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Determining the Awareness and Attitudes of Professionals Working with Individuals with Special Needs Towards Alternative and Augmentative Communicatıon Systems

Özel Gereksinimli Bireyler ile Çalışan Profesyonellerin Alternatif ve Destekleyici İletişim Sistemlerine Karşı Farkındalık ve Tutumlarının Belirlenmesi

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ABSTRACT

Aim: *The study aimed to determine the awareness levels and attitudes of professionals working with individuals with special needs towards Alternative and Augmentative Communication Systems.*

Material and Method: *The study included 194 professionals aged between 21 and 67, working at special education and rehabilitation centers in Ankara. Participants were administered a sociodemographic information form and the Attitude Scale for Alternative and Augmentative Communication Systems. The data were analyzed using the SPSS Statistics IBM Version 26.0 software.*

Results: *In our study, it was found that professionals aged 35-40, women, those with a doctoral level of education, and professionals with more than 10 years of experience working with individuals with special needs had higher scores on the Attitude Scale for Augmentative and Alternative Communication Systems. On the other hand, no statistically significant difference was found in attitude scale scores in terms of variables such as professional groups, attending courses related to augmentative communication systems, participation in special augmentative communication system courses, and the implementation of augmentative communication systems.*

Conclusion: *Training programs designed for professionals from various disciplines working with individuals with special needs may benefit from including more comprehensive information and practical opportunities related to augmentative and alternative communication systems. This could enable professionals to establish more effective and meaningful interactions with these individuals.*

Keywords*: Individuals with special needs, Communication, Alternative communication*

ÖZET

Amaç: *Özel gereksinimli bireyler ile çalışan profesyonellerin Alternatif ve Destekleyici İletişim Sistemlerine yönelik farkındalık düzeylerinin ve tutumlarının belirlenmesi amaçlandı.*

Gereç ve Yöntem*: Çalışmaya, Ankara şehrindeki özel eğitim ve rehabilitasyon merkezlerinde çalışan, 21-67 yaş aralığında 194 meslek profesyoneli katıldı. Bireylere sosyodemografik bilgi formu ile Alternatif ve Destekleyici İletişim Sistemleri Tutum Ölçeği uygulandı. Veriler SPSS Statistics IBM Version 26.0 programı ile analiz edildi.*

Bulgular: *Çalışmamızda, 35-40 yaş aralığında olanların, kadınların, doktora seviyesinde eğitim almış profesyonellerin ve özel gereksinimli bireylerle 10 yıldan fazla deneyime sahip olan profesyonellerin Destekleyici İletişim Sistemleri Tutum Ölçeği puanlarının daha yüksek olduğu bulundu. Diğer taraftan, meslek grupları, alternatif iletişim sistemleriyle ilgili kurslar alma, özel alternatif iletişim sistemleri kurslarına katılım ve alternatif iletişim sistemlerinin uygulanması gibi değişkenler açısından tutum ölçeği puanlarında istatistiksel olarak anlamlı bir fark tespit edilmedi.*

Sonuç: *Özel gereksinimli bireylerle çalışan farklı disiplinlerdeki profesyonellere yönelik hazırlanacak eğitim programlarının, alternatif ve destekleyici iletişim sistemlerine ilişkin daha kapsamlı bilgi ve uygulama olanağı içermesi profesyonellerin bu bireylerle daha etkili ve anlamlı etkileşimler kurabilmesine faydalı olabilir.*

Anahtar kelimeler: *Özel gereksinimli bireyler, İletişim, Alternatif iletişim*

INTRODUCTION

Although communication limitations vary depending on the type of disability, they are prevalent among many individuals with disabilities. Those with severe and multiple disabilities often face even greater challenges in communication. This situation can negatively impact their quality of daily life and overall developmental domains. To mitigate these adverse effects, enhance quality of life, and ensure that individuals receive the necessary education, a specialized communication system must be developed. Alternative and Augmentative Communication (AAC) systems are easy to use and adaptable for individuals affected by various disabilities and communication limitations (Light & McNaughton, 2014).

