

# Need for Augmentative and Alternative Communication (AAC) in Adult Day Services in Germany—A Nationwide Survey

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## Abstract

The aim of this study was to survey the need for augmentative and alternative communication (AAC) of adults with disabilities and high support needs in adult day services in Germany. In addition to individual data, organizational information was collected. The managers, the group leaders, the AAC specialists and the staff of all adult day services in Germany were invited to participate in an online survey. 91 staff members from 50 institutions provided information on 719 individuals in their care. From these staff members perspective 75% of the 719 clients had a need for AAC and 45% were provided with AAC (coverage rate 60%). Non-symbolic communication approaches for beginning communicators (74%) and low-tech communication book, boards, and card (65%) were used significantly more often than high-tech AAC systems (45%). For about three quarters of the people served, the staff was satisfied with the provision of AAC, but for just under a quarter, they were not. The most frequently cited reasons for dissatisfaction were lack of time/personnel, material resources and skills. Also, of the 193 facility managers surveyed, only 45% consider the available resources to be sufficient. There is a need for more nationwide surveys at the levels of society, organization and individual, differentiated by age groups, types of disability and services.

## Keywords

Augmentative and Alternative Communication (AAC), Adult Day Services, Service Delivery, Survey, Prevalence, Demographics, Epidemiology

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## 1. Introduction

Communication as a human right is often justified with reference to the Universal

Declaration of Human Rights, which in Article 19 grants everyone the right to freedom of opinion and expression (cf. [McLeod, 2018](#)). [Mulcair et al. \(2018\)](#) further emphasize, “Not only is communication a human right, it is the essence of what makes us human.” The UN Convention on the Rights of Persons with Disabilities (CRPD) ([United Nations, 2006](#)), with its goal of self-determined and equal participation of persons with disabilities, also emphasizes the importance of communication in the preamble, but also in Article 9 on accessibility, Article 21 on freedom of expression, Article 24 on education and Article 30 on cultural participation. Communication functions here as a medium to enable participation in the different areas. However, people with complex communication needs face serious barriers to participation in situations with personal contact ([Light et al., 2019](#); [Watson, Raghavendra, & Crocker, 2021](#)). Augmentative and alternative communication (AAC) offers possibilities to break down barriers and enable more participation. AAC focuses on the conversational behavior of the communication partners and the use of assistive devices. According to the CRPD, persons with communicative disabilities have the right to AAC in the sense of “the use of sign languages, Braille, augmentative and alternative forms of communication and all other accessible means, forms, and formats of communication of their own choice” (Article 21). Many countries ratified the CRPD, including Germany in 2009. They have committed to providing AAC to people who need it in order to achieve the fullest and most equal participation possible, in line with the International Classification of Functioning, Disability and Health (ICF) of the World Health Organization ([WHO, 2001](#)). The risks of exclusion of people with severe communication disabilities are particularly high in communication societies such as ours, and AAC can increase their participation and thus their inclusion ([Beukelman & Light, 2020: p. 4](#)).

Augmentative and alternative communication is “an area of clinical practice that supplements or compensates for impairments in speech-language production and/or comprehension, including spoken and written modes of communication” ([ASHA, n.d.](#)). AAC intervention involves three essential components: selection and personalization of AAC systems to provide effective communication means, instruction in the strategies and skills that the individual requires to communicate effectively via AAC, and instruction of communication partners ([Beukelman & Light, 2020](#)). Unaided forms of communication include facial expressions, gestures, eye and pointing movements, gestures, spoken language, vocalizations, and individual gesture systems. Low-tech AAC systems include tangible objects, photos, line drawings, pictures, and letters as communication cards, boards, and books. High-tech AAC systems include fixed display speech-generating devices, such as talking buttons and boards, dynamic displays AAC systems, and written language-based electronic aids (cf. [ASHA, n.d.](#)). Any perceived behavior, even unintentional, can be a basis for an interactive connection. So AAC also includes non-symbolic communication approaches ([Kangas & Lloyd, 1988](#)) for beginning communicators ([Beukelman & Light, 2020](#)) and contextual visual supports to en-

hance comprehension (Beukelman & Light, 2020). In this sense, AAC encompasses the entire range of options to expand communication possibilities. However, AAC refers not only to the communication behavior of the person with a disability but in the same way also to the communication of the counterpart and the social-communicative resources, media, and technical aids in the environment. We can consider AAC for people with severe communicative disabilities at different system levels (Bronfenbrenner, 1979), on the level of society, organization, and individuals (persons with disabilities and communication partners).

