

## 말더듬 청소년 및 성인의 국내외 치료 연구 동향

# Trends in Domestic and International Treatment Research in Stuttering Adolescents and Adults

김효정<sup>1</sup>, 장현진<sup>2\*</sup>, 신명선<sup>2</sup>

<sup>1</sup> 고신대학교 언어치료학과 교수

<sup>2</sup> 부산가톨릭대학교 언어청각치료학과 교수

Hyo Jung Kim<sup>1</sup>, Hyun Jin Chang<sup>2\*</sup>, Myung Sun Shin<sup>2</sup>

<sup>1</sup> Dept. of Speech and Language Pathology, Kosin University, Professor

<sup>2</sup> Dept. of Speech-Hearing Therapy, Catholic University of Pusan, Professor

**Purpose:** To collect adolescent and adult stuttering intervention studies published domestically and internationally from 1990 to present, and analyze and consider by the publication time, subject, treatment type, and measurement variables. **Methods:** The study status was identified according to the timing of the studies, subjects, types of treatment techniques, and variables measuring treatment effectiveness. **Results:** The number of stuttering intervention research in adolescents and adults increased in the 2000s, both domestically and internationally, and while the study was maintained abroad until the 2010s, it showed a decreasing trend in Korea. There were no intervention studies on adolescents between the ages of 13 and 18 in Korea, and one study on adolescents and adults was conducted in Korea, and the rest were on adults. There were only four studies on only adolescents abroad but 28 studies on adolescents and adults. There were many speech motor interventions and cognitive approaches in Korea, and in the foreign countries, multi factor interventions were the most frequently followed by feedback and device interventions and speech motor interventions. The most common measurement variable used in the intervention study was speech fluency measurement variable (50.4%) and attitude measurement variable (24.3%). **Conclusions:** This study suggests the need for intervention research in adolescent and adult stuttering therapy, research for adolescents, development of intervention programs, and development and standardization of test tools to measure intervention effectiveness and it is expected that such research will continue in the future.

**Correspondence :** Hyun Jin Chang, PhD

**E-mail :** changhj26@cup.ac.kr

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**목적:** 1990년부터 현재까지 국내외에서 발표된 청소년 및 성인 말더듬 중재 연구들 수집하여 말더듬 증시기별, 대상자별, 중재의 유형별, 결과 측정 변수별로 분석하고 고찰하고자 하였다. **방법:** 연구대상은 1990년부터 현재까지 국내외에서 발표된 청소년 성인 말더듬 치료 연구 72편(국내 13편, 국외 59편)이었다. 대상 연구를 시기에 따라, 대상자에 따라, 치료기법의 유형에 따라, 치료효과를 측정하는 변수에 따라 연구현황의 현황을 확인하였다. **결과:** 청소년 및 성인 말더듬 중재 연구가 2000년대에 국내와 국외에서 증가하였고, 국외에서는 2010년대까지 유지되고 있으나, 국내에서는 감소되는 추세를 보였다. 치료의 대상자별로 분류하였을 때, 국내에서는 13~18세 사이 청소년을 대상으로 한 중재 연구는 없었고, 청소년과 성인을 함께 대상으로 한 연구는 국내에서는 1편, 나머지는 성인을 대상으로 한 연구였다. 국외에서도 청소년을 대상으로 한 연구는 4편으로 적었으나 청소년과 성인을 함께 대상으로 한 연구는 28편으로 많았다. 말더듬 중재의 유형으로는 국내에서는 구어운동 중재와 인지적 접근이 많았고, 국외에서는 다중 요소 중재가 가장 많았고, 다음으로 피드백 및 기기를 이용한 중재와 구어운동 중재가 많았다. 중재연구에서 사용된 측정변수는 구어 유창성 측정변수가 전체 측정변수 중 50.4%로 가장 많았고, 태도적 측정변수가 24.3%였다. **결론:** 본 연구를 통해 국내 청소년 및 성인 말더듬 치료 분야의 중재 연구, 청소년 대상 연구, 중재 프로그램 개발, 중재 효과 측정을 위한 검사도구의 개발과 표준화 등이 필요성을 제시하였고, 향후 이러한 연구가 이어지길 기대한다.

**교신저자 :** 장현진 (부산가톨릭대학교)

**전자메일 :** changhj26@cup.ac.kr

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**검색어 :** 청소년 및 성인 말더듬 중재, 문헌 고찰, 구어운동 중재, 인지적 접근, 다중요소 중재

## I. Introduction

Of fluency disorders, stuttering can begin early in childhood and last through adolescence and adulthood. In the early stages of stuttering, there is no or very weak perception of stuttering, so negative emotions are not strongly formed, but the stuttering symptoms become more complicated and internalized as they progress into adolescence and adulthood (Guitar, 2018). Even if the stuttering frequency is increased or similar, the blockage may be the main type rather than the repetition. In addition, the stuttering people become conscious of the reaction of his peers and colleagues around them and try to avoid stuttering or they may avoid words that are likely to stutter as the anxiety and fear of stuttering grows (Shin et al., 2019a).

