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The use of augmentative and alternative communication in educational settings in the Basque Autonomous Community (Spain)

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ABSTRACT

Augmentative and Alternative Communication (AAC) refers to all forms of communication that can be used to support people with little or no functional speech. The present study was part of a broader European project that aimed at gathering information about the service provision in AAC in the Basque Autonomous Community, Spain. One hundred and fifty-three professionals in special education completed an electronically distributed questionnaire comprising 19 questions that were divided into three sections: background information, participants' AAC practices, and AAC specific training. The findings from the analysis revealed that most of the participants have used systems of AAC at some point in their professional lives. Some participants reported not using AAC systems due to a lack of knowledge, but most of them specified that they did not stop using them once they had started. We found that participants rely on a variety of AAC systems with the most used being communicative apps and software, along with printed communication tables and self-created instruments. Data suggest that professionals use low-tech self-created materials, and this may be related to the fact even though most of the participants received some type of short training they reported that it was insufficient.

Introduction

Augmentative and Alternative Communication (AAC) refers to all forms of communication that can be used to support people with little or no functional speech, so they can communicate with others (Glennen and Denise 1997). In a broad sense, it refers to the set of strategies, including technological devices that promote the autonomy of individuals with special communication needs (McNaughton and Light 2013). According to Beukelman and Pat (2013) unaided AAC does not require any external equipment or technology (e.g. gestures, signs, eye blink codes, etc.) whereas aided AAC does require some form of equipment. Additionally, aided AAC includes low and high-technology options. Low-technology options include communication boards or picture exchange systems whereas high-technology options include computer-based speech-generating devices (SGD), mobile technologies (tablets and phones) and a wide range of AAC applications (Beukelman and Pat 2013).

Literature shows that AAC assessment is crucial for providing effective services (Binger et al. 2012; Wilkinson and Rosenquist 2006). However, professionals often feel that they are not prepared for carrying out this provision of AAC (Lynda et al. 2003; Sutherland, Gillon and Yoder 2005), and very limited training is provided by tertiary programmes in different parts of the world (Aileen and Light 2010; Douglas, West and Kammes 2020; Kent-Walsh, Stark and Binger 2008), including the BAC. Further, the rapid growth of high-tech AAC technology for individuals with communication difficulties is unprecedented and yet research in this area is inconclusive. Thus, there is a concern whether these newly developed technologies may (i.e. high-tech AAC) have a limited functional usage (Baxter et al., 2012).

Focusing on the AAC practices in Spain, Pereira et al. (2019) have recently published a study compiling educational practices carried out in Spain using AAC systems in the last decade. Yet, none of these studies was focused in the BAC. The results of their review show the overall positive outcomes of applying AAC systems to people with disabilities such as cerebral palsy, intellectual disabilities or autism, but also to people with a variety of communication difficulties. In fact, their results show that AAC systems improve both the beneficiary's autonomy and social abilities, thus benefiting society as a whole. Among the 25 case-studies analysed, it was found that most studies utilised high or low-tech AAC systems and that only a few made mixed use of them throughout the interventions.

The 19 communities that comprise Spain act under the same Spanish educational Law (LOMCE). However, each community kept the competence of organising the education system. Among a wide variety of competences, each community needs to adopt the measures required to identify alumni with specific learning difficulties and value their needs (LOMCE, 19359). Therefore, there are differences, for example, in the schooling criteria of a student with special educational needs (SEN), and rates of schooling in mainstream education vary among territories (Ministry of Education and Vocational Training, n.d). In addition, in the BAC, SEN students in secondary education (from 12 to 16 years of age) who require highly individualised attention and intensive and continuous

resources to develop a curriculum that departs significantly from that of the other students are enrolled in specific learning spaces or classrooms named 'Stable rooms'. Additionally, 'Task-based learning classroom' (from 16 to 20 years of age) is focused on promoting personal, social and professional competences of students with SEN.

Even though AAC has been used for over 60 years across many countries and their positive benefits for people of all ages have been extensively documented (Beukelman and Pat 2013) no research has been conducted in the BAC. This study was part of a broader European project that aimed at gathering information about the use and training required by professionals in AAC. Thus, we tried to articulate the interests of the seven state members in the project to design this study and to contribute in extending the body of knowledge on AAC practices, whilst portraying the situation in the Spanish region of the Basque Autonomous Community (BAC).