Previous studies of AAC needs of adults with disabilities also show these levels. Some of those studies took an epidemiological approach at the societal level. For example, in the United Kingdom, Creer et al. (2016) estimated the number of people who could benefit from AAC to be 0.5% of the total population based on a statistical analysis of epidemiological data of those conditions most likely to lead to AAC needs. Also, based on static data, Siu et al. (2010) estimated the need for AAC in Hong Kong, China, to be between 0.18% and 0.27% of the population. Most studies used surveys. Hirdes et al. (1993) collected information on 132,337 adults (15 years and older) in Canada, including 71,900 persons with disabilities in 1986 and 1987 (1993). The prevalence of AAC needs for ages 15-65 ranged from 0.6% to 1.0%. In addition, there is an increase in prevalence for older people up to 4.2% for those aged 85 and over (Hirdes et al., 1993). The prevalence of people in disability-related institutions ranged from 35.6% to 67.6% (ibid.). In Australia, an epidemiological survey in the early 2000s of 3,759 participants in four regions in Victoria showed a prevalence of 0.2% of the population, of whom 44% received speech and language therapy (Perry et al., 2002; Perry et al., 2004). These epidemiological studies estimate the need for AAC or other speech therapy in the general population to be between 0.18% and 0.5%, and higher for older people. However, the statistical evaluations are methodologically rough estimates.

Empirical studies at the level of organizations can provide on the nature of the need and the extent to which the provision meets the needs. In Australia, again in the state of Victoria, a demographic survey in the late 1980s identified a group of 5034 people with a severe communication impairment (excluding those unaware of their environment or deaf) (Johnson & Bloomberg, 1988; Bloomberg & Johnson, 1990), which represents 0.12% of the population. 62.7% were adults. 71% of people with a severe communication impairment had an intellectual disability. In New Zealand, out of 2356 people with intellectual disabilities in 57 residential facilities aged 16 to 86 years, 28.8% of residents had AAC needs, 6.1% of residents with AAC needs communicated unaided, and 4.6% with communication aids (Sutherland et al., 2014). However, less than 25% of the 3062 staff involved in the study reported to have at least some experience in implementing AAC (ibid.).

As in Australia and Canada, most German studies on the need for AAC focused on a federal state or a region. Residential homes, workshops, and adult day services are inpatient facilities for disability support in Germany. Specialized workshops for people with disabilities to offer work for people who cannot find work

in the general labor market. Adult day services provide day care for people with high support needs (more than provided in specialized workshops). Workshops decide whether to offer a place in a workshop to a person with disabilities depending on whether they can meet the support needs within the framework of the care relationship of one caregiver for 12 people with disabilities. Otherwise, the person has the right to a place in an adult day center with a better support ratio. Adult day services in Germany have different organizational forms; some are affiliated with specialized workshops or residential homes, while others are independent organizations.

In Germany, in the year of data collection, 13% of the population had an identified disability, and 9.6% had a severe disability ([German Federal Statistical Office, 2017](#)). 0.5% of the population received state support services of integration assistance in housing because of a significant disability, 0.3% received support services in special workshops for people with disabilities, and 0.04% in adult day services (cf. [BAGüS/con\\_sens, 2016](#)). Besides inpatient services, several outpatient services support people with disabilities in independent living, work in the general labor market, leisure time, or other areas of life. The following organization-related studies in Germany fit into this statistical background.

In the German state of North Rhine-Westphalia, a postal survey of 156 staff in residential facilities for people with disabilities in 2004 revealed that 43% of the residents had not developed spoken language or had an active vocabulary of less than 50 spoken words ([Bienstein & Nußbeck, 2006](#)). A survey of institutions for persons with disabilities in an Eastern German region in 2001 showed a need for AAC in 6.1% of 1097 adults in workshops and 72.4% of 87 in residential facilities ([Aßmann, 2003](#)). In East German states, a questionnaire survey in residential facilities for persons with disabilities showed that 2.3% of 6519 residents needed AAC ([Aßmann, 2014](#)). A study in residential facilities, workshops, and adult day services in the city of Dortmund showed a share of 70% of the 60 persons in care with a need for AAC ([Bosse & Wilkens, 2015](#)).