As we get older, we have more work to decide, and fluency becomes important. Especially in adolescence when students must maintain their studies or their peer relationships, it is even more important. Adolescents who spend most of their time in school have more opportunities for expression in team discussions and presentations, and these activities can influence future direction of life, so they compete more intensely than ever before. In addition, fluent speech is important not only in business meetings and reports, but also in communication with employees, in adulthood when working life has a significant impact on life. In particular, despite the great efforts to maintain fluency, they may stutter until adolescence and adulthood, and in such cases, involuntary stuttering behaviors are increasingly strengthened, making it difficult to express one's intentions in various communication situations and it makes negative emotions such as anxiety and fear more prominently (Manning, 2010).

Therefore, in order to grasp the essential characteristics of adolescent and adult stuttering, it is necessary to intervene, considering not only the apparent behavioral factors but also the emotional and cognitive characteristics (Guitar, 1998; Shin et al., 2019a)

Adolescent and adult stuttering intervention approaches/techniques include fluency shaping approach, stuttering modification approach, a cognitive restructuring approach, and an integrated approach. Each of these approaches has a different focus. The fluency shaping approach is the practice way to produce speech in an easier and relaxed way to increase fluency. The stuttering modification approach is to treat the stuttering person's anxiety and fears in order to be aware, confront and insensitive, and to modify the stuttering form to a less severe and near-normal form. The cognitive restructuring

approach aims to discover irrational belief systems of stuttering people's words and communication and to transform them into more rational forms. In doing so, the relaxed body produces fluent speech. The integrated approach is a comprehensive approach that the three approaches use together or in turn.

In the field of adult stuttering treatment, the intervention of adult stuttering can be greatly different, depending on which of these stuttering intervention approaches/techniques to be selected, which approach to be appropriate for the subject, and which elements to be placed in which order if multiple approaches are used.

Sub-intervention elements included in the adult stuttering intervention approach can be divided into speech motor interventions, behavioral modification interventions, cognitive emotional aspects, and feedback.

Speech motor interventions include activities such as slow speech, extended speech, light articulation, smooth speech initiation, and speaking in rhythm or rhyme. It is the process of practicing speech production of breathing, speech, resonance, and articulation. These exercises help them continue breathing or talking without stopping.

Behavioral modification intervention is an approach to increase fluency and reduce non-fluency by gradually adjusting the difficulty of speech tasks and by presenting subsequent stimuli to fluent or non-fluent speech of stuttering people by using the behavioral modification principle. In the case of adolescents and adults, it is difficult to establish fluency only by controlling subsequent stimuli, so it is often accompanied with speech motor intervention.

The cognitive emotional aspect mainly deals with the inner aspects of stuttering adolescents or adults. It can be divided into cognitive aspects such as perception, control, efficacy, and communication attitude toward stuttering and emotional aspects such as anxiety and fear learned from the unpleasant experience of stuttering. This approach is a process to help speech control by finding and improving the internal motivation of stuttering behavior.

In the aspect of feedback, it is given by muscle proprioception or auditory during speech. For stuttering people, problems with auditory feedback are discovered, and stuttering can be cured more when blocking, delaying, or tampering the feedback.

In the case of adolescents or adults with stuttering of intermediate or higher stuttering, complete intervention is often difficult with only one technique so that an integrated approach using more than one technique is required. The speech clinician should be able to select the elements of stuttering intervention according to the subject and to

determine the intervention method and order that is most suitable for the subject. Unlike in children, advanced stuttering in adolescence and adulthood should be accompanied by activities to reduce negative emotions and to enhance fluency.

Accordingly, the purpose of this study is to examine the timing, subjects, types, and measurement variables of interventions through written materials related to stuttering interventions for stuttering adolescents and adults at home and abroad. In addition, the intervention target, duration, and measurement variable for each intervention type will be examined. It is hoped that this study will be helpful in the clinical decision making of speech clinicians treating stuttering adolescents and adults.

## II. Research Method

### 1. Procedure

This study was conducted in order of document collection, data extraction by analysis factors, coding, and data analysis to analyze the status of domestic and international studies reporting the intervention effects of stuttering adolescents and adults.

The criteria for selecting thesis are as follows. In case of domestic research, documents that satisfy the selection criteria among the papers derived from the search keyword 'stuttering / fluency + youth / adults + intervention / therapy' in 'Research Information Sharing Service (<http://www.riss.kr>)' were selected. In the case of foreign papers, 126 papers were selected for a systematic review of non-pharmaceutical interventions in stuttering children and adults from 1990 to February 2014, as shown in Baxter et al. (2016), and from 2014 to August 2019, studies matching the selection criteria were selected based on the data searched by entering the keywords 'stutter / fluency' + 'adolescent / adult' + 'intervention / therapy' through Pubmed, PsycINFO, and Google scholar. The search period was one month of August 2019, and the documents were repeatedly extracted during that period.

The selection criteria of the study on stuttering interventions for adolescents and adults are as follows. (1) The study subjects were limited to adolescents or adults. (2) Case studies with one subject were excluded (3 cases, Kim et al., 2004; Ko, 2013; Lee, 2011). (3) In the stuttering intervention approach / technique, studies that reported the effects of medical interventions or general educational activities were excluded. (4) Only one study

was adopted when the same intervention was presented to the same subject multiple times. However, even if it appears to be a similar study, if there is a change in the study subject or the intervention technique, it was adopted as a separate study. Documents that satisfy the above criteria were selected and the data of each element of the paper were extracted and analyzed.

### 2. Analysis

In order to examine the domestic and international status of children's stuttering intervention research from 1990 to the present, the number of domestic and international papers was presented in 10 years for the year in which the research was published.