The present study aims to gather descriptive information regarding current AAC practices, addressing two main research questions:

Research Question 1: How do professionals use on AAC in educational centres?

Research Question 2: What training related to AAC have these professionals received?

Research Question 3: Is there a relationship between the amount of training received by professionals and the use of AAC?

Method

Data collection and analysis

The questionnaire was submitted as a link via email to the 18 *Berritzegunes* of the BAC who then forwarded it to the educational professionals in the education centres in the three provinces that comprise the BAC. The entities for Educational and Psychopedagogical Orientation in the BAC are known as *Berritzegunes* and belong to the Education Department of the Basque Government. These are established as public external support services for innovation and improvement of education at the levels of non-university education in the BAC. There are similar services in other communities in Spain even if they are called differently. Professional from different backgrounds (psychologists, occupational therapists, physiotherapists, speech therapists, etc.) collaborate with schools' staff in the diagnosis of students.

The *Berritzeguneak* serves all schools, both public and private, of the BAC. Each *Berritzegune* serves schools in a geographic area. These *Berritzeguneak* forwarded the questionnaire by email to the educational professionals in the mainstream and especial education centres. The total number of returned questionnaires after the two phases of recruitment was 468, of which 153 meet the inclusion criteria. The criteria to include/exclude participants were defined as educational professionals from infant, primary, secondary and vocational education in the BAC, working directly with students who have special educational needs. Incomplete questionnaires were discarded.

The email included an information letter in the main body as well as information about the purposes, the importance of the study, and the protection of personal data. At the beginning of the questionnaire, the participants were told that the completion of the questionnaire implied that they were given their consent to participate in the study. The questionnaire was available online from November 2018 to January 2019 and the *Berritzeguneak* sent a reminder with an interval of two months via email to educational professionals to maximise the response rate.

A descriptive analysis of the extracted data was generated so as to explain participants' profile, their use of AAC and the training received. In addition, correlational analysis was

used to describe the relationship between the amount of training received by the participants (Items 17-18) and the overall use of AAC (Item 9; see Appendix A). All analyses were conducted using SPSS® statistical software package (version 26, IBM® Company, Armonk, NY, USA).

Participants

This study includes 153 educational professionals from the BAC. The mean age of the participants is 42.9, with 141 women (92.2%) and 12 men (7.8%). The sample was divided into six professional profiles: 1) special education teachers (n = 65; 42.5%), 2) advisors/counsellors (n = 35; 22.9%), 3) educational support specialists (n = 15; 9.8%), 4) speech-language therapist (SLTs; n = 15; 9.8%), 5) occupational therapists (n = 6; 3.9%) and 6) out-of-school services (n = 8; 5.2%). In addition, we offered the possibility of choosing the option 'others' (n = 9; 6%) for cases that did not fit the aforementioned profiles. From those professionals, the 44.4% (n = 68) work in mainstream schools and 55.6% (n = 85) in special education centres.

Regarding participants' job, 44.4% (n = 68) of the participants were located in mainstream schools and 55.6% (n = 85) in special education centres. More specifically, 80.4% (n = 123) of these professionals intervene in regular classrooms, 15% (n = 23) in 'stable rooms' (from 12 to 16 years of age) or rooms for students with SEN, and 4.6% (n = 7) in Task-based learning classrooms (from 16 to 20 years of age).

As far as educational levels go, 13.1% (n = 20) work in infant education (from 2 to 6 years of age), 59.5% (n = 91) in primary education (from 6 to 12 years of age), 19.6% (n = 30) in secondary education (from 12 to 16 years of age) and 7.2% (n = 11) in vocational training.

Instrument

The questionnaire was elaborated and reviewed first by the authors of this article and then by two experts from the *Berritzeguneak*. It was piloted among 20 professionals during 2 weeks, and these professionals' comments were included in order to improve the instrument. The aims to pilot the questionnaire were: a) to ensure the wording, b) to check whether the questionnaire was perceived as an efficient instrument to gather the information it was supposed to (face validation) and c) to confirm that the instrument was valid (content validation) (see also Bill 2008).