AAC systems encompass a range of approaches designed to meet, support, or replace the communication needs of children and adults with disabilities while also enhancing speech and language learning processes for some children. Various medical conditions may necessitate AAC system interventions, either temporarily or permanently (Beukelman & Mirenda, 2013). AAC systems can be classified as aided or unaided, depending on whether they require any equipment (Light & McNaughton, 2014). These systems range from technology-free methods to advanced computer-based devices with synthesized speech output (Radici et al., 2019). Techniques within AAC can be tailored to the individual's unique needs, reducing communication limitations and improving quality of life (Dietz, Wallace, & Weissling, 2020). Effective implementation of these techniques requires collaboration between professionals, families, and educators (Schlosser & Wendt, 2008). The management of individuals requiring AAC systems should involve active participation from the individual and cooperation from a multidisciplinary team, including parents and healthcare and educational professionals, to create a supportive and adaptable framework that enables individuals to communicate effectively and participate fully in various aspects of life (Langarika-Rocafort, Mondragon, & Etxebarrieta, 2021).

In a study conducted by Langarika-Rocafort, Mondragon & Etxebarrieta (2021), it was aimed to determine the effects of AAC systems based interventions on communication skills in children between the ages of 6 and 10 who have multiple diagnoses and therefore require the intervention of more than one professional. The study showed that the use of AAC systems in children with additional diagnoses supports children in many areas, including the development of both receptive communication skills (e.g., understanding vocabulary and following instructions) and expressive communication skills (e.g., using vocabulary, making requests, and storytelling. In another study, it was emphasized that AAC systems are effective in facilitating and improving the communication skills of children diagnosed with autism spectrum disorder, which is highly prevalent in society and requires the intervention of both speech and language therapists and other field experts such as special education teachers in their education (Syriopoulou-Delli & Eleni, 2022).

The role of AAC systems in post-stroke aphasia rehabilitation, in which professionals such as speech and language therapists, physiotherapists, and occupational therapists are involved in the intervention, has been investigated in a study. The versatility of AAC strategies is reviewed and emphasized how AAC systems can be used to include individuals with aphasia with full participation and independence in life. Moreover, it is argued that AAC systems can be seen as a tool that, while providing a communication alternative, can also lead to the improvement of language performance and perhaps partial restoration of language function (Dietz, Wallace, & Weissling, 2020).

The benefits of AAC systems use can be discussed in several different areas, and research has shown that its use positively contributes to a person's speech, language development and literacy, business life, and quality of life. The use of AAC systems increases a person's independence and quality of life (Odluyurt, Tutuk, & Çavuşoğlu, 2018). In literature, it is stated that professionals and parents believe that the use of AAC systems has a negative impact on individuals' language and communication skills (Beukelman, 1987; Dowden and Marriner, 1995). Contrary to fear, the use of AAC systems does not have a negative effect on language development and speech. As a result of studies conducted with students with autism and developmental delays regarding the use of AAC system, it has been seen that it has positive effects on language development and speech (Schlosser & Wendt 2008; Millar, Light, & Schlosser, 2006).

The success of the evaluation, diagnosis, training, and intervention of individuals with additional disabilities according to their disability areas is directly proportional to the versatility of the service providers, their professional equipment and their awareness of the individual's disability areas. The use of AAC systems especially in individuals with additional disabilities, require the correct intervention of many disciplines simultaneously. For this reason, it is important that professionals representing all disciplines who will intervene regarding AAC systems have the necessary awareness and knowledge level to support communication skills. Professionals' awareness, their level of knowledge, years of experience in the profession, the courses and training they have received for AAC systems, and their experiences with students using these systems may affect the use of AAC systems (Aldabas, 2021).

In the literature, there are many studies examining the awareness of special education teachers working with individuals with additional disabilities regarding AAC systems (Ege, 2006; Tuna, 2022; Mehmet, Kılıç, & Şafak, 2023). However, there are a limited number of studies showing the awareness of speech-language pathologists, audiologists, special education, preschool and classroom teachers, and psychology graduates who will intervene in individuals with disabilities in more than one area (mental, physical, and speech). However, the importance of a multidisciplinary approach to meet the needs of individuals with disabilities in multiple areas is emphasized. The purpose of this study is to determine the awareness levels and attitudes of professionals working with individuals with special needs towards alternative and augmentative communication systems.