To divide the subjects into adolescence and adulthood, adolescents were classified into 13-18 years of age, which corresponded to secondary school age, and adulthood was classified into 19 years and older and in the span of adolescence and adulthood, it was classified into the third group.

The types of interventions in adolescent and adult stuttering intervention studies were classified into behavioral modification interventions, speech motor interventions, cognitive emotional interventions, feedback and device-based interventions, and integrated interventions.

The duration of the intervention was extracted according to the format suggested in the study, such as session, time, date, and frequency.

Measurement variables used as dependent variables to verify the effects of adult stuttering intervention were extracted. Intervention effect measurement variables were divided into speech, psychological attitude, behavior, and others. The speech aspect included stuttering frequency, severity, speech speed, non-fluency type, and scores, and the psychological attitude included measuring changes in cognition, emotion, and attitude of the stuttering person.

Frequency and percentage by analysis factor were measured and presented in tables and graphs. In terms of the intervention approach, subjects, duration of intervention, and measurement variables were analyzed.

## III. Results

According to the selection criteria of the study on the effects of adult stuttering intervention, 72 studies (13 domestic and 59 international) were selected. These studies were classified by time, subject, intervention technique, and measurement variable.

### 1. Research on Stuttering Therapy for Domestic and Foreign Adolescents and Adults by Year

The study of stuttering therapy in adolescents and adults was counted by the 10-year period since 1990. In Korea, no intervention studies for adolescents or adults were published in the 1990s, and 10 studies for 10 years from 2000 to 2009 were published and it was the highest number of publication, and 3 papers were published again in the 2010s. Overseas, research has increased from the 1990s to the 2000s as in Korea, and research and publication have continued in the 2010s (Table 1, Figure 1).

표 1. 시기별 청소년 및 성인 말더듬 중재 연구 현황

Table 1. Status of adolescents and adults' stuttering intervention studies by period

Period	Domestic	Foreign	Total
1990-1999	0 (0)	14 (39.0)	14 (19.4)
2000-2009	10 (76.9)	23 (37.3)	33 (45.8)
2010-2019	3 (23.1)	22 (23.7)	25 (34.7)
Total	13 (100)	59 (100)	72 (100)

The values are frequency (percentage).

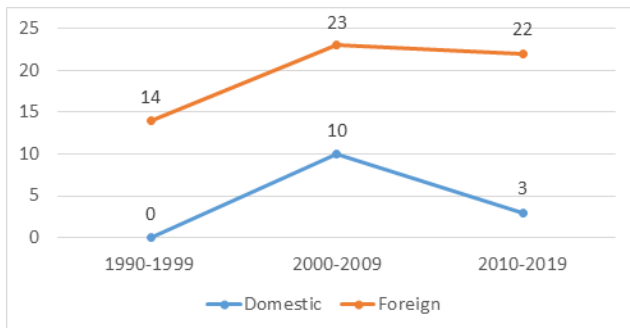


그림 1. 시기별 청소년 및 성인 말더듬 중재 연구 현황

Figure 1. Status of adolescents and adults stuttering intervention studies by period

### 2. Research Status of Stuttering Therapy for Adolescents and Adults by Subjects

The subjects of stuttering therapy were divided into a study of adolescents aged 13-18 years, a study of adults over 19 years old, and a study of adolescents and adults. In Korea, there were no studies on only adolescents and most of the studies were on adult(76.9%). Although only 6.8% of overseas studies were conducted on adolescents, 47.5% of the studies conducted interventions on both of adolescents and adults, and 25.4% of the studies were

conducted on adults over 19 years old. It was found that there were relatively few interventions targeting only stuttering adolescents at home and abroad.

표 2. 대상자의 연령대별 청소년 및 성인 말더듬 중재 연구 현황

Table 2. Status of adolescents and adults stuttering intervention studies by age group

Subjects	Domestic	Foreign	Total
Adolescents (13-18 years old)	0 (0)	4 (6.8)	4 (5.6)
Mix	1 (7.7)	28 (47.5)	29 (40.3)
Adults (≥19 years old)	10 (76.9)	15 (25.4)	25 (34.7)
Unclear	2 (15.4)	12 (20.3)	14 (19.4)
Total	13 (100)	59 (100)	72 (100)

The values are frequency (percentage).

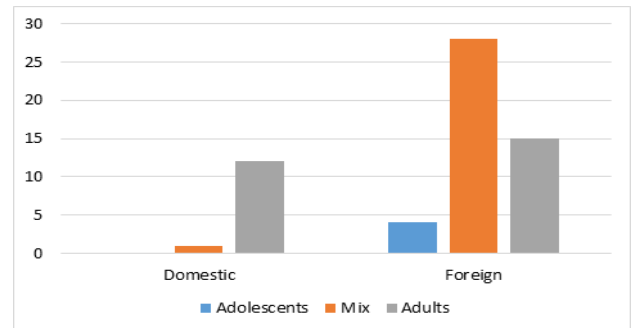


그림 2. 대상자의 연령대별 청소년 및 성인 말더듬 중재 연구 현황

Figure 2. Status of adolescents and adults stuttering intervention studies by age group

### 3. Research on Stuttering Therapy of Domestic and Foreign Adolescents and Adults by Type of Intervention

Stuttering therapy studies conducted on adolescents and adults at home and abroad were classified by the type of intervention. The research status of behavioral modification interventions, speech motor interventions, feedback and technology interventions, cognitive interventions, and multifactor interventions are shown in Table 3.

