Research Paper: Iranian Speech-language Pathologists' Awareness of Alternative and Augmentative Communication Methods

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ABSTRACT

Objectives: Alternative and Augmentative Communication (AAC) provides a means of effective communication to individuals with severe impairments in speech comprehension and production. The present study aimed to examine the awareness of Iranian Speech-Language Pathologists (SLPs) of AAC services.

Methods: In total, 111 SLPs who were selected by convenience sampling method participated in this cross-sectional study. Using a researcher-made questionnaire, information on SLPs' familiarity with the term AAC and its methods; patients who can benefit from AAC methods; the kind of AAC method that could be used per patient, and the effectiveness of each method were obtained. This research was conducted at rehabilitation clinics in Tehran City, Iran.

Results: The obtained results revealed that only 8.1% of the respondents were familiar with the concept of AAC; however, 92.8% of SLPs had contact with Patients With Communication Problems (PWCP). Only 0.9% of SLPs were familiar with high-tech devices. Additionally, 88.3% of the respondents were willing to further educational opportunities concerning AAC.

Discussion: Iranian SLPs had little familiarity with AAC and the target population of these services. Overall, there appeared to be a lack of AAC expertise within the profession in Iran. Therefore, training these professionals, both theoretically and clinically, is essential.

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Highlights

● A small frequency (8.1%) of Iranian SLPs were familiar with AAC services; among them, most were familiar with low-tech devices with limited services.

● The majority (92.8%) of Iranian SLPs had clients with communication problems; thus, they needed AAC services.

● Participation in educational workshops and congresses as well as reading texts insignificantly increased the awareness of SLPs about AAC services.

Plain Language Summary

Numerous adults with nervous system diseases, such as Multiple Sclerosis (MS), Amyotrophic Lateral Sclerosis (ALS), stroke, or Parkinson's disease, as well as children with developmental disorders, encounter inability to communicate with others within the family or community. Therefore, they cannot express their needs and demands. Augmentative and Alternative Communication (AAC) techniques are used as an effective treatment to help those who cannot use language and speech to communicate. Speech therapists, as members of the AAC service team, should be familiar with AAC devices and techniques as well as the needs of patients receiving these services. The present study examined the familiarity of Iranian speech therapists with AAC services and patients who were candidates for these services. In this study, we surveyed 111 Speech-Language Pathologists (SLPs) using a researcher-made questionnaire. Our results indicated that most speech therapists had clients with communication needs and problems; however, their awareness of AAC methods was insufficient. Most of the SLPs were willing to learn more about AAC, especially high-tech devices. The majority of SLPs participating in this study stated that attending workshops and congresses, and reading texts increased their awareness about AAC services.

1. Introduction

The ability to communicate through speech is among the unique capabilities of mankind; it could be lost, either permanently or temporarily, due to different developmental and acquired reasons. Individuals unable to speak have described this loss as one of the most difficult and overwhelming experiences of their lives [1].

Numerous individuals with progressive neural system diseases, such as Multiple Sclerosis (MS), Huntington disease, Amyotrophic Lateral Sclerosis (ALS), and Parkinson's disease; those developmental disorders, such as autism, Intellectual Disability (ID)-induced speech and language disorders, and Cerebral Palsy (CP); and individuals with acquired conditions, including Guillain-Barre syndrome, head and neck cancers, problems due to spinal cord injury, and traumatic brain injury may encounter difficulty in even expressing their most essential needs and requests. Thus, they are unable to communicate with their peers, like family members and other individuals in the society, either permanently or temporarily [2]. Alternative and Augmentative Communication (AAC) methods are among the most available solutions

that can help in solving their communication problems. AAC includes the use of strategies, techniques, and symbols. Besides, it aids to supplement verbal speech or replacing nonfunctional speech [3]. Moreover, AAC attempts to study and compensate the activity limitations, impairments, and participation restrictions of individuals with severe speech-language or comprehension disorders, temporarily or permanently [4]. The term augmentative applies to applying any methods and assistive tools that can support, increase, or complement speech and oral communication skills. These methods can be divided into two groups of dedicated and non-dedicated approaches with low- or high-tech capabilities [2].