The questionnaire consisted of 19 questions divided into three sections: I. Background information, II. Participants' AAC practices and III. AAC specific training undergone. In order to minimise the time of completion, most of the questions had multiple-choice answers (Bill 2008). Specifically, questions from 10 to 16 were a multiple-answer multiple-choice question (see Appendix A). The questionnaire was provided in Basque and Spanish, and professionals could choose the language of their preference.

In section II. Participants' AAC practices, participants that answered 'never' in question nine did not answer the following five questions in this section. Therefore, only 86.3% of the total sample (n = 132) who reported using AAC systems answered questions 11-16. Those who answered 'never' (13.7%; n = 21) only completed question 10 of this section (see Appendix A).

Question 12 concerns the use of AAC systems according to the beneficiary profile. As mentioned at the beginning of this article, the study presented here is part of a broader European project that aimed at promoting social inclusion using AAC in schools. As part of

this project, each member (institutions in seven European countries) had to make a report on the situation of education in their country and specifically on the use of AAC. This list of 13 types of disabilities is the result of the merger of the seven reports. The option ‘others’ was also added as an open question.

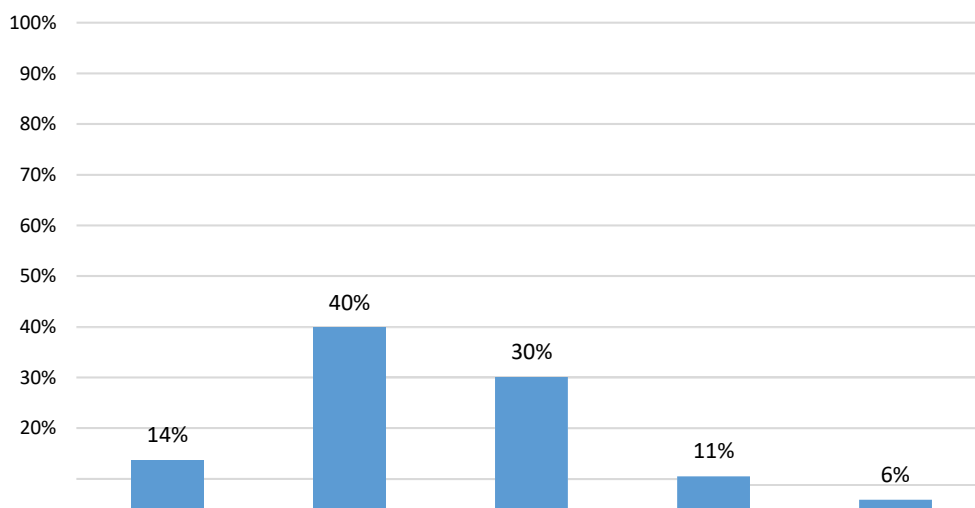
Questions 13, 14, 15 and 16 are related to types of AAC. For the purposes of this report and following the recommendations of the experts from the *Berritzeguneak*, we choose specific options for the aided and unaided AAC systems that are widely used in the BAC. We classified AAC systems as unaided (i.e. Sign Language and Total Communication System) and aided AAC systems which rely on external objects. Total Communication

System includes two components that define it as such: Speech Signed and Simultaneous Communication (see also Ministry of Education and Culture of the Region of Murcia 2001) and are widely used in the education system of the BAC. Additionally, aided systems were classified as high-tech and low-tech (see also Beukelman and Pat 2013) (see Appendix A). Section III regarding AAC training (questions 17-19) consists of three questions (see Appendix A) that were answered by the whole sample (n = 153). The question regarding the type of training includes five options and a box to specify the name of the organisation that provided the training (see Appendix A). Masters are specialised university programmes while course refers to non-university theoretical-practical training. Further, seminars or workshops are specialised meetings, with a technical or academic nature. Finally, conferences are aimed at professionals, parents and people who are interested in the topic while academic congresses have a scientific focus.