The largest number of studies published in Korea were five speech motor interventions and four cognitive interventions, and there were two intervention papers using feedback and two multifactor intervention papers. In the study published abroad, multifactor intervention was 48.3%, the most common, feedback-based intervention was 27.1%, and speech motor intervention was 25.4%. In addition, cognitive intervention was 3.4% and behavioral modification intervention was 1.7%.

표 3. 청소년 및 성인 말더듬 중재 유형별 연구 현황

Table 3. Research status by type of adolescents and adults stuttering intervention

Intervention type	Domestic	Foreign	Total
Behavioral modification interventions	0 (0)	1 (1.7)	1 (1.4)
Speech motor interventions	5 (38.5)	15 (25.4)	20 (17.1)
Feedback and technology interventions	2 (15.4)	16 (27.1)	18 (25.0)
Cognitive interventions	4 (30.8)	2 (3.4)	6 (8.3)
Multi-component interventions	2 (15.4)	25 (48.3)	27 (37.5)
Total	13 (100)	59 (100)	72 (100)

The values are frequency (percentage).

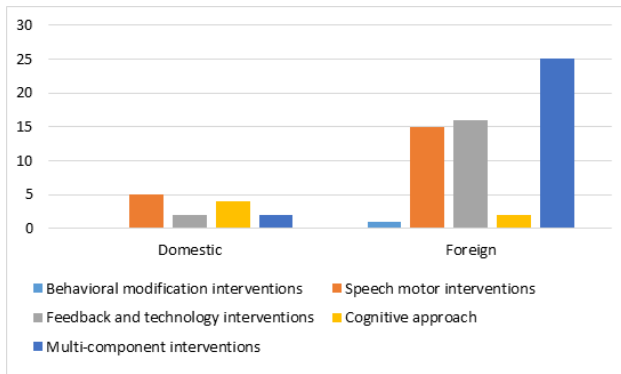


그림 3. 청소년 및 성인 말더듬 중재 유형별 연구 현황

Figure 3. Research status by type of adolescents and adults stuttering intervention

The intervention study was divided into specific types and it is shown in Table 3. If more than one intervention was used in a study, each intervention was included in the frequency. There was only one behavioral modification intervention for adolescents and adults, and the detailed therapy technique was intervention using timeouts and follow-up stimuli. Speech motor intervention has been studied using Prolonged speech technique (7), Camperdown program (6) and Smooth Speech technique (6), and there were other Rhythmic Speeches (2), Relaxation/hypnosis (3), and Adronian Speech (2), which is a new speech approach.

In the feedback and device-based interventions, the study on controlling auditory feedback such as DAF and FAF was the most, and there were other studies using EMG or Masker.

Cognitive interventions included Acceptance and Commitment Therapy, Mindfulness, Personal Construct

Psychology (PCP), Narrative Therapy, and Gestalt Therapy.

In multifactor intervention, Cognitive-Behavior Therapy (CBT) was the most with 8 papers and 5 Comprehensive Stuttering Program (CSPs) and 1 Successful Stuttering Management Program (SSMP) were published.

표 3. 청소년 및 성인 말더듬 중재 세부유형별 연구 현황

Table 3. Research status by type of adolescents and adults' stuttering intervention

Intervention type	Domestic	Foreign	Total
Behavioral modification interventions			
Time-out, consequence stimulus	-	1	1
Speech motor interventions			
Prolonged speech	3	4	7
CP (Camperdown Program)	-	6	6
Smooth speech	1	4	5
Rhythmic speech	2	-	2
MPI (Modified Phonation Intervals)	-	3	3
Webster's Precision Fluency Shaping Program	-	1	1
Adronian speech	2	-	2
Speech restructuring thechnique	-	2	2
Relaxation/hypnosis	1	2	3
Feedback and technology interventions			
DAF/FAF/AAF/Speech easy	2	14	16
EMG (Electromyography)	-	2	2
Masker	-	1	1
Cognitive approach			
ACT (Acceptance and Commitment Therapy)	1	1	2
Mindfulness	-	2	2
PCP (Personal Construct Psychology)	-	2	2
Narrative therapy	1	-	1
Gestalt therapy	-	1	1
Multi-component interventions			
CBT (Cognitive-Behavior Therapy)	1	7	8
CSP (Comprehensive Stuttering Program)	-	5	5
SSMP (Successful Stuttering Management Program)	-	1	1
Intensive program	-	5	5
Others	1	6	7
Total	15	70	85

#### 4. Research Status of Stuttering Therapy for Domestic and Foreign Adolescents and Adults by Measurement Variable

The dependent variables of the study used to measure the effects of adolescent and adult stuttering interventions were divided into speech factor, psychological attitude factor, behavioral factor, and others. The speech fluency measurement variable was 195.8%, the psychological attitude related measurement variable was 94.4%, the behavioral measurement variable was 18.1%, and the other measurement variables were 80.5%. The highest

rate of measurement variable used to measure the effect of therapy in adolescent and adult stuttering interventions was found to be speech fluency factor, and about 2 speech fluency measurement variables were used per study. In addition, one psychological attitude measurement variable was used per study.