Even if the different national support structures preclude a generalization of the organization-related surveys, internationally a proportion of up to 70% of the people cared for with a need for AAC in facilities for people with disabilities can be seen. The studies examining the extent to which the AAC supply meets this need come to a proportion of less than 50%. Most previous studies assume a connection between the provision of AAC and the corresponding qualification of caregivers, which was below 25% ([Sutherland et al., 2014](#)). Some studies also examine the connection between the provision of AAC and the availability of related services ([Perry et al., 2004](#); [Hirdes et al., 1993](#); [Johnson & Bloomberg, 1988](#); [Bloomberg & Johnson, 1990](#)), internal and cross-facility networking ([Bosse & Wilkens, 2015](#); [Siu et al., 2010](#); [Perry et al., 2002](#)), and the time and personnel resources ([Bosse & Wilkens, 2015](#)). No studies have investigated other structural framework conditions for the provision of AAC so far.

In Germany, studies examined adult living, working, and educational settings

and found a need for AAC of up to 70% (Bosse & Wilkens, 2015). However, there is a lack of information from the institution where people with high support needs receive services in everyday life in Germany: the adult day services. Given the high need for general support, one might expect a high need for AAC. Moreover, these persons predominantly depend on assistance and thus on interaction and communication in order to avoid social isolation and negative psychological developments and to achieve self-determined participation in social systems and thus quality of life. In this context, institutions, organizations, and social addresses as role expectations for their members (cf. Luhmann, 1995) play a decisive role in enabling or preventing individually relevant and self-determined participation.

Therefore, this study aimed to survey the need for and provision of AAC for adults with severe disabilities and high support needs in adult day services in Germany. Building on the current state of research, this study examined person and cross-person aspects at the levels of organizations and individuals. At the individual level, the research questions related to (a) the need for AAC for people in adult day care facilities in Germany and the extent to which this need was met, (b) how satisfied stakeholders were with AAC provision. At the organizational level, the research questions related to the mandatory institutional structures implemented in adult day services in Germany to ensure adequate AAC services and systems: (c) the qualifications of AAC staff in terms of knowledge, skills, and attitudes, (d) available AAC materials and communication aids, (e) AAC knowledge management within the organization, and (f) AAC strengths, weaknesses, and areas for improvement.

## 2. Method

### Participants

We approached 2697 adult day centers requesting further distribution within the organization to managers, group leaders, AAC coordinators, staff, and family representatives of all adult day centers in Germany to take part in this online survey. They returned valid data sets from 187 managers, 227 group leaders, 234 employees, 70 AAC coordinators, and 12 representatives of relatives from 103 facilities. In addition, 75 employees provided detailed information about 263 people cared for at 43 adult day services. This adds up to a total of 734 participants. Data collection was anonymous, so no informed consent was required.

The study participation from the federal states corresponds to the population shares with deviations of less than two percentage points, except for the second-largest federal state Baden-Württemberg (population share 13.2%, study share 19.0%), and the third-largest federal state Bavaria (population share 15.6%, study share 13.4%). No data were available from the smallest federal state, Bremen, with a population share of 0.8%.

### Research Design

We used an online survey of adult day services to collect the perspectives of different stakeholders, including managers, group leaders, AAC coordinators,

staff members, and representatives of the relatives. Data collection was anonymous, so no ethics vote was required. Participation in the online survey implied informed consent.