Results

The use of systems of augmentative and alternative communication

With respect to the use of AAC by education professionals, participants were requested to answer on a Likert scale from 1 (never) to 5 (always). Thus, as it is shown in Figure 1, 13.7% (n = 21) of the respondents answered that they never use AAC, 39.9% (n = 61). Among the reasons not to rely in AAC, 28.6% of the participants (n = 6) indicated lack of knowledge. A few indicated lack of coordination among professionals (9.5%; n = 2), lack of time (4.8%; n = 1) and unwillingness of the families (4.8%; n = 1). The majority of the participants indicated ‘other reasons’ and reported that so far they had no need to use AAC.



10%

0%

Never

Sometimes

Usually

Almost always

Always

Figure 1. The use of AAC systems (n = 153). 1: Never; 2: Sometimes; 3: Usually; 4: Almost always; 5: Always.

Instead, 86.1% (n = 132) of the participants reported to have used AAC at some point, with the majority using them sometimes (n = 61) or usually (n = 46). Fewer participants reported using AAC almost always (n = 16) and always (n = 9).

Participants were also asked about the barriers they perceived in the use of AAC. As it can be seen in Figure 2, the lack of time (n = 101) was the most common barrier, followed by difficulties in adapting the instrument students' specific needs (n = 58), the lack of economic resources (n = 42) and the lack of qualified professionals (n = 40). Over a third of the participants reported to have 'other barriers' (n = 58) as well.

Figure 3 shows the use of AAC as related to the target profile. Participants reported to use AAC mostly with students with autism spectrum disorders (n = 87), speech/language disorders (n = 85), cognitive impairment (n = 62) and learning disorders (n = 60; dyslexia, ADHD, etc.). Around one-third of the participants use AAC with students with mobility impairment (n = 46), development disorders (n = 44) and with students that were not diagnosed but had SENs (n = 44). The use of AAC with students with visual impairment (n = 40), students with various difficulties (n = 38) and foreign students (n = 26) was somewhat lower. Finally, AAC was not widely used with students with emotional/personality disorders (n = 13).

The last question requested the respondents to report which kind of AAC systems they used. As seen in Table 1 participants applied either unaided or aided AAC systems. The use of aided systems was higher than the use of unaided system, almost all participants reporting to use them. Among unaided AAC communication systems, sign language was the most used unaided communication system applied by almost one-third of the participants. Some participants also reported to use the Total Communication System.

Most of the participants claimed to use low-tech systems. From these participants, almost three quarters reported creating their own materials, including didactic materials, timetables, adapted tales, calendars, social stories and adapted songs. Over half of the participants also reported to use communication boards and, finally, just over one-quarter

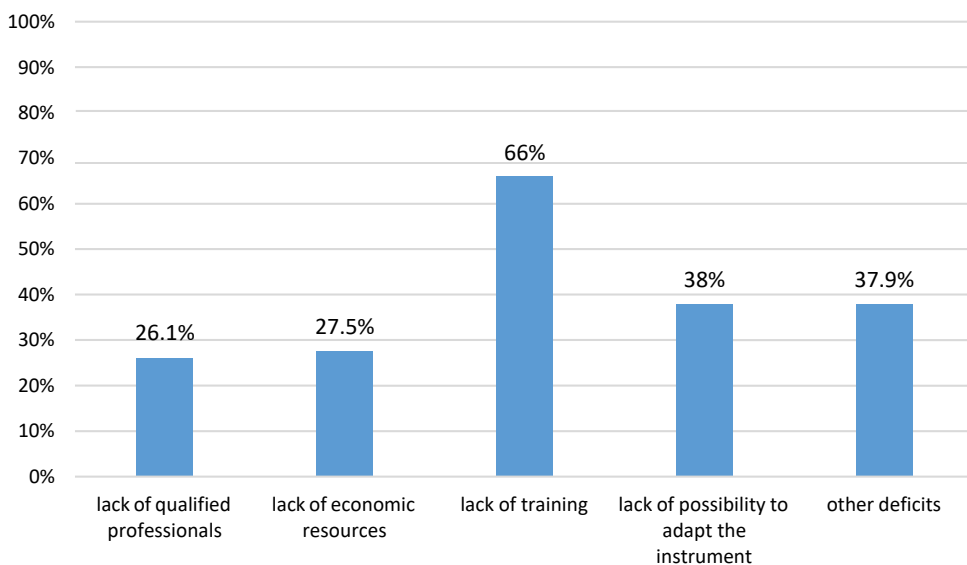


Figure 2. Barriers in the use of AAC systems (n = 132).