MATERIALS AND METHODS

Research Type

The type of this study was cross-sectional and descriptive.

Study Population and Sample

The data collection part of the research took place in Special Education and Rehabilitation Centers in Ankara between March 2023 and December 2023. Professionals aged 21-67, including speech-language pathologists, audiologists, special education teachers, pre-school teachers, classroom teachers, child development specialists, and psychologists who work with individuals with special needs in the particular education center, participated in the study. Participants' neurological and psychiatric health problems were considered as exclusion criteria and were determined using the Sociodemographic Information Form, which collected detailed information on their health status. G power 3.1 program was used to determine the sample size. It was calculated with A priori type power analysis by selecting the ANOVA fixed effect, omnibus, one-way test parameter from the F test family in the program. According to the Attitudes Towards AAC Systems Scale, the minimum number required for the total sample size with a medium effect size, 95% confidence interval, and 80% power was determined as 180. The study was completed with 194 individuals since 3 participants wanted to leave the study.

Procedure

The Attitude Scale towards Alternative and Augmentative Communication was administered to the professionals who participated in the study, and the scale scores were compared according to various sociodemographic variables. The variables included profession (speech-language pathologist, audiologist, special education teacher, preschool teacher, child development specialist, classroom teacher, psychologist), education level (bachelor's degree, master's degree, doctorate), participation in AAC courses during education (those who took courses vs. those who did not), attendance in private AAC courses (those who attended vs. those who did not), professional application of AAC systems (applying professionals vs. non-applying professionals), and experience working with individuals with special needs (less than 1.99 years, 2-4.99 years, 5-10 years, more than 10 years). The scale results were analyzed to identify significant differences based on these variables and explore the relationship between sociodemographic data and the Attitude Scale scores towards AAC systems.

Data Collecting Tools

The researchers developed survey questions to collect sociodemographic information from the participants. The "Attitude Scale Towards Alternative and Augmentative Communication Systems" was implemented to assess participants' views, beliefs, and attitudes toward alternative and augmentative communication systems.

Sociodemographic Information Form: The information form collects data on variables such as age, gender, profession, education level, years of experience working with individuals with special needs, whether they have taken courses related to AAC systems during their education, whether they have attended any private courses, and whether they have professionally implemented these systems. The form is designed as a structured questionnaire with multiple-choice options for each item, rather than open-ended questions, to ensure systematic data collection. The researchers specifically developed this form to identify demographic variables within the scope of the study.

The Attitude Scale towards Alternative and Augmentative Communication Systems: The Attitude Scale Towards AAC systems was developed by Soto (1995). The original version of the scale consisted of 30 items in total (Soto, 1997) and was found to have a five-factor structure that explained 42% of the total variance. The internal consistency coefficients (Cronbach's Alpha) for each factor ranged between 0.82 and 0.69. The Turkish adaptation, reliability, and validity study of the scale was conducted by Servi & Bastuğ (2021 After the analyses were completed, 10 items were removed from the measurement tool. The revised Turkish version, consisting of 20 items, was grouped under 5 factors. The Cronbach's alpha value of the Turkish form was calculated to be 0.72. The scale utilizes a 5-point Likert format, where 1 indicates "Strongly Disagree" and 5 indicates "Strongly Agree." The lowest score possible on the scale is 20, while the highest score is 100. A higher score indicates a more positive attitude towards AAC systems (Servi & Bastuğ, 2021).

Ethical Considerations

The study was approved by the Scientific Research Ethics Committee. (Registration Number: 2023/19: Approval Date: 01.02.2023 and was implemented within the framework of ethical rules established according to the Declaration of Helsinki.

