
	Physical symptoms	1.53	1.98	1.20	1.52	2.47*
	Shrinking	1.53	1.64	1.31	1.63	1.96
	Sum	8.22	6.82	6.47	5.82	3.69***
Externalization	Attention problem	1.28	1.32	0.99	1.30	3.00**
	Aggressive behavior	5.29	4.49	4.49	4.42	2.52*
	Sum	6.57	5.39	5.49	5.27	2.86**
Total		23.70	16.66	19.16	15.22	4.12***

*p<0.05. **p<0.01 ***p<0.001

Differences in Children's Peer Interactions according To the Presence of Atopic Dermatitis Symptoms

The play interaction, interference with play, and play break in children's peer interaction showed no difference between children group with atopic dermatitis symptoms and no-symptom children group (p>0.05), as shown in Table 7.This result means that atopic dermatitis symptoms do not affect young children's peer play interactions.

Table7 Differences in Children's Peer Interactions According to the Presence of Atopic Dermatitis Symptoms

Variables	Presence of atopic dermatitis symptoms (*N*=1134)				*t*
	Presence (*N*=173)		Absence (*N*=961)		*t*
	M	*SD*	*M*	*SD*	*t*
Play interaction	3.10	0.43	3.07	0.46	-0.60
Interference with play*	3.91	0.52	3.95	0.49	-0.86
Play break*	4.33	0.61	4.36	0.58	-0.74
Total	3.78	0.40	3.80	0.39	-0.50

* Reverse item

Differences in Children's School Readiness according To the Presence of Atopic Dermatitis Symptoms

The difference in the Children's school readiness determines the presence of atopic dermatitis symptoms (t=-0.74, p>0.05). This result means that atopic dermatitis symptoms do not affect school preparation of young children as shown in Table 8.

Table8 Differences in Children's School Readiness According to the Presence of Atopic Dermatitis Symptoms

Variable	Presence of atopic dermatitis symptoms (*N*=1134)				*t*
	Presence (*N*=173)		Absence (*N*=961)		
	M	*SD*	*M*	*SD*	
School readiness	3.47	0.42	3.49	0.41	-0.74

Effects of the problem behavior and peer interaction on school readiness

Correlation analysis among variables: The results of the correlation analysis between the three variables and the lower variables are as follows. As a result of the correlation analysis, there was a negative correlation between sub-factors of externalization for problem behavior such as attention problem (r=-0.16, p<0.05), aggression behavior (r=-0.19, p<0.05), a total score of externalization (r=-0.20, p<0.01), and the school readiness level.

Therefore, it can be seen that the lower the attention problem, the aggressive behavior, and the externalization level, the higher the school readiness of young children. On the other hand, there was a highly positive correlation between play interaction (r=0.62, p<0.01), play disturbance (reverse items) (r=0.30, p<0.01), play breaking (reverse) (r=0.53, p<0.01), a total score of peer interaction (reverse) (r=0.62, p<0.01), and the school readiness level. Thus, it can be said that the higher the level of peer interaction, the higher the school readiness as shown in Table 9.

Effects of Problem Behavior and Peer Interaction on School Readiness:

The results of the regression analysis were as follows (Table 10). First, children's behaviors and peer interaction were included as independent variables. Among the problem behavioral factors of young children, the externalization (β=-0.20, p<0.01) showed a significant negative effect on school readiness, but the explanatory power was not as large as 4%. On the other hand, the internalization (β=-0.09) and a total score of problem behavior (β=-0.15) did not affect school readiness (p>0.05). Children's peer interaction with atopic dermatitis symptoms significantly influenced school readiness (β=0.62, p<0.001). Peer interaction of young children with atopic dermatitis symptoms accounted for 38% of school readiness.