### **Materials**

For each target group, we developed an online questionnaire and one for the AAC situation of the cared-for persons to evaluate the implementation of AAC in the adult day center. From previous research, we developed pre-established analysis categories for organizing the questionnaires. We asked managers, group leaders, staff and AAC coordinators questions about knowledge and use of AAC, networking, cooperation, assessment, intervention, facilitators, barriers, strengths, and weaknesses. Additional questions for managers related to infrastructure. Group leaders, employees, and AAC coordinators were able to provide information about their qualifications. Representatives of relatives had questions about facilitators, barriers, strengths, weaknesses, and networking. The questionnaires were mainly closed-ended and asked about known, available, needed, and used forms and means of AAC. The survey also covered the competencies, qualifications, training measures, and staff cooperation with external experts. Another block of questions addressed the AAC needs, the exchange between life areas about AAC, and the transfer of communication structures when moving to another facility. Finally, we asked about strengths, weaknesses, and possibilities for improvement in AAC within the organizational structures.

### **Procedures**

All 759 adult day centers in Germany were invited to participate in this study.

### ***Data Collection***

The data was collected through an online form.

### ***Data Analyses***

We analyzed the data from the closed questions using descriptive statistics. One researcher clustered the answers to the open and semi-open questions into categories, and another researcher independently assigned the data to these categories, with an inter-rater agreement consistently exceeding 90%.

### ***Reliability***

The open-ended questions of the online survey were categorized independently by two researchers. Interrater agreement was over 95%.

## **3. Results**

### **The individual AAC needs, the provision of AAC, and the staff's satisfaction**

Ninety-one staff members from 50 adult day services provided information about the proportion of persons needing AAC. They reported that of 719 persons in the adult day services, 75% needed AAC, and 45% used AAC, resulting in a coverage rate of 60%. There were no substantial differences between the age groups. Of these 91 staff, 75 provided additional detailed information on 263 persons in need of AAC from 46 adult day services. Of these, 50% did not speak at all, 20% barely spoke with an active vocabulary of fewer than 10 words, 9% spoke

in simple sentences, and 21% had speech that was difficult to understand, significantly limiting communication with others. Regarding language comprehension, 27% understood spoken language without restriction, 55% understood simple verbal instructions, and 18% hardly responded to verbal addresses and seemed not to understand spoken language.

According to those professionals, 9% of the cared-for persons did not speak, hardly reacted to verbal addresses, and had severe intellectual disabilities without recognizable intentionality. It is reasonable to assume that these individuals need non-symbolic communication approaches for beginning communicators, which 83% received. With this, 70% of caregivers were fully or partially satisfied.

Another 13% of the persons cared for hardly speak at all or only in simple sentences, partly difficult to understand, but understand at least simple instructions, and have no motor impairments. For them, unaided forms of communication, such as gestures and signing, were a communication option, which 85% of them used and with which 85% of the caregivers were fully or partially satisfied.

12% had additional motor impairments, suggesting low-tech communication cards, boards or books, or high-tech speech-generating devices come into question for them. 81% used low-tech communication aids, and 36% used high-tech communication aids. 90% of their carers were fully or partially satisfied with this.

7% had unrestricted speech comprehension but severe speech and motor impairments so that they could benefit from dynamic displays AAC systems. Half of them had such a device. The provision satisfied all the caregivers, and the support satisfied two-thirds of the caregivers.

Overall, the provision of augmentative and alternative communication satisfied 76% of the staff members. However, 24% were unsatisfied and gave most frequently as reasons: lack of time/personnel, material resources, and competencies. Of the 24% unsatisfied, 65% had augmentative and alternative communication competencies.

### **Operational AAC structures in adult day services**

#### ***AAC Qualifications of staff in terms of knowledge, skills, and attitudes***

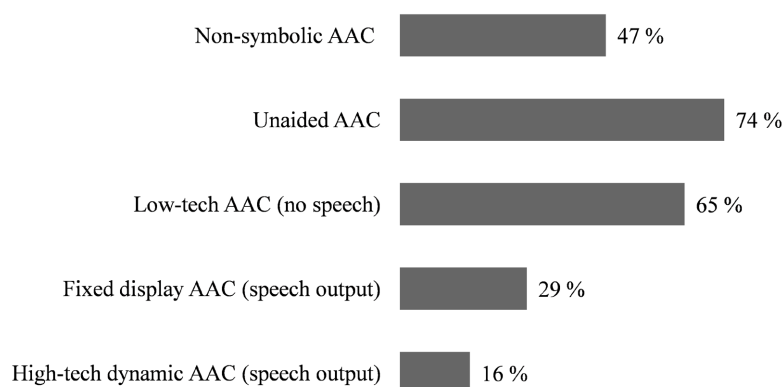
Of the 234 staff members in this study, 51% had a professional training/apprenticeship, 9% had a university degree, 0.4% had no training, and approximately 40% provided no information. AAC competencies and the level of staff training count as indicators of good quality support services. 60% of the staff stated that they have competencies in AAC. 35% have gained these competencies during their training or studies. 41% had attended formal training and further education, and 6% stated that they gained these competencies only informally, e.g. through self-study. Over 90% of staff with a formal AAC qualification also used AAC.