The highest frequency of speech fluency measurement variables was stuttering frequency, followed by speech rate and speech naturalness, and there were other evaluations using stuttering duration, severity of stuttering, and stuttering pattern.

The highest percentages of psychological attitude measurement variables were used in this order: Communication Attitude Test, Perceptions of Stuttering Inventory (PSI), Self-efficacy Scaling by Adult Stutterers (SESAS), and anxiety tests.

표 4. 청소년 및 성인 말더듬 중재 연구에 나타난 측정변수

Table 4. Measurement variables in the study of adolescents and adults stuttering intervention

Category	Intervention type	Total
Speech fluency	Frequency (%SS, %SW, SW/M)	69 (95.8)
	Speech rate (SPM, WS/M)	24 (33.3)
	Naturalness	17 (23.6)
	Duration	11 (15.3)
	Severity rating	10 (13.9)
	Type of stuttering	10 (13.9)
	Sub-total	141(195.8)
Attitudes	Communication attitude	17 (23.6)
	PSI	13 (18.1)
	SESAS	11 (15.3)
	Anxiety	11 (15.3)
	LCB	7 ( 9.7)
	OASES	3 ( 4.2)
	SSC	2 ( 2.8)
	Depression	2 ( 2.8)
Quality of life	2 ( 2.8)	
Sub-total	68 (94.4)	
Behaviors	Physical concomitant	13 (18.1)
Others	Questionnaire, satisfaction, treatment frequency etc.	58 (80.5)
Total		280(388.9)

The values are frequency (percentage).

PSI=Perceptions of Stuttering Inventory; SESAS=Self-efficacy scaling by adult stutterers; LCB=Locus of control of behaviour; OASES=Overall Assessment of the Speaker's Experience of Stuttering Questionnaire; SSC=Speech Situation Checklist.

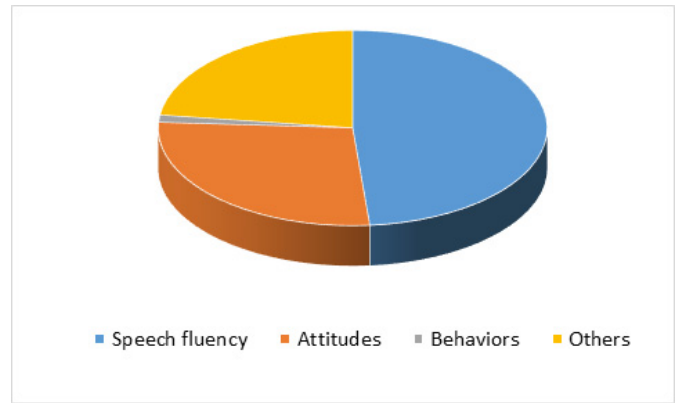


그림 4. 청소년 및 성인 말더듬 중재 연구에 나타난 측정 변수

Figure 4. Measurement variables in the study of adolescents and adults stuttering intervention

#### IV. Discussion and Conclusion

This study examined the papers that published on intervention effects for adolescents and adults who stutter since 1990. A total of 72 studies were selected and analyzed in this study and they are composed of 13 domestic and 59 overseas papers.

The current status of the study over time has been more active in both adolescent and adult stuttering interventions in the 2000s than in the 1990s. The number of overseas studies remained similar in the 2010s, but in Korea, the number of researches decreased rapidly. This was similar to the results of Kim's (2019) study on child stuttering intervention. A total of 13 studies on stuttering interventions for adolescents and adults published in Korea for about 30 years since 1990 have been conducted, and even though two studies were excluded because of one study subject, the number of papers was 15 and it is very small number. Even if the stuttering intervention approach/technique is introduced and applied through foreign papers, it is necessary to continuously study whether Korean subjects have the same effect in Korean language and culture. For the evidence-based intervention approach, which has been recently emphasized, studies on the effectiveness of interventions need to be actively conducted.

In the case of research by study subjects, there were no studies on stuttering adolescents between 13 and 18 years old in Korea, and most of them were on adults over 19 years old. Outside of the country, 47.5% of the studies were conducted on adults, including adolescents, 25.4% of the annual studies were conducted on adults only, and 6.8% were on adolescents only. Adolescents communicate in their

home or school environment which are different from the communication environment that adults face. In addition, in adolescence, general anxiety, social anxiety, communication-related anxiety, and school anxiety may affect stuttering (Shin et al., 2019a). An intervention study considering the psychological attitudes of adolescents is also needed in Korea.

The stuttering intervention approach / technique used in this study was grouped into similar techniques. In Korea, speech motor interventions were the most common (38.5%), the cognitive approach was 30.8%, feedback device intervention and multifactor intervention were 15.4%, respectively. In the case of overseas, multifactor interventions accounted for 48.3%, and feedback devices and speech motor interventions were 27.1% and 25.4%, respectively. Although there is a difference in the ratio between domestic and foreign countries, the cognitive approach is relatively high in Korea, and multifactor intervention is relatively high in other countries. In Korea, cognitive interventions such as proprioceptive immersion therapy, gestalt therapy, and self-promoting therapy focus on cognitive aspects, but they also deal with speech fluency at some stages. Similarly, overseas multifactor interventions deal with cognitive aspects in terms of weight similar to speech fluency. Although there was a difference in the weight ratio, when combined with speech fluency and cognitive interventions, the proportion was highest at 46.2% in Korea and 51.7% in foreign countries. Compared to 18.3% of the multifactor interventions in the childhood intervention study of Kim & Shin (2019), the cognitive aspect is emphasized in the stuttering interventions of adolescents and adults.