Table 10 Effects of Problem Behavior and Peer Interaction on School Readiness

Independent Variables		***B***	***SE***	***β***	***t***	***R²***	***F***
Problem behavior	Internalization	-0.01	0.00	-0.09	-1.20	0.01	1.44
	Externalization	-0.16	0.01	-0.20	-2.64*	0.04	6.98**
	Sum	-0.00	0.00	-0.15	-1.95	0.02	3.80
Peer interaction		0.65	0.06	0.62	10.27***	0.38	105.48***

Dependent Variables: School Readiness*$p<0.05$. **$p<0.01$ ***$p<0.001$

(N=230)

Table 9. Correlation Analysis between Problem Behaviors

Variables			1	2	3	4	5	6	7	8	9	10	11	12	13	14
Problem behavior	Internali-zation	1. Emotional responsiveness	1													
		2. Anxiety/Depression	.73"	1												
		3. Physical symptoms	.50"	.48"	1											
		4. Shrinking	.53"	.64"	.38"	1										
		5. A total score of internalization	.87"	.89"	0.72"	.75"	1									
	Externali-zation	6. Attention problem	.52"	.52"	.38"	.41"	.57"	1								
		7. Aggressive behaviour	.66"	.57"	.36"	.42"	.63"	60"	1							
		8. A total score of Externalization	.68"	.61"	.40"	.45"	.67"	.75"	.98"	1						
	Total	9. A total score of problem behaviour	.84"	.84"	.62"	.65"	.92"	.71"	.86"	.88"	1					
Peer interaction		10. Play interaction	-.16"	-.07	-.05	-.10	.12	-.21"	-.18"	-.20"	-.16"	1				
		11. Interference with play	.05	.10	.06	.05	.08	-.14	-.21"	-.21"	-.04	.13	1			
		12. Play break	.04	.10	.11	.00	.08	-.10	-.04	-.06	.04	.35"	.60"	1		
		13. A total score of peer interaction	-.02	.07	.06	-.02	.03	-.18"	-.18"	-.19"	-.05"	.59"	.78"	.89"	1	
School readiness		14. School readiness	-.09	-.06	-.04	-.12	-.09	-.16"	-.19"	-.20"	-.15	.62"	.30"	.53"	.62"	1

*p<0.05. **p<0.01 ***p<0.001

CONCLUSION

This study examined whether there is a difference in children's psycho-social development variables according to the presence of children's atopic dermatitis symptoms, and analyzed the relationship among variables.

In the results of comparing the difference in the problem behavior factors of young children according to the presence or absence of atopic dermatitis symptoms, it was found that there were significant differences in internalization and externalization of problem behavior. The score of problem Behavior of children with atopic dermatitis symptoms was higher than that of no-symptom children.[2, 4, 5] Second, it was reported that children with atopic dermatitis tend to be immature and unsociable compared to healthy children.[4] but in this result, the sub-factors of peer interaction such as play interaction, interference with play, and play break according to

The presence or absence of atopic dermatitis symptoms showed no difference between groups.[8,14]

In the other case of preschool age children w.r.to school readiness it was observed that no difference of atopic dermatitis whether it is present or absent. Thus it leads to the inconsistent results in children's emotional development,[1,9,10] and also inconsistent with the findings that atopic dermatitis negatively affects school-age children's companionship, as

in.[19,20] When peer interaction is considered it shows only minimum effect due to atopic dermatitis.[7]

In order to analyze the relationship between variables in young children with atopic dermatitis symptoms, this study performed correlation and regression analysis. In the results of correlation analysis, as a negative correlation was found between attention problem, aggressive behavior and school readiness, which are children's externalization problem behaviors, there is a need for guidance to lower the level of externalization problem behaviors. Among children's problem behaviors, it was found that internalization factors did not affect school readiness, and that the externalization factor explained the 4% influence on school readiness. Meanwhile, children's peer interaction was found to be an important factor explaining 38% of school readiness. For children aged 6 years old, as it is time to get ready before school age, integrative education and guidance should be provided to increase school readiness by lowering the level of problem behavior and promoting peer interaction, as in.[11,12,18]

In terms of the limitations of the study, first, as the data of the Korean Children's Panel were collected through the ratings of teachers or parents, there is a limitation of not presenting inter-rater reliability in this study. In the future, it seems that there is a need for complementary measures through qualitative research methods. Second, it is necessary to use more biological diagnostic data for methods of diagnosing allergies such as atopic dermatitis. Considering the fact that the studies on atopic dermatitis and children's development work competitively in combination with children's developmental characteristics, immunity, skin conditions, infections caused by bacteria, viruses, and fungi, emotional factors, parental attitudes, and environmental factors work in combination, it is necessary to use big data analysis methods, and conduct a long-term study integrated into real life for child patients with atopic dermatitis as in,Children with symptoms of atopic dermatitis can be studied advance by taking this study as the basic data for guiding them also for coping the psychological developmental problem.

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