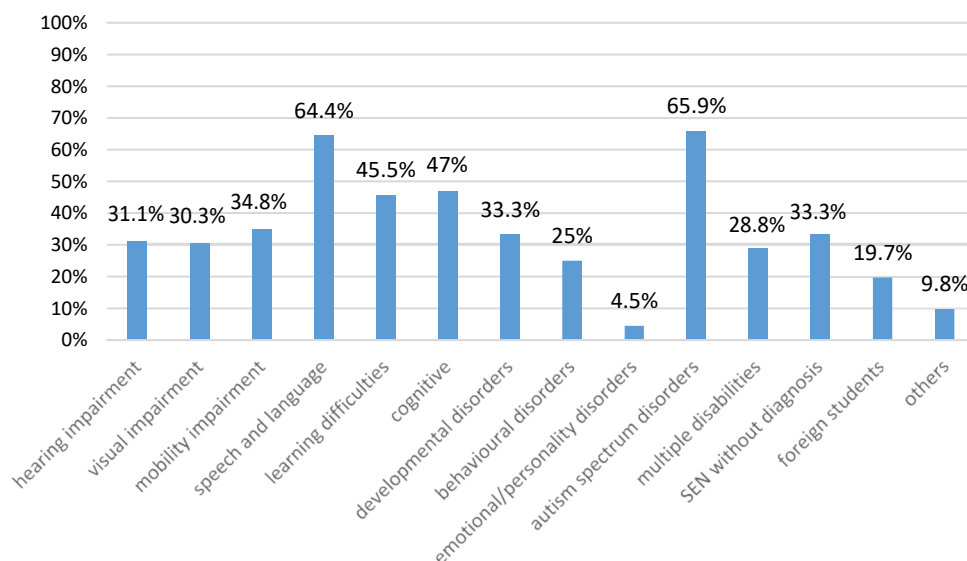


Figure 3. The use of AAC systems according to the beneficiary profile (n = 132).

of the participants indicated other options, predominantly picture exchange communication systems (PECS).

Most of the participants claimed to be using high-tech systems as well. As shown in Table 1, communication apps and software appeared to be most commonly used among participants and more than a quarter appeared to use speech (or text) generating devices (SGD). In the open-question on the type of communication apps and software used, the following answers came up: ARASAAC (ARASAAC 2020), Grid, Kinestem, Irisbond, Picto4me, Let me talk, Plaphoons, Soy visual, Pictotraductor, Araword, eMintza and Hitziki.

Augmentative and alternative communication training

With respect to the second research question, we present the results obtained concerning the training in AAC received by the participants. In order to go deeper into the training

Table 1. Type of AAC systems used by the participants (n = 132).

AAC systems	n	%
Unaided systems	85	64.4
Sign language	42	31.8
Total Communication System B. Shaeffer	21	15.9
Other	22	16.7
Aided systems	126	95.5
<i>Low-tech AAC systems</i>		
Communication boards	74	56.1
Self-created materials	98	74.2
Other	22	16.7
<i>High-tech AAC systems</i>		
Communication apps and software	108	81.8
Speech or text generating devices	37	28

that professionals received, we first present information about general training within the field of special education. As shown in Figure 4, most of the participants reported having received more than 300 hours of training. In fact, very few received less than 300 hours of training related to special education: 14 participants between 100 and 300 hours, 14 between 50 and 100 hours, 9 between 30 and 50 hours, 3 between 15 and 30, 3 between 5 and 15, 1 between 1 and 5 hours, and 5 had received no training.

As shown in Figure 5, 45.8% of the participants ($n = 70$) indicated that they had not received any training on AAC systems. Among participants who had received training, 13.7% ($n = 21$) had received between 1 and 5 hours of training, 9.2% ($n = 14$) between 5 and 15, 12.4% ($n = 19$) between 15 and 30, 7.8% ($n = 12$) between 30 and 50 hours, and 5.9% ($n = 9$) between 50 and 100 hours. Only 2.6% of the participants ($n = 4$) chose the option between 100 and 300 and another 2.6% ($n = 4$) the option '300 hours or more'.

