ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE
DİL VE KONUŞMA TERAPİSİ / SPEECH AND LANGUAGE THERAPY

ATLJM 2024; 4 (10): 87-94
https://doi.org/10.54270/atljm.2024.58

AN INVESTIGATION OF TURKISH SPEECH AND LANGUAGE THERAPISTS' THOUGHTS ON ALTERNATIVE AND AUGMENTATIVE COMMUNICATION SYSTEMS

AYŞE NUR KOÇAK[1], HANDAN ÇETİNKAYA[2], RUVEYDA NUR BENİZ[2], AYŞE NUR KARATEKİN[2]

ABSTRACT

Purpose: Speech and language pathologists (SLP) are the primary authorities for preparing and teaching alternative and augmentative communication systems (AAC). This study aims to find Turkish SLPs' thoughts about AAC systems.
Methods: The research was carried out with the Alternative and Augmentative Communication Knowledge Questionnaire (AACQ). This questionnaire was developed by the researchers by reviewing the literature. AACQ contains three parts, a) Demographic questions, b) 17 items about AAC & and c) Two open-ended questions about the AAC. For this study, 45 SLPs participated.
Result: AACQ scores differ statistically and significantly according to the group that uses AAC in clinical settings (p=.003<.05). It was observed that 80% of the participants were not comfortable using AAC. The participants only gave five different AAC examples. The examples were mostly low-tech and unaided AAC systems. Also, the most given example is "Communication Board" with 32.94%, which is a low-tech device. 82.2% of the SLPs want to use AAC, but a) lack of knowledge about AAC, b) insufficient materials c) families' negative thoughts d) discomfort of SLPs while using the AACs were barriers to this process.
Conclusion: In this study, it was found that SLPs had limited knowledge and awareness about AAC systems. But they also have different barriers to using AAC. There is a need to develop materials compatible with Turkish culture and language. To improve that, it is important to conduct investigations into the AAC systems of the Turkish SLPs. In addition, there is a need to improve AAC education in undergraduate lectures in SLP education. With this development, it is thought that Turkish language specific AAC varieties can be kept up to date. With this development, it is thought that Turkish language specific AAC varieties can be kept up to date.
Keywords: alternative and augmentative communication systems, speech and language pathologist, descriptive research