Data Analysis

SPSS Statistics IBM Version 26.0 program was used for statistical data analysis. Frequencies (n), percentages (%), and arithmetic Mean ± Standard Deviation (SD) were calculated for descriptive statistics. The data distribution was evaluated by Skewness, Kurtosis and Histogram Analysis, Kolmogorov-Smirnov test, and coefficient of variation ratio. The data showed a normal distribution for all variables except occupation. For normally distributed data, comparisons between two groups (for gender, AAC systems course during education, private course for AAC systems and professionally applying AAC systems) were analyzed with Independent-Samples t-test, and more than two-group comparisons (for age, education level, experience with special needs) were analyzed with One-Way ANOVA test. Professional groups were compared with the Kruskal-Wallis test since there was no normal distribution. Post-hoc analysis with Bonferroni correction was performed for pairwise comparisons of multiple groups. The relationship between the Attitude Towards AAC Scale and the years of working with people with special needs and the age of the participants was examined using the Pearson correlation test. The correlation coefficient (r) between 0.00- 0.19 was considered no or negligibly low relationship, values between 0.20-0.39, 0.40-0.69, 0.70-0.89, and 0.90-1.0 were considered weak (low), moderate, strong (high), and very strong relationship respectively (Alpar, 2017). The statistical significance value was accepted as $p< 0.05$.

RESULTS

A total of 194 (162 female, 32 male) professionals working in the field of special education, ages between 21-67 years (Mean= 31.25±8.71), participated in the study (Table 1).

The mean total scores of the Attitude Scale Towards AAC systems according to sociodemographic and descriptive groups are given in Table 1. A statistically significant difference was found in the total score of the attitude scale towards AAC systems according to age categories. It was determined that this difference in age category was caused by the under 25 and 36-40 age groups (p=0.003). The total score of the attitude scale towards AAC systems was observed to be the lowest in individuals under 25 years of age, while the highest in individuals between the ages of 36-40. It was also found that women had a higher total score of the attitude scale towards AAC systems than men. A statistically significant difference in the total score of the attitude scale towards AAC systems according to the level of education was due to the difference between undergraduate and doctoral education (p=0.026). It was determined that the total score of the attitude scale towards AAC

systems at the doctoral level was the highest and the lowest at the undergraduate level. The statistically significant difference in the total score of the attitude scale towards AAC systems, based on the years of experience working with individuals with special needs is due to the groups with <2 years and less than 5-10 years (p=0.013) and <2 and >10 years (p=0.002) of experience. It was found that professionals with more than 10 years of experience had the highest total score on the attitude scale towards AAC systems, while professionals with less than 2 years of experience had the lowest. No statistically significant difference was found in the total score of the attitude scale towards AAC systems according to the variables of profession, taking AAC systems course during education, taking private lessons on AAC systems and implementing AAC systems.

Table 1. Distribution of Mean Total Scores of Attitude Scale Towards AAC Systems According to Sociodemographic Categorical Groups

			Attitude Scale AAC-s			
Descriptive Features	**n**	**%**	**Mean ± SD (points)**			
Age				**p**	**F**	**df**
Below 25 age	65	33.5	67.40 ± 4.18			
25-30 age	40	20.6	69.32 ± 5.98			
31-35 age	44	22.7	69.50 ± 4.46			
36-40 age	18	9.3	72.22 ± 4.54			
Above 40 age	27	13.9	69.96 ± 5.52	[a]0.003	4.102	4
Gender				**p**	**t**	**df**
Female	162	83.5	69.40 ± 5.01			
Male	32	16.5	67.43 ± 4.92	[b]0.044	2.028	192
Profession				**p**	**F**	**df**
Speech Language Pathologist	52	26.8	70.07 ± 4.86			
Audiologist	41	21.1	67.87 ± 5.68			
Special education teacher	40	20.6	68.35 ± 4.74			
Preschool teacher	26	13.4	68.92 ± 5.65			
Child development specialist	22	11.3	70.09 ± 4.38			
Classroom teacher	7	3.6	70.85 ± 2.85			
Psychologist	6	3.1	68.33 ± 4.50	[c]0.184	1.191	6
Education Level				**p**	**F**	**df**
Bachelor's degree	138	71.1	68.37 ± 4.68			
Master's degree	26	13.4	68.84 ± 5.40			
Doctorate	30	15.4	71.30 ± 5.86	[b]0.030	3.555	2
AAC systems course during education				**p**	**t**	**df**
Professionals who took	119	61.3	69.69 ± 4.94			
Professionals who didn't take	75	38.7	69.68 ± 5.17	[b]0.187	-1.324	192
Private course for AAC systems				**p**	**t**	**df**
Professionals who attended	79	40.7	69.27 ± 5.27			
Professionals who didn't attend	115	59.3	68.93 ± 4.91	[b]0.646	0.459	192
Professionally applying AAC systems					**t**	**df**
Applying professionals	104	53.6	69.51 ± 5.00			
Not applying professionals	90	46.4	68.56 ± 5.67	[b]0.190	1.314	192
Experience with special needs (year)				**p**	**F**	**df**
< 1.99	56	28.9	67.10 ± 4.50			
2- 4.99	45	23.2	68.84 ± 5.09			
5-10	47	24.2	70.10 ± 5.44			
> 10	46	23.7	70.65 ± 5.48	[a]0.001	5.366	3