As we can observe in Figure 5, slightly less than half of the participants ($n = 70$) indicated that they had not received any training on AAC systems. Among the participants who had received training, most of them had received between 1 and 5 hours of training ($n = 21$) or between 15 and 30 hours ($n = 19$), and very few had received more than 100 hours.

In addition, the relationship between the use of AAC and the training received by the participants was investigated using Pearson correlation coefficient. We found weak positive correlation between the use of AAC and specific training in AAC, $r = .38$, $n = 153$, $p < .001$ while no correlation was found between the use of AAC and the training in special education, $r = .21$, $n = 153$, $p < .05$.

Finally, regarding the nature of the training received, one-third of the participants reported to have received some type of course (34%; $n = 52$) (i.e. theoretical-practical training received outside the university), and about a quarter had attended conferences (17%; $n = 17$) or seminars and workshops (15%; $n = 23$) related to AAC. Yet, very few

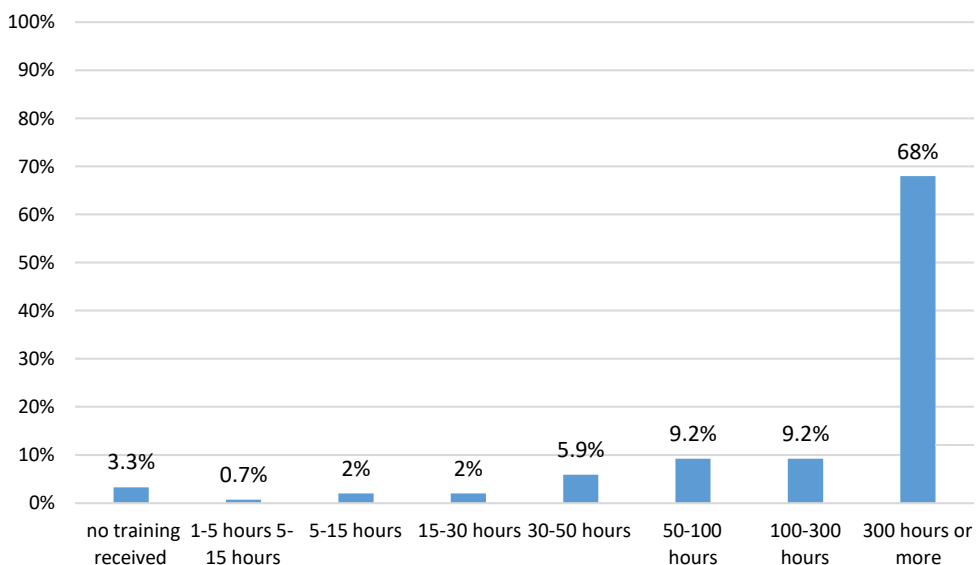


Figure 4. Training in special education ($n = 153$).