ÖZET

TÜRK DİL VE KONUŞMA TERAPİSTLERİNİN ALTERNATİF VE DESTEKLEYİCİ İLETİŞİM SİSTEMLERİ HAKKINDAKİ DÜŞÜNCELERİNİN İNCELENMESİ

Amaç: Dil ve konuşma terapistleri (DKT), alternatif ve destekleyici iletişim sistemlerinin (ADİS) hazırlanması ve öğretilmesinde birincil yetkililerdir. Bu çalışma Türk dil ve konuşma terapistlerinin ADİS sistemleri hakkındaki düşüncelerini incelemeyi amaçlamaktadır.
Yöntem: Araştırma, araştırmacılar tarafından geliştirilen "Alternatif ve Destekleyici İletişim Sistemleri Bilgi Anketi (ADİSBA)" ile gerçekleştirilmiştir. ADİSBA, a) Demografik sorular, b) ADİS ile ilgili 17 madde ve c) ADİS hakkında iki açık uçlu soru olmak üzere üç bölümden oluşmaktadır. Bu çalışmaya 45 DKT katılmıştır.
Bulgular: Klinik ortamda ADİS kullanan katılımcıların, kullanmayanlara göre ADİSBA skorları istatistiksel olarak anlamlı farklılık göstermektedir (p =,003 <,05). Katılımcıların %80'inin ADİS kullanımında rahat olmadığı görülmüştür. Katılımcıların ADİS örnekleri incelendiğinde, katılımcıların sadece beş farklı ADİS örneği verebildiği görülmüştür. Katılımcıların verdiği ADİS örneklerinin çoğunluğunu düşük teknolojili ve yardımsız sistemler oluşturmaktadır. Ayrıca katılımcıların, %32,94 oran ile en çok verdikleri örneğin düşük teknolojili bir system olan "İletişim Tahtası" olduğu gözlemlenmiştir. DKT'lerin %82,2'si ADİS kullanmak istemektedir ancak a) ADİS hakkında bilgi eksikliği, b) materyal yetersizliği, c) ailelerin olumsuz düşünceleri d) DKT'lerin ADİS'leri kullanırken rahat olmamaları bu sürecin önündeki engellerdir.
Sonuç: Bu çalışmada DKT'lerin ADİS konusunda bilgi ve farkındalıklarının düşük olduğu belirlenmiştir. Katılımcıların verdikleri örneklerin sınırlı olması, destekli öğrenme sistemlerinin Türkiye'de yeterince bilinmediğini göstermektedir Ancak, DKT'lerin ADİS'i klinik ortamda tercih etmemelerine yönelik farklı nedenleri bulunmaktadır. Türk kültürü ve diliyle uyumlu materyallerin geliştirilmesine ihtiyaç vardır. Bunu geliştirmek için, DKT'lerin ADİS sistemlerine yönelik araştırmalar yapması oldukça önem taşımaktadır. Ayrıca, DKT lisans eğitiminde ADİS ile ilgili verilen eğitiminin geliştirilmesine ihtiyaç bulunmaktadır. Bu gelişme ile Türkçe diline özgü ADİS çeşitlerinin güncel tutulabileceği düşünülmektedir.
Anahtar kelimeler: alternatif ve destekleyici iletişim sistemleri, dil ve konuşma terapistleri, betimleyici araştırma

[1]İSTANBUL ATLAS ÜNİVERSİTESİ, SAĞLIK BİLİMLERİ FAKÜLTESİ, DİL VE KONUŞMA TERAPİSİ BÖLÜMÜ, İSTANBUL, TÜRKİYE
[2]İSTİNYE ÜNİVERSİTESİ, SAĞLIK BİLİMLERİ FAKÜLTESİ, DİL VE KONUŞMA TERAPİSİ BÖLÜMÜ, İSTANBUL, TÜRKİYE

KOCAK AN, CETINKAYA H, BENİZ RN, KARATEKİN AN. AN INVESTIGATION OF TURKISH SPEECH AND LANGUAGE THERAPISTS' THOUGHTS ON ALTERNATIVE AND AUGMENTATIVE COMMUNICATION SYSTEMS. ATLJM. 2024;4(10): 87-94.

* THE ABSTRACT OF THIS RESEARCH WAS PRESENTED AS AN ORAL PRESENTATION AT THE "16TH ANNUAL INTERNATIONAL CONFERENCE ON LANGUAGES & LINGUISTICS"

Sorumlu Yazar: AYŞE NUR KOÇAK
İSTANBUL ATLAS ÜNİVERSİTESİ, SAĞLIK BİLİMLERİ FAKÜLTESİ, DİL VE KONUŞMA TERAPİSİ BÖLÜMÜ

Telefon: +908504503439
E-mail: dktaysenurkocak@gmail.com/aysenur.kocak@atlas.edu.tr

Gönderim Tarihi: 08 MARCH 2024
Kabul Tarihi: 03 APRIL 2024

INTRODUCTION

A speech and language pathologist (SLP) is a healthcare professional who works with communication, language, speech, voice, and swallowing (1). SLPs need to support the communication of people who do not have sufficient verbal or nonverbal communication (2, 3). For this reason, AAC has been developed and used as a solution to the insufficiency of verbal communication. When we look at the history of AAC systems, it is thought to date back to the 1960-1970s. In the 1970s, with the systemic developments (laws, technology, printing, etc.), AAC systems underwent change and development (4). SLPs are the primary authorities for preparing and teaching communication with AAC (5).