When dividing adolescent and adult stuttering intervention into detailed types, the most commonly used technique was an intervention study using DAF or speech easy as a feedback device. It was followed by cognitive behavioral therapy (CBT), extended speech technique, Camperdown program (CP), smooth speech technique, and Comprehensive Stuttering Program (CSP).

A characteristic part of adolescent and adult stuttering therapy is therapy using feedback device, which has fewer therapy sessions in the therapy room than most other intervention techniques, and most of them are wearing devices and intervention in daily life. Also, CP programs were often implemented in the form of self-therapy through video self modeling (VSM). In addition, there were many interventions such as the Comprehensive Stuttering Program or the Intensive Program that visited the therapy room as a check for maintenance after undergoing intensive

speech fluency and cognitive training for a certain period of time. Due to the characteristics of adolescents and adults, the type of intervention was operated differently from child therapy. If the stuttering intervention approach / technique of this type (self-therapy through video self-modeling, self-therapy using device, intensive therapy such as camp) is developed and provided in Korea, it can be effectively used in clinical field.

The measurement variables mainly used in the study to verify the effectiveness of stuttering interventions in adolescents and adults, were analyzed. The speech fluency measurement variable was 195.8%, and about 2 speech fluency measurement variables were used per study. The frequency of stuttering, a representative measurement variable of speech fluency, was 95.8%, and most of the studies examined whether the stuttering frequency was improved to determine the effect of intervention. Most studies have shown that one or more of speech speed, speech naturalness, duration, and stuttering type are used for a parameter to complement the stuttering frequency. Severity rating was 13.9% when therapist or subject simply measured the rating scale. It was found that the stuttering frequency is still the most used to examine the effects of stuttering intervention. However, in order to measure the stuttering frequency, there are disadvantages in that it takes a complicated procedure such as measuring the total number of syllables / words, and counting the frequency of stuttering, and a simple measurement system to replace it is needed. On the other hand, in the case of a severity rating scale, the procedure is simple, but less objective due to the deviation between the evaluators. It is necessary to develop a relatively simple and reliable stuttering evaluation system.

The second measurement variable that validates the effectiveness of stuttering intervention is the variable that measures psychological attitudes. Test tools such as Perceptions of Stuttering Inventory (PSI), Self-efficacy scaling by adult stutterers (SESAS), Locus of control of behavior (LCB), Overall Assessment of the Speaker's Experience of Stuttering Questionnaire (OASES), and Speech Situation Checklist (SSC), were used to measure. Since cognitive aspects are emphasized in adolescent and adult stuttering interventions, it seems that tools for examining psycho-attitude aspects were used to identify changes in these aspects. As standardization of test tools for measuring these psychological attitudes is being implemented in Korea, it is expected that standardized test tools can be used in clinical practice.

Through the analysis and review of stuttering

intervention research published at home and abroad, the necessity of intervention research in the field of stuttering therapy in Korea, the necessity of research for adolescents, the necessity of development of intervention program, and the analysis of the test tool to measure and analyze the effect of intervention were identified for the need of development and standardization. Through this study, the direction for the development of the field of stuttering therapy for adolescents and adults is suggested.

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부록 1. 청소년 및 성인 말더듬 중재 유형별 연구 현황

Appendix 1. Research status by type of adolescents and adults stuttering intervention

Study	Subjects	Sample size (Male: Female)	Intervention / Aims	Independents
(1) Behavioral modification interventions – 1 papers				
Franklin et al. (2008)	Mixed	60	Time out response contingencies	%SS, Number of syllables stuttered and spoken fluently, Total percentage of word and part-word repetitions (%WPWR)
(2) Speech motor interventions – 20 papers				
Block et al. (2005)	Mixed	80(68:14)	A prolonged speech intervention	%SS, S-24, LCB, speech naturalness
Block et al. (2006)	Mixed	80(68:14)	A prolonged speech intervention	%SS, S-25, LCB, speech naturalness
Carey et al. (2010)	-	40	Tele-health delivery of the Camperdown Program	%SS, contact hours, speech naturalness, self-reported stuttering severity, treatment satisfaction
Cocomazzo (2012)	Adults	12(10:2)	Camperdown Program	%SS, speech naturalness
Cream et al. (2009)	Adults	12(8:4)	Speech restructuring technique	%SS, self-reported severity ratings, speech naturalness
Cream et al. (2010)	Mixed	89	Smooth speech P/G, CP P/G, video self modeling (VSM)	%SS, self-rated anxiety, self-rated stuttering severity, avoidance, satisfaction with fluency, quality of life
Franken et al. (1992)	Mixe	32	Webster’s Precision Fluency Shaping Program	%SS, syllables per second, listener rating scales (3 dimensions - distorted speech, dynamics/prosody voice)
Ingham et al. (2013)	Adults	30(17:5)	Modifying Phonation Intervals and Prolonged Speech P/G	%SS, stutter-free SPM, speech naturalness, PET scan
Ingham et al. (2001)	-	5	Modifying Phonation Intervals a computer-based P/G	%SS, stutter-free SPM, speech naturalness, Target range phonation interval frequency
Iverach et al. (2009)	Mixed	64(51:13)	Smooth speech P/G, Camperdown Program, DVD self-intervention	Computerized Version of the Composite International Diagnostic Interview, The International Personality Disorder Examination Questionnaire, %SS, self-rated stuttering severity, self-reported avoidance of speaking situations
O’Brian et al. (2003)	Mixed	30(221:9)	Camperdown Program	%SS, SPM, speech naturalness, self-report inventory
O’Brian et al. (2008)	Adults	10(8:2)	Tele-health adaptation of the Camperdown Program	%SS, SPM, speech naturalness, self-report inventory