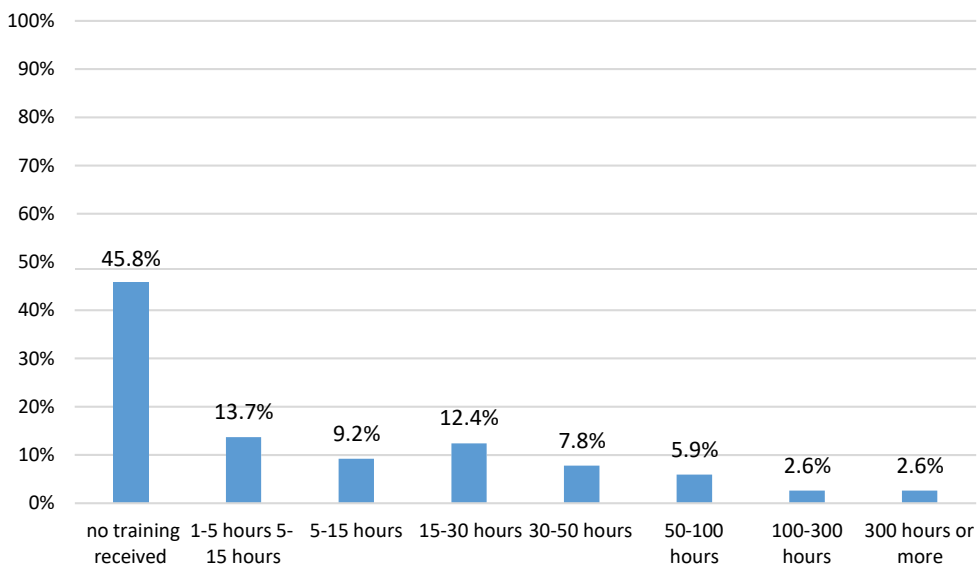


Figure 5. Augmentative and alternative communication training (n = 153).

reported to attend academic congresses (2%; n = 3) (i.e. regular meetings with an academic focus), and only 9.8% (n = 15) of the participants reported to hold a university degree (master's degree or a doctorate) related in some way to AAC.

Discussion

The findings revealed that most of the participants reported using AAC regularly. Data suggest that AAC systems in the Basque Autonomous Community cover a broad spectrum of SEN (Light and McNaughton 2012; Lynch, McCleary and Smith 2018) and points to the versatility of such instruments.

Regarding the type of instruments the participants apply, our results show the multi-modal nature of AAC (Light and Drager 2007) since they tend to mix aided and unaided AAC systems in their professional practice, which is important in enabling a person explain her or himself correctly (Beukelman and Pat 2013). This finding contrasts with the fact that most research in Spain is done without mixing the use of AAC systems (Pereira et al. 2019). Therefore, there may be a gap between how research in AAC is conducted, and how professionals use these AAC systems in their everyday teaching practice.

Additionally, the vast majority of the professionals reported using communication apps and software. We consider this finding related to the fact that despite the high price, technology is becoming more accessible (Banda and Alzrayer 2018) as these assistive technology (AT) tools are available in many schools of the BAC and other parts of the world (Eliada, Theodorou and Petinou 2018). Furthermore, Van der Meer et al. (2012) found that users might learn some high-tech AAC systems with dynamic screens faster because they are easier to teach. Among the low-tech instruments, we found that AAC systems made by the professionals themselves were the most common followed by

communication boards. In contrast, the least used AAC systems were the unaided systems (e.g. sign language). This finding may be related to the fact that the former does not require in-depth, specific knowledge, whereas this is not so for manual symbols such as sign language (Glennen and Denise 1997).

It is interesting to analyse this finding in relation to the results of the second research question, which aims to explore the training in AAC received by professionals. Our results show that, in most cases, this training was short and this can be related to the fact that 'lack of specific training in AAC systems' was identified as the major deficit among participants, which in turn may negatively influence the quality of the services provided (Aileen and Light 2010; Dietz et al. 2012).

Even though research shows that life-long training positively influences AAC practices (e.g. Moorcroft, Scarinci and Meyer 2019; Eliada, Theodorou and Petinou 2018) this training does not always occur (Binger and Light 2006; Douglas, West and Kammes 2020; Kent-Walsh, Stark and Binger 2008; Ronski et al. 2015). Many studies highlight that the cost of training related to AAC may prohibit professionals using certain systems (Eliada 2015; Kieron and Hester 2009). Yet, our results show that this was not the case among the professionals of the BAC since very few participants indicated a lack of economic resources as the main reason for not using them. Yet, the data concerning the type of AAC systems show that professionals tend to use the tools that are more affordable. These results highlight the need to reflect on the nature of training so that professionals working with students with communicative needs can innovate in the use of AAC systems and new technologies. In this sense, it is relevant to comment that the majority of the participants had a university degree but very few had received any in-depth training in AAC systems at undergraduate and postgraduate level (Kent-Walsh, Stark and Binger 2008). These results are also consistent with Eliada, Theodorou and Petinou (2018) and may indicate that little attention is paid to this matter at the university level. According to these findings, the training offered at the postgraduate level is still scarce. Therefore, it would be interesting to analyse the curricula of university degrees and postgraduate studies in order to broaden the content related to this topic and thus improve the training of future professionals.