AACs are divided into three main categories. There are different types of AAC systems. These systems can be high-tech, low-tech, or unassisted (unaided) systems (3, 6). For example, with the programs installed in high-tech devices such as computers, phones, and tablets, individuals can be supported to meet their communication needs and to form words and/or sentences appropriate to their needs through these systems (7, 8). In another example, it is stated that our gestures, mimics, and body movements can be used as an AAC system and are classified as unassisted systems (3, 9-11). SLPs give priority to individual needs after the evaluation session. Then, the SLP finds the appropriate AAC system match, according to the individual's needs (3, 7, 8).

AAC systems can be used for different kinds of disorders (7) such as Cerebral Palsy (12), Dysarthria (13), Alzheimer's (14), Down Syndrome (15), Dementia (16), Delayed Language and Speech (17), Childhood Apraxia of Speech (18), and autism spectrum disorder (19, 20).

AAC can also be used in educational practices (21, 22). In addition, many studies stated that these systems are also used to support literacy skills (23, 24). This study highlights the importance of investigating SLPs' knowledge of AAC systems before teaching them how to use AAC

Marvin et al. (25) stated that most of the SLPs were not satisfied using the AAC. Like this study, Costigan & Light (26) stated, that SLP training with AAC in the bachelor's degree is not sufficient, and also SLPs do not use AAC systems effectively. Similarly, Wormnæs & Abdel Malek (27) investigated the AAC use of the Egyptian SLPs. The participants stated that they do not have enough information about AAC to use in their clinical settings. As we see in the literature, this study aims to find the Turkish SLP's knowledge, thoughts, and usage of AAC in clinical settings. The following research questions were addressed:

Do speech-language pathologists vary in their knowledge about augmentative and alternative communication (AAC) systems based on the length of time they have worked as an SLP?

1. Does their knowledge differ based on how often they use AAC systems in their clinical practice?

2. Do their levels of knowledge change if they have taken a course or attended a lecture on AAC?

3. Are SLPs comfortable using AAC systems in their therapies?

4. What are the opinions of Turkish SLPs regarding the use of AAC in clinical settings?

METHODS

Procedures

Research Design

In this study, both qualitative and quantitative data were used. Quantitative data reviewed with a descriptive analysis. For open-ended questions, thematic analysis was used. These analyses were converted to frequency tables. The research was carried out after the ethical permissions.

Data Collection

Participants were reached through social platforms and the survey link was sent to those who accepted voluntary participation. Participants were informed about the research before the presentation of the questionnaire. Afterwards, the questionnaire was presented to the participants via Google forms.

Participants

Inclusionary criteria were (a) currently working as an SLP, (b) currently living in Turkey, and (c) currently performing therapies in Turkish. In this context, 33.3% of the participants have been working as SLPs for 2-3 years, and 55.6% of them working in rehabilitation

centers. 45 SLPs participated in the survey. See Table 1, for the participant's information.

Table 1. Sociodemographic Information

		n	%
Length of service as an SLP	0-1 year	11	24.4
	1-2 year	5	11.1
	2-3 year	15	33.3
	3-4 year	4	8.9
	4-5 year	8	17.8
	More than 5	2	4.4
Workplace	Rehabilitation center	25	55.6
	Private hospital	3	6.7
	Public hospital	6	13.3
	Speech and language clinic	13	28.9
	Psychological counseling center	10	22.2
	University	9	20.0
	Disability free-living center	1	2.2

MATERIALS

Researchers developed "The Alternative and Augmentative Communication Knowledge Questionnaire" (AACQ) to investigate the Turkish SLPs knowledge about the AAC. This questionnaire items were prepared by the authors with support from the literature (25- 30).

AACQ consists of three parts; a) collecting the demographic information of the SLPs (their graduation year, the university they graduated from, how many years they have been working as an SLP, whether they had taken courses about AAC, etc.), b) 17 items to determine SLPs knowledge level about the AAC (true / false / I don't know) & c) also contains two open-ended questions to understand the thoughts of the Turkish SLPs about AAC. The 17 items were created to assess knowledge and thoughts with open-ended questions.