According to the American Speech Hearing Association (ASHA), there exist more than two million individuals in the US who are unable to use oral and written language as an efficient and effective tool for communication [5]. Generally, 1%-3% of this population are children and youth who may attend school [1]. The frequency of individuals with significant communication difficulties who require AAC is increasing [6]. Beukelman mentioned some factors that have contributed to the increase in the number of individuals, requiring AAC services [7]. For instance, the incidence of Autism Spectrum Disorders (ASDs) has been significantly increasing in recent years.

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In the US, in 2014, the overall prevalence of ASD across the 11 sites of the Autism and Developmental Disabilities Monitoring (ADDM) network was 16.8 per 1000 (1 in 59) in 8-year-olds [8]. ADDM network is an active surveillance system that prepares the estimates of ASD prevalence. In Iran, Samadi et al. reported a prevalence of 6.26 per 10000 subjects for ASD in 5-year-olds [9]. Approximately, 30%-50% of children with ASDs present no functional speech and require AAC services [10]. Additionally, due to progress in medical interventions, the survival rate of children with developmental and acquired inabilities has increased; however, they may experience communication issues throughout their lives. For example, 95% of children with CP encounter communication disorders and will benefit from AAC intervention [11]. A study in Iran suggested that the number of subjects aged >65 years will be >4 million (10%) by 2035, and >19 million by 2050 [12]. As individuals age, they may experience concomitant impairments, such as sensory-perceptual, cognitive, motor, or language disorders; eventually, they may require AAC services to support communication [13].

Over the last 30 years, fundamental changes have occurred in the awareness and reception of professionals and society regarding AAC. In the past, AAC was considered the last approach when other interventions failed [14]. However, today, evidence highlights the positive outcomes of AAC intervention [15-21]. accordingly, such measures have resulted in the increased awareness of professionals and society about AAC intervention. These changes in the awareness, acceptance and use of AAC methods have been long employed in individuals with severe intellectual disabilities; subsequently, they have been extended to adults with acquired disabilities [6].

Marvin et al. requested 71 SLPs to complete a questionnaire concerning their level of experience and education about using communication aids [22]. Based on their results, >80% of the explored subjects mentioned receiving inadequate education on AAC methods. Moreover, 63% of those using AAC felt uncomfortable using these methods. Besides, 72% of the respondents believed that they were not ready to use such services. However, >50% of SLPs cases declared that they had recommended these methods to their clients. This research indicated that rehabilitation clinicians should provide further training in this respect [22].

Wormnaes and Abdel Malek investigated the experience and knowledge of 30 Egyptian SLPs regarding AAC [23]. The relevant results revealed that 44% of the respondents believed that they were sufficiently competent in the AAC field; 74% believed that it is essential for speech therapists to learn more about AAC [23]. Sutherland et al. investigated the level and type of AAC services for individuals with complex communication needs by surveying speech-language therapists [24]. Their results revealed that 86% of SLPs were willing to obtain more information about AAC services and to receive training. Moreover, SLPs used low-tech systems and body language to communicate with their patients [24].

Ratcliff et al. investigated the knowledge of SLPs respecting AAC services and analyzed the influence of previously performed programs [25]. Accordingly, they found that 73% of the respondents (n=168) participated in AAC educational workshops. They also concluded that generally, university courses about AAC have increased in the last decade; however, there is a growing need in this field, educationally and clinically [25].

Iacono et al. explored the perceptions and awareness of 40 Australian SLPs about AAC that worked within the Australian early childhood settings by performing individual or group interviews [26]. The thematic analysis of their transcripts indicated that SLPs had a broad view concerning AAC services and their advantages. Additionally, the authors introduced time limitation as a major barrier to performing AAC methods and best practices by the clinicians. Although the respondents informed the families of their children's intervention, there was evidence related to struggling with the negative attitudes of families toward using AAC [26].

Tegler et al. studied the practices and perceptions of 50 Swedish SLPs about communication partner training with high-technology Speech Generating Devices (SGDs) [27]. The SLPs completed a researcher-made questionnaire about communication partner training respecting the communication partners of children with ID and severe CP. According to the results, 50% of the respondents received ≤1 training session with communication partners in the last year. One-third of the respondents never used documents for goal-setting; another half seldom or never taught communication partner strategies, and three quarters only used verbal instructions [27].