Limitations

The results of this study are limited in several ways, and they must be treated with caution, as we did not gather a representative sample. As abovementioned, this study had a practical objective, which was that of informing the professionals working in the *Berritzeguneak* about the needs regarding training reported by professionals. In this way, the questionnaire was designed from the own interests of these professionals, and we did not use any standardised instrument. Conversely, this study adds to the sparse literature on the topic, informs about AAC practices in the BAC, and acts as an indicative baseline measure for future AAC practices in the BAC.

Conclusions

The aim of the present study was to contribute to the scant knowledge that exists regarding the use of AAC methods in the BAC (Spain). In general, the evidence suggests

that the use of AAC covers a broad spectrum of SEN and its use is consistent among the education professionals responding to the survey. However, the results show that there is a lack of training on these communication methods. In this way, we suggest that it is important that academic institutions offer special training in AAC within tertiary programmes as well as life-long learning in order to cope with the demand for knowledge of the different systems. This training, however, should offer evidence-based services and be designed (and maybe coordinated) with the special education institutions and professionals working in the external centres (i.e. Berritzaguneak) considering the specific needs they find in the educational contexts of the BAC. In this way, a more meaningful use of AAC in natural contexts would be ensured. In regard to future research, it could be particularly worthy to analyse professionals' specific demands of knowledge on AAC methods in educational contexts.

Disclosure statement

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Appendix A. The questionnaire

Section I: Background information

(1) 1. Gender

- Female
- Male
- Non binary

(1) 2. Age _____

(2) 3. Professional profile

- Special education teacher
- Advisor/counsellor
- Educational support specialist
- Hearing and speech specialist
- Occupational therapist
- Outdo school services
- Other _____

(1) 4. What is the highest degree you have received?

- Vocational training
- Bachelor degree
- Master degree
- Postgraduate studies
- PhD

(1) 5. How many years of professional experience with students with special education needs do you have?

- 2 or less years
- Between 2 and 5 years
- Between 6 and 10 years
- Between 11 and 20 years
- Between 21 and 29 years
- More than 30 years

(1) 6. Type of school

- Mainstream education
- Special education centre

(1) 7. Level of education

Infant education
 Primary education
 Secondary education
 Vocational education

(1) 8. Educational stage

Ordinary classroom
 Stable rooms
 Task-based learning classrooms

Section II: AAC practices

(1) Do you use AAC in your work?

Never
 Sometimes
 Usually
 Almost always
 Always

(1) Which are the reasons not to use AAC?

Lack of knowledge
 Lack of time
 Unwillingness of the families
 Lack of coordination among professionals
 Other reasons _____

(1) What are the barriers you see in the use of AAC?

Lack of training
 Difficulties to adapt the instrument to the specific needs
 Lack of economic resources
 Lack of qualified professionals
 Other barriers _____

(1) If you have ever used AAC, specify with what type of special need.

Hearing impairment
 Visual impairment
 Mobility impairment
 Speech and language
 Learning difficulties
 Cognitive
 Developmental disorders
 Behavioural disorders
 Emotional/personality disorders
 Autism spectrum disorders
 Multiple disabilities
 SEN without diagnosis
 Foreign students
 Others _____

(1) What type of AAC systems have you used?

Unaided AAC systems (sign language, gesturing and physical cues)

Aided AAC systems (e.g. external objects)

(1) What type of unaided AAC system have you used?

Sign language

Total Communication System Benson Shaeffer

Others _____

(1) What type of aided low-tech system have you used?

Didactic materials

Timetables

Adapted tales

Calendars

Social stories

Adapted songs

Others _____

(1) What type of aided high-tech system have you used?

Communication apps and software

Speech (or text) generating devices (SGD)

Others _____

Section III: AAC training

(1) Have you ever received any training on special education? If so, how many hours?

No training received 1-

5 hours

5-15 hours

15-30 hours

50-100 hours

100-300 hours

300 hours or more

(1) Have you received any training on AAC? If so, how many hours?

No training received 1-

5 hours

5-15 hours

15-30 hours

50-100 hours

100-300 hours

300 hours or more

(1) Type of training

Master (Official Masters, Own degrees, etc.)

Course

Seminars or workshops

Conference

Academic congress

Specify the name of the organisation that provided the training _____