Data Analysis

The data were analyzed by SPSS-22. Also, frequency tables were formed for the sociodemographic questions. To see the differences in the group means of the variables according to the AACQ Score, a non-parametric Kruskal Wallis-H analysis was applied for the variables with three or more groups, and the non-parametric Mann Whitney-U analysis was applied for the variables with two groups. Analyzes were applied at the level of $\alpha = 0.05$. In Table 2, the questionnaire's normality analysis and reliability analysis are pointed out. Kurtosis outs and skewness values were -2; since it exceeded the +2 limit, non-parametric tests would be used in the analysis (31). For the qualitative data, the responses for the open-ended questions are analyzed by organizing the answers of the participants. These responses and category titles were detailed and shown in the results.

RESULTS

The number of correct answers given by the participants to the questions and their rates are given in Table 3. The percentages of correct answers to the questionnaire are shown in bold.

AACQ scores differ statistically and significantly according to the group that uses AAC in clinical settings ($p = .003$). AACQ scores ($15.57 \pm .97$) of the SLPs who use the AAC in clinical settings are significantly different and higher than the SLPs who do not use AAC in clinical settings (12.81 ± 3.12). AACQ scores of the SLPs did not differ statistically and significantly, according to taking a lecture about the AAC component ($p = .821 > .05$). AACQ scores of the SLPs did not differ statistically and significantly according to the taken AAC courses component ($p = .058 > .05$). AACQ scores did not differ statistically and significantly according to length of service as an SLP component ($p = .664 > .05$) (Table 4).

Table 2. Normality Analysis

Variable	n	Mean	Success Percentage	SD	Kolmogorov Smirnov (p)	Distortion	Kurtosis
AACQ	45	13.25	77.94	3.06	.001	-2.197	7.105

*$p < .05$

Table 3. Frequency Distribution of AACQ Responses

	Yes		No		I don't know	
	n	%	n	%	n	%
1. Individuals of all ages can use AAC	**42**	**93.3**	2	4.4	1	2.2
2. AAC has a negative effect on the verbal production of speech	2	4.4	**41**	**91.1**	2	4.4
3. There is no difference between "alternative" and "augmentative" terms	1	2.2	**42**	**93.3**	2	4.4
4. Sign language isn't an AAC	15	33.3	**22**	**48.9**	8	17.8
5. AAC has three subtitles high technology, low technology, and unaided	**32**	**71.1**	1	2.2	26.7	12.0
6. SLPs are the professionals who are responsible for teaching the AAC	**37**	**82.2**	4	8.9	4	8.9
7. AAC is used only for acquired speech disorders	0	0	**42**	**93.3**	3	6.7
8. PECS method is not included in AAC	2	4.4	**34**	**75.6**	9	20
9. AAC is used only in individuals with no verbal output	1	2.2	**41**	**91.1**	3	6.7
10. Cultural differences are taken into account when choosing the AAC method	**41**	**91.1**	1	2.2	3	6.7
11. Other professions (psychologists, occupational therapists, etc.) can also apply AAC	**25**	**55.6**	6	13.3	14	31.1
12. AAC can not be used if the individual cannot understand the conversations	7	15.6	**26**	**57.8**	12	26.7
13. AAC is only used if the individual has an impairment in speech production	3	6.7	**37**	**82.2**	5	11.1
14. AAC should be prepared individually	**42**	**93.3**	1	2,2	2	4.4
15. SLPs determine whether AAC is suitable or not for the individual	**39**	**86.7**	3	6,7	3	6.7
16. AAC is only supporting communication in daily life, not in therapies	26	57.8	**15**	**33,3**	4	8.9
17. Game boards prepared in certain themes (fruit, vegetables, etc.) can also be used as AAC	**38**	**84.4**	2	4,4	5	11.1

Table 4. Comparing the AACQ Scores of the Participants According to Sociodemographic Information