Chua et al. described the perceived competence, pre- and post-professional training, and the practice of Filipino SLPs in AAC by printed and electronic questionnaires [28]. The relevant results demonstrated that 71% of respondents practiced AAC; however, most of them failed to perceive selves to be capable of working with different clients who had complex communication needs. Furthermore, 70%-93% of the participators reported limited

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pre-professional training in all aspects of AAC content; at least 82% highly requested continuing education in all dimensions of AAC. Approximately, 90% of the respondents recommended AAC only rarely or occasionally. The negative attitudes of families toward AAC services and the lack of AAC-specific interdisciplinary collaboration were reported as major practice challenges [28].

Despite the increasing awareness of ACC and its usefulness in the last 4 decades, there are numerous clinicians in rehabilitation centers with the inadequate capacity to provide evidence-based AAC services. The disorders that affect verbal communication regarding speech and language pathology, and the role of SLPs in providing AAC services are of significance; however, it is undiscovered that to what extent are SLPs aware of the importance of AAC services and their requirements. According to the literature, there is no study on AAC services in Iran. Therefore, the current study aimed to explore the rate of awareness and familiarity of Iranian SLPs with AAC services and their methods. We also assessed Iranian SLPs' viewpoints on the efficiency of AAC services per candidate group. The ultimate goal was to investigate the necessity for the Iranian SLPs to receive further education about AAC services and their prerequisite.

2. Methods

In total, 111 research participants were recruited from SLPs who attended the 14th national annual conference of speech therapy in Tehran City, Iran (April 2016), by convenience sampling method. All study subjects had at least a BA degree; at least one year of work experience in public or private rehabilitation centers; and a history of visiting clients who completely failed to communicate through speech. All study participants provided signed written informed consent forms and were assured of the confidentiality of personal data. The data of none of the study participants were excluded from the analysis; thus, the information of 111 participants was included in the final data analysis. The Ethics Committee of the University of Social Welfare and Rehabilitation Sciences approved this study.

The required data were collected by a researcher-made questionnaire. In designing the questionnaire, we first used a questionnaire developed by Hartig and Danny in 2006 [1] to assess nurses' needs about complementary and alternative communication services as a sample. Furthermore, we extracted the content of questionnaires applied in other similar studies [29]. Besides, we interviewed clinicians who were members of the medical rehabilitation team, including speech therapists; rehabilitation engineers; occupational therapists; physiotherapists;

nurses, and physicians. Then, we designed a 14-item inventory as per the objectives of this study. The scale was categorized into two sections; personal information and questions about AAC. The content of AAC questions included the level of SLPs' familiarity with the term AAC; the patients who can benefit from AAC methods, and the approaches of obtaining information about AAC. At the end of this questionnaire, several groups who required AAC services were introduced; accordingly, the respondents were required to share their viewpoints on the effectiveness of AAC services per group, based on a Likert-type scale.

The content and face validity of the questionnaire were assessed by 10 experts who had PhD or MSc in speech therapy. The scale's Content Validity Ratio (CVR) was estimated as 67.31 according to Lawshe's formula.

The study participants were requested to complete the printed questionnaire, entitled "Investigating the Level of Awareness of Iranian SLPs about AAC". The completion time was estimated to be approximately 15 minutes. The obtained data were analyzed by SPSS v. 21.

3. Results

Table 1 presents the demographic characteristics of the explored SLPs (N=111). As per Table 1, 61.3% of the respondents had a BA degree. Moreover, 62.2% of the study participants had 1-5 years of work experience in rehabilitation centers. Most of the study respondents were women (73.9%). The level of SLPs' familiarity with AAC services and their encounters with PWCPs and were subsequently candidates for receiving AAC services are demonstrated in Table 2.

The collected results signified that only 32.4% of the respondents had high or very high familiarity with AAC; 0.9% of them did not even know the term AAC, and 20.7% had a low level of familiarity with this concept. However, 92.8% of the study samples reported the experience of visiting individuals who had communication difficulties. The methods of gaining familiarity with AAC are summarized in Table 3.

As demonstrated in Table 3, 51.4% of the clinicians who were familiar with AAC services had obtained this familiarity through educational workshops. Reading texts and attending congresses were the least frequent ways of obtaining such knowledge.