Of the 70 AAC coordinators, 51% had a university degree, 30% had vocational training and 19% did not specify. 24% had long-term training in AAC, 41% acquired their competence in AAC at university/in vocational training, 16% had short training in AAC and 19% did not specify.

Of the staff members, 66% knew non-symbolic communication approaches for

beginning communicators. 94% knew unaided AAC such as gestures or manual signs. 96% knew low-tech communication aids like picture cards, boards, or books. 69% knew about fixed display speech-generating devices, such as talking buttons and boards. 70% were aware of dynamic displays AAC systems. 54% knew contextual visual supports to enhance comprehension. Low-tech communication aids achieved the highest level of awareness, followed by unaided AAC, technical communication aids, pre-intentional communication strategies, and contextual visual supports to enhance comprehension.

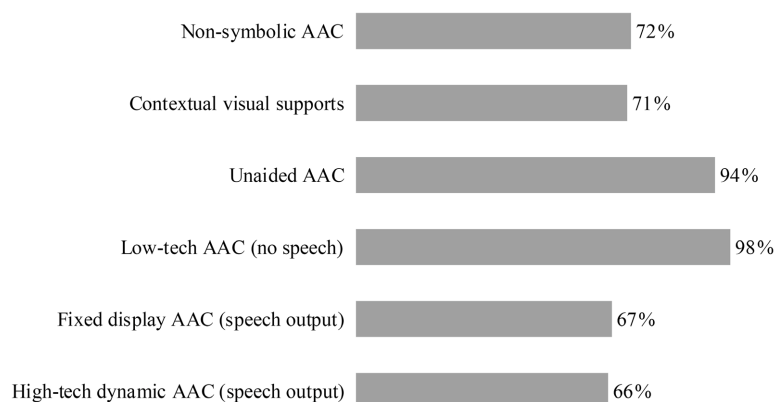
58% of the staff used AAC, 2% did not, and 40% did not provide any information. AAC forms predominant used were unaided forms (74%) and low-tech communication aids (65%)—the same forms of AAC the staff members knew well (see **Figure 1**). The 2% of the AAC staff who did not use AAC gave as reasons that there were currently no clients who needed AAC, that the cognitive skills for using AAC were often lacking, and that there was no AAC standard in the institution.



**Figure 1.** AAC use by the staff ( $N = 263$ ).

### ***AAC Materials and communication aids***

According to the managers of adult day services ( $N = 193$ ), 66% of the adult day services provided all forms of AAC for use or testing, and over 90% provided unaided and low-tech AAC systems (see **Figure 2**).



**Figure 2.** Available AAC forms and aids ( $N = 193$ ).

### *Knowledge management in adult day services*

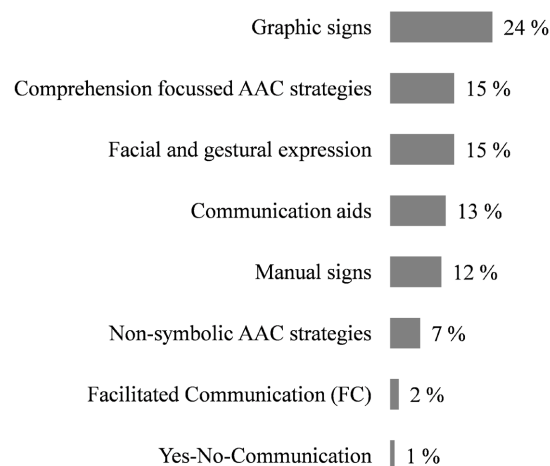
According to the managers of adult day services ( $N = 193$ ), an AAC coordinator existed in 40% of the facilities, in 17% for over five years, in 18% for 2 to 5 years, and in 4% for one year or less (1% provided no information), so they mostly had significant professional experience. The AAC coordinators had between 0.5 and 40 hours per week for this task, with an average of 11 hours. They were responsible for up to 1500 people with AAC needs and had up to 5 hours per person per week, averaging half an hour per week. Cooperation with external AAC centers had 26% of the institutions to an average extent of one hour per week and to their satisfaction. 35% of the adult day services cooperated with aid companies and were all satisfied with the cooperation, with one exception (because of insufficient time for instruction).