AACQ Score According to	Group	n	Mean	SD	z	Df	p
Clinical Usage of the AAC	Yes	7	15.57	.97	-2.915	43	**.003**
	No	38	12.81	3.12			
Taking a Course About AAC	Yes	2	16.00	.00	-1.895	43	.058
	No	43	13.11	3.07			
Taking a Lecture About AAC	Yes	26	13.42	3.16	-.226	43	.821
	No	17	13.23	2.88			
Length of Service as an SLP	0-1 year	11	13.72	1.73	4	2.392	.664
	1-2 year	5	13.80	1.09			
	2-3 year	15	13.46	2.72			
	3-4 year	4	9.00	6.83			
	4 years and more	10	13.80	2.44			
	Total	45	13.24	3.06			

It was observed that 80% of the participants were not comfortable using AAC. When the AAC examples of the same participants were analyzed, 32.94% of them mentioned "Communication Boards" as an example.

Table 6 shows thematic analysis of SLP responses to the "What do you think about AAC usage in clinical settings?" question.

Table 5. Participants' comfort using the AAC and their examples of the AAC

Variables		n	%
Are you comfortable using the AAC in your therapies?	Yes	4	8.9
	No	36	80.0
	I don't know	5	11.1
AAC Examples	Communication Boards	28	32.94
	Technological Aided Devices	22	25.88
	PECS	20	23.52
	No response	6	7.05
	Sign Language	5	5.88
	Gestures and Mimics	4	4.70

Discussion

This study examined Turkish SLPs' knowledge, as well as thoughts and beliefs in AAC. Clinical usage of the AAC impacts SLP AAC knowledge. The majority of the SLPs reported they were more likely to use AAC in the future if they had more knowledge and materials to work with.

This study aimed to explore the opinions of Turkish SLPs on Augmentative and Alternative Communication (AAC). The results showed that 57.8% of the participants had taken a course on AAC during their undergraduate studies. However, only 8.9% of the participants found their undergraduate education about AAC sufficient. This may explain why Turkish SLPs do not feel adequate in using AAC in their clinical settings. These findings are consistent with the research by Costigan and Light (26), who reported that undergraduate SLP training on AAC was inadequate. Marvin et al. (25) also reported that a majority of SLPs were not incorporating AAC in their therapy sessions. Similarly, Costigan and Light (26) found that SLPs were not effectively using AAC in their clinical practice. Also, in Wormnæs & Abdel Malek's (27) study, SLPs do not have enough information about using AAC in clinical settings. Supporting these studies in this study, only 15.6% of the Turkish SLPs were using AAC in their clinical settings. Only 8.9% of the participants were comfortable with including AAC in their therapies. These findings were also similar to the literature.

Table 6. The views of AAC usage in clinical settings

Title	n	%	Examples
It could be suitable for clinical settings, and SLPs should use it more	25	55.5	P2- I think it is very useful and should be frequently used in clinical settings.
			P4- A good tool to support verbal and non-verbal communication in clinical settings.
			P38- We definitely need to use the AAC in sessions.
Applications in the clinical setting are not common due to insufficient material, knowledge, and beliefs of the patient's families.	12	26.6	P3- I find it easier to use an AAC in a clinical setting when the parent is involved, but it could be hard to involve parents because they might not understand an AAC.
			P25- It is important to use it when it comes to non-verbal patients, but we do not have enough knowledge to use it properly.
			P27- Our patient wants us to work on verbal communication, so it is hard to use it.
I don't know	2	4.4	P30- I don't have a thought
			P35- I don't know
I don't use it	6	13.3	P31- I don't use it
			P32- I don't think I will use it.
			P33- I don't use it

P = participant

Most of the participants gave the correct answers to the AACQ questionnaire items. Only two items in the questionnaire have an accuracy rate lower than 50%. When items are analyzed, in more detail: Q4. Sign language is not an AAC and Q16. AAC only supports communication in daily life, not in therapies. Nunes (20) and Hidecker (32) stated that SLPs could use sign language as an AAC method. Clarke et al. (33) state that AACs are not only for supporting daily life communications. Also, SLPs need to involve AACs in their therapies. This result shows that Turkish SLPs need more knowledge about a) the different types of AAC systems, and b) where to use AAC systems.