Next, the explored SLPs' level of familiarity with AAC systems and the possibility of providing any of these sys-

Table 1. The demographic characteristics of speech-language pathologists

Participants	Gender		Degree			Work Experience					
	Male	Female	Bachelor	MSc	PhD	1-5 Years	6-10 Y	11-15 Y	16-20 Y	More than 20 Y	Total
No. (%)	29 (26.1)	82 (73.9)	68 (61.3)	38 (34.2)	5 (4.5)	68 (62.2)	23 (19.8)	9 (8.1)	2 (18)	9 (8.1)	111 (100)

Table 2. The level of SLPs' familiarity with AAC services and their encounters with PWCP

Participants	Exposure with PHCP		Familiarity with AAC Services				
	Yes	No	Never	Low	Middle	High	Very High
No.	103	8	1	23	51	27	9
%	92.8	7.2	0.9	20.7	45.9	24.3	8.1

tems to their clients were probed. The related results are summarized in Table 4.

The obtained results suggested that 86.5% of the explored SLPs were familiar with low-tech AAC devices; only 0.9% of them were familiar with high-tech electronic devices. Furthermore, 67.6% of the studied SLPs believed that providing AAC services is possible; only 0.9% of them stated that using high-tech AAC services is impossible for their clients (Table 4).

Table 5 demonstrates the investigated SLPs' viewpoints about the effectiveness of AAC services for those in need of such services.

The investigated respondents believed that the effectiveness of AAC services in disorders, such as ASDs, aphasia, traumatic brain injury, and CP was more than that in other disorders, including IDs, motor disability, myasthenia gravis, and hearing impairments (Table 5).

The results of the items regarding the explored SLPs' viewpoints on the possibility of providing learning opportunities; taking specialized university courses in AAC

Table 3. The methods of gaining familiarity with AAC

Participants	Methods of Familiarity				
	Reading Text	Educational Workshops	Seminars or Congress	Combination of Options	None
No. (%)	23 (20.7)	57 (51.04)	12 (108)	13 (11.7)	6 (5.4)

Table 4. The SLPs' level of familiarity with AAC systems and the possibility of providing them to clients

Measures	High-tech Devices	Low-tech Devices						None
	Electronic Devices	Paper and Pen	Communication Board	Sign Language	Pictural Communication Board	Lip-reading	Combination of Them	
Level of familiarity*	0.9	0.9	7.2	0.9	2.7	0.9	86.5	0
Possibility of providing*	0.9	0.9	1.8	2.7	3.6	0.9	56.8	27.9

* %

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Table 5. The effectiveness of AAC services for groups who need these services based on SLPs' points of view

levels	CP[1]	Autism	MR[2]	Motor disability	HL[3]	Aphasia	TBI[4]	SCI[5]	cancer	MD[6]	HD[7]	ALS[8]	Myasthenia Gravis	Dementia
Nothing	1.8	1.8	2.7	2.7	3.6	0.9	0.9	2.7	1.8	1.8	2.7	1.8	1.8	2.7
Little	6.3	7.2	18.9	17.1	16.2	1.8	2.7	9	11.7	13.5	11.7	8.1	17.1	12.6
Middle	24.3	17.1	26.1	22.5	26.1	24.3	24.3	21.6	19.8	22.5	28.8	28.8	26.1	24.3
High	35.1	34.2	34.2	32.4	26.1	31.5	35.1	24.3	22.5	23.4	18	19.8	19.8	19.8
Very high	26.1	36.9	13.5	20.7	20.7	36	26.1	22.5	18.9	18	13.5	19.8	15.3	20.7
Not knowing	2.7	1.8	2.7	2.7	4.5	2.7	5.4	13.5	18.9	14.4	18.9	14.4	14.4	14.4
No answer	3.6	0.9	1.8	1.8	2.7	2.7	5.4	6.3	6.3	6.3	6.3	7.2	5.4	5.4
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100

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Equation [1] cerebral palsy, [2] IDs, [3] Hearing loss, [4] Traumatic brain injury, [5] Spinal cord injury, [6] Muscular dystrophies, [7] Huntington disease, [8] Amyotrophic lateral sclerosis.

training, and informing patients about AAC services are presented in Table 6.

As observed in Table 6, 88.3% of the respondents were willing to have more educational opportunities respecting AAC services; 94.6% of them agreed to take specialized university courses. Furthermore, 65.8% of the study respondents could provide these services and 91% informed their clients of them.