61% of the adult day services had an intergroup exchange. The satisfaction rate of the managers was 48%. In the case of dissatisfaction, the reasons given were a lack of personnel/time resources, also against the background of increasing care needs, a lack of systematic and regular exchange, and a lack of coordination.

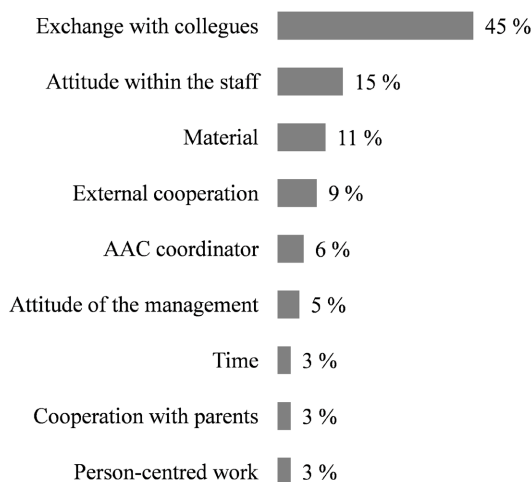
### *Strengths and challenges of the adult day services in using AAC*

45% of the managers ( $N = 193$ ) were positive about the AAC resources in their institution, while 54% considered them insufficient (1% provided no information). 21% reported a lack of technical aids, 14% a lack of personnel and time resources, and 12% each a lack of other materials and financial resources.

78% of the staff participants ( $N = 234$ ) answered the open-ended question, "What works (particularly) well regarding augmentative and alternative communication in your adult day center?" We clustered the free-form answers into categories and subdivided them into areas such as forms of AAC (see **Figure 3**) and organizational strengths (see **Figure 4**). Among the forms of augmentative and alternative communication, graphic signs were most frequently mentioned. Among the organizational and cooperation-related aspects, the exchange with colleagues was the most frequently mentioned, in contrast to person-centered work, cooperation with parents, and time, which staff members hardly mentioned.



**Figure 3.** Forms of AAC mentioned several times.



**Figure 4.** Organizational strengths in using AAC.

The representatives of the relatives ( $N = 12$ ) saw strengths in the processing of information, such as duty rosters or menus, and the motivation of staff members. They saw difficulties in a lack of staff (67%) and time (58%). They saw possibilities for improvement in more time and personnel resources; also, they mentioned an increased involvement of relatives.