In this research, the AACQ scores of the Turkish SLPs who used AAC in their therapies were statistically higher than the group who did not use AAC systems in their therapies. This study suggests that SLPs who use AAC systems in their therapies are likely to have more knowledge about AAC.

There are many types of AAC systems. These systems are categorized into three main groups (unaided, low-tech, and high-tech). Within these three groups, there are many different tools. However, it was observed that the participants only gave five examples. The examples mostly included low-tech devices and unaided devices. For example, PECS and communication boards could be examples for the low-tech. Sign language, and gestures could be examples of unaided devices. This result indicated that Turkish SLPs lack information about the types and examples of ACC systems.

Most of the Turkish SLPs assume that AAC systems could be used in therapy sessions. However, some participants are doubtful about using AAC systems in their therapies. This doubt was caused by insufficient sources about AAC, and families' negative attitudes towards AAC systems. Similarly, McCord & Soto's (34) study stated that families may be prejudiced against the use of AAC in therapy. As SLPs, we should inform families about AAC systems. The information may include the evaluation process, intervention process, evidence, effectiveness of AAC systems, daily practice, and clinicians' knowledge about AAC systems (35). In this study, our participant's quotes support the literature about these negative thoughts and how to prevent them. Due to families' negative thoughts and beliefs, SLPs need to give sufficient information about AAC systems. Yaşa & Tokalak (36) stated that Turkish SLPs thought AAC systems have potential value for individuals with communication disorders. Like this study, they did not think they had sufficient self-confidence about their current or developing skills in this area.

Clinical Implications

Turkish SLPs face various obstacles in using AAC systems, such as lack of knowledge about AAC systems, inadequate materials, negative attitudes of families towards AAC, and discomfort in using AAC systems. If these barriers can be addressed, Turkish SLPs' use of AAC in therapies may increase. Enhancing the undergraduate education of SLPs in AAC can help alleviate the challenges that may arise from using AAC, such as the comfort of use and addressing families' concerns. As SLPs gain more experience in using AAC systems, they can create more affordable versions of these AAC products. Additionally, conducting more research and developing therapy programs that incorporate AAC systems can help to improve lectures and provide valuable resources for SLP students and clinicians to improve their knowledge of AAC's future directions. Overall, this study highlights the need for Turkish SLPs to learn more about AAC and how to use it effectively in their therapies. Their knowledge can significantly impact the comfort of using AAC in the clinic. Which in turn affects how they communicate the benefits of AAC to their clients' families. Further studies are necessary to explore AAC usage in Turkey.

Limitations and Future Directions

This investigation did not directly assess or observe the practices of the SLPs. In addition, Turkish literature has limited research on AAC systems. The field of Augmentative and Alternative Communication (AAC) is significantly underdeveloped in Turkey. Our participants have confirmed that most of the undergraduate programs do not provide any lectures about AAC. It is believed that conducting studies on adapting these ACC systems to educational processes would be beneficial.

Conclusion

As a result, SLPs' knowledge of the AAC systems could be improved by implementing the AAC into their therapies. According to that information, SLPs do not implement AAC models in their therapies, because lack of knowledge may affect their clinical comfort. The majority of the participants in the study suggested that AAC models can be used in therapies. However, they also

pointed out some issues that need to be addressed, such as the lack of knowledge among SLPs about AAC, families' opinions, and insufficient AAC materials. To overcome these challenges, it is essential to develop materials that are compatible with Turkish culture and language. It is essential to investigate the thoughts and beliefs of SLPs to develop an AAC compatible with the Turkish language. In addition, there is a need to improve undergraduate education for SLPs to become more competent in AAC (29, 30). With this development, it is thought that samples and AAC varieties can be kept up to date in Turkey.

Financial Support
No financial support was received within the scope of the study.

Conflict of Interest
There is no conflict of interest between any institution, organization or researchers within the scope of the study

Ethics Committee Approval
The ethics committee of this research was approved by İstinye University Human Research Ethics Committee on 10.03.2022 with protocol number 22-42. At the same time, all participants were informed about the research, and voluntary consent was read before data collection.

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