Study	Subjects	Sample size (Male: Female)	Intervention / Aims	Independents
Onslow et al. (1996)	Mixed	18(15:3)	Prolonged speech P/G	%SS, SPM, speech naturalness
Park (2016)	Mixed	10	Slowed speech, whispering, rhythmic speech, choral reading, masking	stuttering frequency, speech rate, accompanied behavior score
Choi (2011)	Adults	3	Adronian Speech Technique	SW/M, stuttering type, speech rate, concomitant behavior
Lee (2008)	Adults	3	Intonation-rhythm Therapy Program	SW/M, stuttering type, speech rate,
Kwon (2007)	Adults	20(19:1)	Prolongation, Adronian Speech Technique	Controlled fluency frequency, stuttering frequency
Lee (2004)	Adults	3(0:3)	Slowed speech	Frequency, type, concomitant behavior
Ingham et al. (2015)	-	27	Modifying Phonation Intervals (MPI)	-
Erickson et al. (2016)	-	20	Clinician-free internet speech restructuring treatment	Frequency of stuttering
(3) Feedback and technology interventions – 18 papers				
Antipova et al. (2008)	청+성	8	DAF/FAF	Stuttering frequency, Lidcombe Behavioural Data Language (LBDL) to identify stuttering moments
Armson et al. (1998)	Adults	12(10:2)	AAF/DAF/FAF	% stuttering, speech rate
Armson et al. (2006)	-	13	SpeechEasy	% stuttering
Armson et al. (2008)	Mixed	31(20:11)	SpeechEasy	self-rating of stuttering severity, stuttering frequency, speech rate, speech naturalness
Block et al. (1996)	Mixed	18(14:4)	Edinburgh Masker	%SS, speech rate, speech naturalness
Bray & James (2009)	Adults	5(3:2)	DAF	Wright and Ayre stuttering self rating profile, speaking task response questionnaire, stuttering frequency, naturalness
Foundas et al. (2013)	Adults	24	SpeechEasy	Stuttering rate
Hudock & Kalinowski, (2014)	Adults	9(8:1)	DAF/FAF	Total spoken and total stuttered syllables
O'Donnell et al. (2008)	Adults	7(5:2)	SpeechEasy	PSI, self rated severity, S-24, views of the device and frequency of use

Study	Subjects	Sample size (Male: Female)	Intervention / Aims	Independents
Pollard et al. (2009)	Mixed	12(6:6)	SpeechEasy	SSI, %SS, OASES, PSI
Stidham et al. (2006)	Mixed	10(8:2)	DAF(Bone conduction device)5-130ms	SSI
Unger et al. (2012)	Mixed	30(23:7)	DAF, FAF	%SS, SPM, frequency of repetitions, prolongations, blocks, SSI
Van Borsel et al. (2003)	Mixed	9(4:5)	DAF	%SS
Zimmerman et al. (1997)		9(6:3)	AAF, DAF, FAF	Stuttering episodes (divided by total number of syllables)
Hancock et al. (1998)	Adolescents	97	EMG feedback, intensive smooth speech, home-based smooth speech	%SS, SPM, speech naturalness, Stait-Trait Anxiety Inventory for Children, Communication Attitude Test-Revised
Cho et al. (2006)	Adults	6	SpeechEasy	SW/M, stuttering type, speech rate, S-24
Chang et al. (2009)		10	SpeechEasy	Stuttering frequency, stuttering type
Ritto et al. (2016)	Adults	11(10:1)/ 7(6:1)	SpeechEasy, fluency promotion protocol	Stuttered syllables
(4) Cognitive interventions – 6 papers				
Beilby et al. (2012)	Adults	20(10:10)	Integrated acceptance and commitment therapy	Stuttered speech frequency, OASES, questionnaire, mindful scales
De Veer et al. (2009)	-	37(29:8)	Mindfulness-based Stress Reduction Program	Perceived Stress Scale, Speech Situation Checklist, PSI, SESAS, S-Scale, LCB
Leahy & Collins (1991)	Adults	5	Kelly's personal construct theory	SSI, self-character sketch, situations grid
Ko (2007)	Adults	4(3:1)	Gestalt therapy	%SS, duration, SESAS, S-24
Ko et al. (2009)	Adults	1(0:1)	Narrative therapy	State Anxiety Inventory, stuttering frequency
Heo (2015)	Adults	4	Acceptance and commitment therapy	SW/M, Psychological Well-being Scale, Acceptance & Action Questionnaire-16, SESAS,
(5) Multi-component interventions– 27 papers				
Jeon (2005)	Adults	9	Self-enhancement therapy	%SS, stuttering type, speech rate, PSI, SESAS, S-24, self-concepts