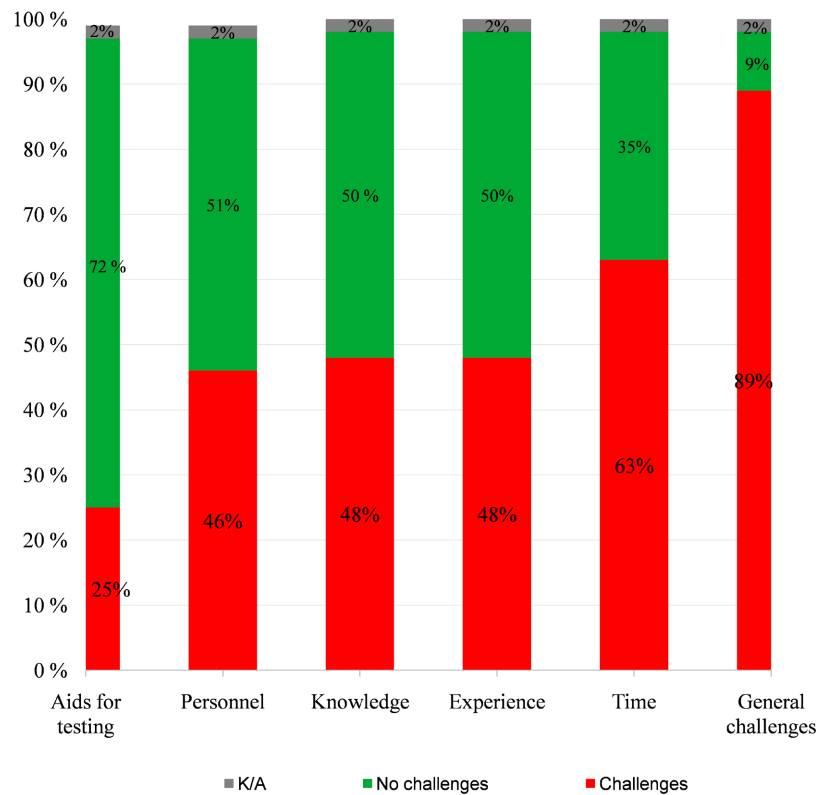
Of the 238 staff members in this study, 89% saw challenges (see **Figure 5**). Most frequently, they mentioned time-related challenges, followed by knowledge, experiences, and personal resources, with about 50% each. Other challenges included factors such as a lack of materials and time resources in the institutions, a lack of interest on the part of the staff, and a lack of acceptance among people with disabilities.

The time challenges show a relationship with the amount of individual support: only 11% of participants who reported time challenges also reported individual support with AAC. Out of all staff participants, 27% reported individual AAC support, which ranged from 10 minutes to 7 hours per week, on average slightly more than one hour (67 minutes). Where satisfaction with the AAC support was indicated ( $n = 144$ ), 43% received one-to-one AAC support, whereas where dissatisfaction was indicated ( $n = 56$ ), 14% received it.

Knowledge challenges were unrelated to AAC competencies: out of the 49% of respondents who reported knowledge challenges, 24% had AAC competencies, and 25% did not.

#### ***Potential for improving the use of AAC in adult day services***

79% of the staff members ( $N = 234$ ) responded to the open-ended question about opportunities for improvement of the use of AAC or mentioned opportunities in the comments. Two researchers independently clustered the responses, with 98% agreement. Areas for improvement were (a) training (65%), (b) more time/staff (31%), (c) AAC materials (16%), and (d) sharing (11%). Other areas for improvement, each mentioned at less than 10%, were the AAC coordinator, internal and external collaboration, colleague and leadership attitudes, and an AAC



**Figure 5.** Challenges from the staff perspective ( $N = 238$ ).

workgroup. The staff members mentioned a standardized use of signs, a consultation room for AAC, a person-centered approach, parental work, applying for aid funding, individual needs assessment, an AAC concept and its anchoring in the facility concept, and quality management. Several positive comments about the study point to the usefulness of study results at the institution and for cross-regional exchange.

In the free comments on the study, participants identified standards in using AAC as desirable, especially in using pictographic signs, even across Germany and Europe. In addition, they suggested an online platform. Participants emphasized the need for individual ways of alternative communication and criticized the supply of technical communication aids. They mentioned that the handling of the communication aids could overwhelm parents. Some pointed out a need for AAC solutions for visually impaired and blind people. Other comments highlight the importance of documentation and contextual visual supports to enhance comprehension (Beukelman & Light, 2020).

#### 4. Discussion

This study complements former research on the need for AAC among adults in facilities for people with disabilities with data on adult day services in Germany and found a need for AAC at 75%. This need is higher than in other institutions for adults with disabilities in Germany, which was between 30% and 70%

(Bienstein & Nußbeck, 2006; Aßmann, 2003; Bosse & Wilkens, 2015) and also above the range between 29% and 68%, found in international studies (Hirdes et al., 1993; Sutherland et al., 2014). A reason might be the high support needs of people in adult day services, which are likely to be lower on average in other facilities.

Former research found the provision of speech pathology services for persons who need AAC between 44% in Australia (Perry et al., 2002; Perry et al., 2004) and 63% in New Zealand (Sutherland et al., 2014). This study adds data from German adult day services, where 60% of persons who need AAC received AAC services. Compared to other studies this level of AAC provision is on the high end, but it still implies that 40% of people who need AAC do not receive it.