AAC systems: Alternative and Augmentative Communication systems, n: Number of Participants, %: Percentage SD: Standard Deviation, a: One-Way ANOVA Test, b: Independent-Samples t-Test, c: Kruskal Wallis Test.

Table 2 gives the mean total scores of the Attitude Scale Towards AAC systems and its sub-dimensions for all the participants (n=194).

A statistically negligibly low significant relationship (p=0.035; r=0.151) was found between the Attitude score towards AAC-s Scale score and the age of professionals. It was concluded that there was a

statistically weak significant ($p<0.001$; $r=0.273$) relationship between the Attitude Towards AAC Sytems Scale score and the years (experience) of working with individuals with special needs. It was concluded that as the age of the participants and the years of working with individuals with special needs increased, the attitude towards AAC improved.

Table 2. The Attitude Scale Towards AAC Systems Total and Sub-dimension Scores of All Participants

Attitude Scale AAC systems and its sub-dimensions	Mean ± SD
Total Attitude AAC systems	69.07 ± 5.04
Perceptions of students' abilities	12.79 ± 2.28
Perception of own skills and responsibilities	11.55 ± 1.50
Perception of SLP's responsibilities	17.60 ± 2.21
Attitude toward communication training	11.19 ± 2.32
Intention to use AAC in the classroom	15.92 ± 3.13

AAC systems: Alternative and Augmentative Communication systems, SD: Standard Deviation

DISCUSSION

The results of this study provide important insights into the factors influencing professionals' attitudes toward AAC systems. Specifically, significant relationships were found between attitudes toward AAC systems and variables such as age, years of experience working with individuals with special needs, and gender. These findings offer valuable clues for improving the implementation and understanding of AAC systems. In particular, the study found a significant relationship between attitudes toward AAC systems and age. This finding indicates that age is an essential factor influencing professionals' attitudes toward AAC systems. Schlosser and Raghavendra (2004) suggested that age could enhance professionals' positive attitudes toward AAC systems. They noted that the increased experience and knowledge gained with age help professionals better understand the effectiveness and applicability of AAC systems (Schlosser & Raghavendra, 2004). Similarly, Light and McNaughton (2014) found that age contributed to developing more positive attitudes toward AAC systems and that professionals' observations of various situations over time helped foster these positive attitudes (Light & McNaughton, 2014). One of the other findings in our study is that attitudes toward AAC systems become more positive as the years of experience working with individuals with special needs increase. This finding is consistent with similar studies in the literature. For example, Schlosser and Raghavendra (2004) and Light and McNaughton (2014) reported that experience positively influences professionals' attitudes toward AAC systems (Schlosser & Raghavendra, 2004; Light & McNaughton, 2014). These results suggest that experience contributes to a deeper understanding of the effectiveness and importance of AAC systems, leading to the development of more positive attitudes. Experienced professionals can better grasp the benefits of AAC systems and are, therefore, more likely to use these systems effectively (Schlosser & Raghavendra, 2004; Light & McNaughton, 2014).

Our study has revealed that gender significantly affects attitudes toward AAC systems. This finding is consistent with some studies in the literature. For example, Schlosser and Raghavendra (2004) noted that gender influenced attitudes toward AAC systems. They suggested that women tend to have more positive attitudes towards these systems than men (Schlosser & Raghavendra, 2004). Similarly, Binger and Light (2006) indicated that gender differences might interact with factors such as AAC training and courses, with female professionals generally having higher attitude scores (Binger & Light, 2006). However, studies by Servi and Baştuğ (2021) found no significant effect of gender on attitudes toward AAC systems (Servi & Baştuğ, 2021). These studies suggested that professionals' attitudes are shaped more by their professional experience and knowledge than their gender. Therefore, findings that show gender's effect on attitudes toward AAC-s is influenced by context and other factors indicate that women's empathetic and supportive approaches may positively affect attitudes, suggesting that gender could play a determining role in these attitudes. This result is related to some existing contradictions in the literature regarding the effect of gender on attitudes. Specifically, McGarthy and Light (2009) found that women exhibited more positive attitudes towards individuals using AAC systems compared to men, while other studies suggest that the effect of gender is limited.