Study	Subjects	Sample size (Male: Female)	Intervention / Aims	Independents
Allen (2011)	Adults	16(14:2)	Blending speech modification techniques and counselling support	Number of emails sent, content of emails, outcome of therapy
Blomgren et al. (2005)	Mixed	19(15:4)	SSMP (Successful Stuttering Management Program)	SSI, PSI, LCB, Beck Depression Inventory, Multicomponent Anxiety Inventory IV (MCAI-IV), State-Trait Anxiety Inventory
Blood (1995)	Adults	4	Behavioural cognitive treatment program	%SS, SPM, SSI, Personal Report of Communication Apprehension scale, Assertiveness Scale, SESAS, S-24
Hasbrouck (1992)	Mixed	117	Comprehensive Stuttering Programme	Mean number of stutterings, number of words, %SW, mean number of WPM
Huinck et al. (2006)	Mixed	25(17:8)	Comprehensive Stuttering Programme (fluency enhancing techniques, tension, and stuttering modification techniques, and cognitive behavioral strategies)	Nijmegen Speech Motor Test, naturalness, SSI, PSI, Inventory of interpersonal situations, %SS, SSC-DS, SSC-ER Speech satisfaction rating scale, S-24
Irani et al. (2012)	Adults	7(5:2)	Fluency shaping, stuttering modification approaches, CBT	LCB, S-24, OASES, %SS, type of dysfluency, secondary behaviours, SSI
Kaya & Alladin (2012)		59	Hypnotherapy, abdominal weightlifting training	Stuttering scale (10-point scale)
Kaya (2011)		93(79:14)	Hypnosis intervention	Stuttering scale (10-point scale)
Langevin & Boberg (1993)	Mixed	10(8:2)	CSP (Comprehensive Stuttering Program)	%SS, SPM, S-24, PSI, SESAS, speech performance questionnaire
Langevin & Boberg (1996)	Mixed	4	CSP (Comprehensive Stuttering Program)	%SS, SPM, S-24, PSI, SESAS
Langevin et al. (2006)	Mixed	25(17:8)	CSP (Comprehensive Stuttering Program)	%SS, SPM, speech naturalness, S-24, PSI, SESAS, speech performance questionnaire
Langevin et al. (2010)	Mixed	18(14:4)	CSP (Comprehensive Stuttering Program)	%SS, SPM, S-25, PSI, SESAS, speech performance questionnaire
Menzies et al. (2008)	Mixed	30(25:5)	Cognitive-Behavior therapy package	%SS, multi-axial psychiatric interview, DSM-GAF scale, clinical assessment of social anxiety, Social Phobia Anxiety Inventory Fear of Negative Evaluation Scale, Social Avoidance and Distress Scale, Beck Anxiety Inventory, Beck Depression Inventory-II, Unhelpful Thoughts and Beliefs About Stuttering (UTBAS) measure
Reddy et al. (2010)	Mixed	5(5:0)	CBT intervention	SSI, PSI, Beck's Anxiety Inventory, Dysfunctional Attitude Scale, Fear of Negative Evaluation, Assertiveness Scale, Rosenberg's Self-Esteem Scale, WHO Quality of Life Scale
Stewart (1996)	Mixed	12(11:1)	Group intervention (attitude change sessions and technique sessions)	WS/M, %SW, SW/M, SSI, S-24



Study	Subjects	Sample size (Male: Female)	Intervention / Aims	Independents
Craig et al. (2002)	Adolescents	6	Smooth speech, EMG, self-management skill, cognitive techniques, physical relaxation	%SS, speech naturalness, State-Trait anxiety Inventory for Children, Communication Attitude Test-revised
Hancock & Craig (2002)	Adolescents	12(11:1)	Smoothspeech, EMG, CBT	%SS, speech naturalness, SPM, State-Trait anxiety Inventory for Children, Communication Attitude Test-revised, Perceptions of Control scale
Lawson et al. (1993)	Adults	15(11:4), 19(14:5)	Avoidance reduction and block modification, PCP (personal construct psychology)	PSI, speech rate, %SS
Nilsen & Ramberg (1999)	Adolescents	13(11:2)	Intensive programme	Rating of severity by independent listener (SLT), Rating of severity by therapist (VAS), Social skills evaluation, LCB
Kim (2003)	Adults	6(5:1)	Group therapy (relaxation, avoidance reduction)	%SW, speech rate, S-24, LCB, PSI, SESAS
Chang (2005)	Adults	3	CBT	SW/M, stuttering type, self-esteem, SESAS
Lu et al. (2017)		13	Behavioral intervention	Brain activation
Helgadóttir et al. (2014)		14	Standalone Internet CBT treatment	Social anxiety, common unhelpful thoughts related to stuttering, quality of life, stuttering frequency
Fry et al. (2013)	Adults	3	Intensive treatment programme	%SS, SEA-scale, Fear of Negative Evaluation (FNE) Scale, Wright and Ayre Stuttering Self-Rating Profile (WASSP), LCB
Gupta et al. (2016)	Adults	10	CBT combined mindfulness (MT)	Toronto Mindfulness scale (TMS), S-24, WHO Quality of Lif-BREF scale, Beck Anxiety Inventory (BAI), Rosenberg Self-Esteem Scale (RSES), PSI, SSI-3
Menzies et al. (2016)		47	CBT Psych (individualized, fully automated, standalone Internet treatment program)	Ssocial anxiety scale