In contrast to other studies, the present study differentiated the needs into non-symbolic communication approaches for beginning communicators, unaided AAC, no-tech, low-tech, and high-tech communication aids, and contextual visual supports to enhance comprehension and orientation. This differentiation has proven successful. Another advance of this study is that it examined AAC not only as the provision of aids and therapies, but also as communication in everyday life.

This study surveyed important influencing factors such as the qualification of staff in using AAC, the availability of services as in the studies by Perry et al. (2004), Hirdes et al. (1993), Johnson & Bloomberg (1988), and Bloomberg & Johnson (1990), the internal and cross-facility networking as in the studies by Bosse & Wilkens (2015), Siu et al. (2010) and Perry et al. (2002), and the time, personnel and material resources as in the study by Bosse & Wilkens (2015).

### **Implications**

At the organizational level, training was the most frequently cited opportunity for improvement by employees (65%). Training was also the most frequently cited reason for insufficient resources for managers. The practical implications of this are that AAC training should be provided in adult day services. Additionally, it seems advisable to utilize limited staff resources of adult day services to integrate the use of AAC into group settings. In Germany, communication aids for individuals are financed by the statutory health insurance funds.

Technical communication aids were available in two-thirds of the adult day services. Less than half of the managers and staff considered the materials and communication devices resources sufficient. Given the importance of mediation in the use of communication tools, this shows a need for action in practice. For dynamic displays AAC systems, cooperation with an external AAC center or aid companies can be an option. However, only 26% of the adult day services cooperated with AAC centers and only 35% with aid companies.

Staff and managers mentioned insufficient available personnel/time resources often. However, the staffing ratio in adult day services is significantly higher than in other institutions for people with disabilities, such as residential facilities or workshops. Only 27% received individual AAC support, suggesting the staff members would rather wish for more. Three times as many people with disabili-

ties received individualized support where staff members were satisfied with the AAC than where they were dissatisfied. In case of difficulties regarding time resources, only 11% received individual support. This suggests a lack of group concepts for implementing AAC in adult day services. An AAC coordinator, as was the case in 40% of the facilities, could be useful for implementation if he or she had more than the current half hour per client available. More research on the role, activities and impact of AAC coordinators would be helpful.

## 5. Limitations and Future Directions

The response rate of the present survey was high compared to similar studies in Germany, with data from 234 employees from 103 facilities and 187 facility managers and detailed information on 263 persons in care. Regarding a total number of 33,598 persons in adult day services (BAGüS/con\_sens, 2016) in 2697 facilities in the year of data collection, this study covered only a small proportion of persons with disabilities. In addition, it is reasonable to assume that the proportion of participants interested in AAC was above average.

In this study, communication-relevant skills such as intentionality, language comprehension, symbolic ability and speaking ability were recorded in a more differentiated way than in previous studies. This also made it possible to determine the appropriateness of the care more precisely. However, these abilities were determined according to the assessment of the employees. In addition, this study did not cover reading, writing and foreign language skills.

A fundamental limitation of such studies is that they assess AAC needs, AAC provision, and AAC competencies from the staff's perspective only. There are also fundamental difficulties in deducing needs and provision from data.

On a societal level, there are studies on the need for AAC in the United Kingdom (Creer et al., 2016) and Hong Kong, China (Siu et al., 2010) using an epidemiological research approach. There is no study with this approach in Germany. This study surveyed the AAC situation in adult day services throughout Germany for the first time. In international research, there are also only two nationwide surveys for adults: a survey of institutions and households in Canada (Hirdes et al., 1993) and a survey of speech and language therapists in New Zealand (Sutherland et al., 2005). There is a need for more nationwide surveys to capture the global situation, ideally differentiated by age groups, disability types, and institutions/households.

## 6. Conclusion

This study's results show a comprehensive and highly heterogeneous need for AAC in adult day services. The spectrum ranges from people who do not respond to speech at all to people who can implement simple verbal instructions to people who can use dynamic displays AAC systems. Since communicative expression and interactive exchange represent the basis for any care, support, and service, adult day services need a corresponding wide range of AAC strategies and comprehen-

sive AAC training for professionals.

## Acknowledgement

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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