4. Discussion

This research was conducted to investigate the awareness of SLPs about AAC services using a researcher-made questionnaire. This inventory included 14 questions, i.e., divided into 6 general domains. The content of these 6 domains was as follows: the level of SLPs' familiarity with AAC services and the possibility of pro-

viding any of these systems to their clients; the level of SLPs' encounters with individuals who had communication problems and were candidates for AAC services; the manners of gaining familiarity with AAC systems and methods; SLPs' viewpoints on the effectiveness of AAC services for people in need of these services, and SLPs' viewpoints on the possibility of providing learning opportunities; taking specialized university courses for AAC training, and informing patients about AAC services. The obtained data revealed that relatively few (8.1%) explored SLPs were familiar with AAC services. However, most of them (92.8%) had clients with communication problems who required AAC services. Additionally, clinicians who were familiar with AAC concepts had learned them by participating in educational workshops and congresses, and reading texts; thus, these methods insignificantly impacted the awareness of the investigated SLPs regarding AAC services.

Table 6. The study subjects' viewpoints on the possibility of providing opportunities for learning AAC services, taking specialized university courses in AAC training, and informing patients about AAC services

Response	Possibility of Providing the Services	Learning Opportunity	Adding Specialized Unit	Informing Patients
Yes	65.8	88.3	94.6	91
No	32.4	9	3.6	6.3
Missing	1.8	2.7	1.8	2.7
Total	100	100	100	100

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Another important finding was the level of familiarity with various AAC services. Most of the study subjects stated being familiar with low-tech devices with limited services; only a few of them mentioned being familiar with high-tech (electronic) and advanced devices. However, particularly for speech-motor disorders, the latter tools can significantly alter the communication styles of individuals with CP-induced dysarthria. These data are concordant with those of the previous studies [22, 24, 28, 30] The only study in which the respondents were familiar with AAC services belonged to Lacono and Cameron [26]. In 1998, Lacono investigated the awareness of SLPs about AAC services. Subsequently, 11 years later, in 2009, he re-conducted the same research; comparing the results of these two studies highlighted that receiving training about AAC services had changed the viewpoints of SLPs about these services and their efficiency.

Concerning the effectiveness of AAC services in the candidates for receiving AAC services, the respondents found using these services very helpful; particularly for disorders such as ASDs, aphasia, Traumatic Brain Injury (TBI), and CP. that the investigated SLPs seemed to be unfamiliar with disorders that could benefit from AAC services. All of the diseases mentioned in the questionnaire cause severe conditions concerning the production and comprehension of language. Thus, they make individuals with these diseases candidates for receiving AAC services. Moreover, several study subjects believed that these services provide slight efficiency in diseases, such as IDs, motor disability, myasthenia gravis, and hearing impairments. These findings suggested that SLPs are unfamiliar with the target population that may benefit from AAC services; thus, they should receive further training. However, numerous respondents reported being engaged in clinical work associated with PWCPs as well as potential candidates for receiving AAC services. These results are consistent with those of Lacono and Cameron [26] as well as Marvi and associates [22]. Based on the achieved findings, AAC is effective from SLPs' perspectives. Providing training for SLPs about the methods of applying these services in rehabilitation centers to patients with different disorders is necessary.

Most of the explored respondents in this research were willing to further learn about AAC services. They believed that AAC should be taught in workshops as well as educational courses to graduates. The obtained data indicated that SLPs were interested in further learning about these services as well as participating in related courses. Therefore, we suggest that the officials in charge take necessary steps in providing advanced and high-tech devices to make SLPs more familiar with AAC services.

5. Conclusion

According to the current study findings, numerous SLPs have clients with communication needs and problems; however, their level of AAC-related awareness and its efficiency is insufficient. The positive point, however, is that numerous respondents were interested in learning more about AAC services and identifying potential candidates for using these services. We suggest further studies on a larger and broader population to generalize the relevant results to all SLPs in Iran.

Ethical Considerations

Compliance with ethical guidelines

The written informed consent form was obtained from all research participants before enrollment in this study. This study was approved by the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences.

Funding

Authors' contributions

Conceptualization: Talieh Zarifian, Maryam Malekian; Methodology: Talieh Zarifian, Maryam Malekian; Investigation: Talieh Zarifian, Maryam Malekian; Writing – original draft: Talieh Zarifian, Maryam Malekian; Writing – review & editing, Resources, Funding Acquisition, and Supervision: Talieh Zarifian, Maryam Malekian, Tabassom Azimi.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgments

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