In our study, no significant effect was found of variables such as education level, courses related to AAC systems, attendance at AAC courses, and the application of AAC systems on professionals' attitudes toward AAC systems. Similarly, Radici et al. (2019) indicated that graduation status did

not make a difference in attitudes toward AAC, noting that the most significant differences arose from training in the use of the AAC system and practical experiences gained from working with students using AAC (Radici et al., 2019). This finding suggests that while the impact of education level and courses may be limited, practical experiences might have a more decisive effect on attitudes. On the other hand, Servi and Baştuğ (2021) reported high attitudes among professionals who had received training in AAC (Servi & Baştuğ, 2021). Similarly, Binger and Light (2006) proposed that courses related to AAC training significantly improved professionals' attitudes (Binger & Light, 2006). They emphasized that training helped professionals better understand the effective use of AAC systems and positively changed their attitudes toward these systems (Binger & Light, 2006). These findings support the positive impact of training on attitudes toward AAC, aligning with the results of Servi and Baştuğ (2021). Consequently, while the effect of educational programs and courses on professionals' attitudes towards AAC systems can be significant, these effects should be evaluated in conjunction with the training content, implementation quality, and professional experiences. There is a need for more comprehensive and practical training strategies to enhance the effectiveness of training and improve professionals' attitudes toward AAC systems (Binger & Light, 2006; Radici et al., 2019).

On the other hand, the adequacy of both aided and unaided AAC systems available in our country is an issue that needs to be discussed. It is known that numerous studies have been conducted worldwide on the development of AAC systems adapted to different cultural contexts beyond the English language (https://pubs.asha.org/doi/pdf/10.1044/2022_AJSLP-21-003969). The topic of AAC systems has recently begun to attract attention and become a research focus in our country. Studies should consider obtaining insights from professionals working with individuals with special needs and from families to determine communication needs. For our country, it is believed that there is a need to increase the number of communication models/systems compatible with the Turkish language and culture.

In our study, the low attitudes observed among professionals who received AAC training may be due to the limited number and effectiveness of supportive systems or the restricted access to existing systems. The fact that this study did not investigate the factors influencing attitudes can be considered a limitation. Future research should focus on identifying these factors to raise sufficient awareness of AAC systems, develop effective AAC systems compatible with the language and culture, and foster positive attitudes towards these systems.

CONCLUSIONS

The findings of this study provide significant insights into the factors influencing professionals' attitudes towards AAC systems. The results reveal that variables such as gender, age, and the duration of experience working with individuals with special needs have a notable impact on attitudes towards AAC systems. These findings are crucial for understanding the factors that play a role in enhancing the effectiveness of AAC systems and improving their implementation. Specifically, it was observed that age and years of experience positively influenced professionals' attitudes towards AAC systems, aligning with findings from similar studies in the literature. However, the need for a significant effect of education level and training courses on attitudes suggests that a more in-depth examination of how educational programs and courses impact attitudes is needed. In this context, understanding how various educational strategies and implementation methods shape attitudes emerges as an essential research area for future studies.

Ethics Committe Approval

Ethics committee approval was received for this study from the Lokman Hekim University Scientific Research Ethics Committee (Date: 29.05.2024, and Approval Number: 2024/155).

Author Contributions

Idea/Concept: A.İ.M, E.S.K. Design: A.İ.M, E.S.K. Supervision/Consulting: M.C.; Analysis and/or Interpretation: M.C.; Literature Search: A.İ.M.; Writing the Article: A.İ.M., E.S.K., M.C; Critical Review: A.İ.M., E.S.K., M.C.

Peer-review

Externally peer-reviewed.

Conflict of Interest

The authors have no conflict of interest to declare.

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