

# Obstacles to social interaction between people with and without autism in the world of sport

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## 1. Introduction

Autism is a neurodevelopmental condition characterized by significant differences in social communication, interaction, and behavioral flexibility. The relational difficulties that emerge are not exclusively attributable to the characteristics of individuals on the spectrum, but often stem from barriers created by the social, cultural, and organizational context. Stigma, lack of communicative and physical accessibility, and deficiencies in services and professional training are significant obstacles that limit the social participation of individuals with autism.

The proposed analysis aims to explore these aspects on multiple levels, with a specific focus on the Friuli Venezia Giulia Region, a national framework, and a reference to the European panorama.

The overall objective is to identify the main barriers that hinder social interaction and inclusion of people with autism, analyzing them at the regional, national, and European levels. More specifically, the document aims to understand the most common communication and relational difficulties, describe the physical, cultural, organizational, and systemic barriers that impact daily life, and highlight existing social inclusion practices. Comparisons between different territorial levels also allow us to identify common elements and specificities, offering a useful perspective for developing transnational projects.

### 1.1 What is autism?

Autism is a severe disability that causes significant impairments in reciprocal social relationships (see Lorna Wing). This means that people with autism, from childhood, lack the natural ability to communicate, coupled with an inability to learn and recognize the rules of social interaction; the presence of limited and stereotyped interests and behaviors; poor independence and minimal or absent ability to take initiative; difficulties in the functional use of language or even the absence of language; episodes of hetero- or self-aggression; and

difficulty interpreting the intentions of others. People with autism are unable to learn naturally, through the incidental learning process by which all neurologically typical children learn: simply by observing, experimenting, imitating, and categorizing.

The current incidence of autism is estimated at 1 in 150 cases among the child population (official Italian data, B.U.R. Toscana no. 54, 24/12/2008). Newly diagnosed cases of autism (incidence) in the US increased from 15,580 in 1992 to 163,773 in 2003. Unfortunately, the trend continues to rise. More recent data confirm this worrying trend. These data, although with some variations, concern all developed countries. Statistics predict that in the next decade, autism spectrum disorders in general will become a social and economic emergency. Some experts are calling for greater financial resources to be directed toward the treatment of autism.

An autistic person receiving limited treatment is unlikely to be part of the working population in their country. The European Commission has long since stated that autism is the most prevalent of all developmental disabilities. The Italian government has also acknowledged the seriousness of the situation. In 2023, the Italian National Institute of Health published new national guidelines on autism spectrum disorder, which replaced the previous 2011 guidelines. The new recommendations, drafted according to the GRADE methodology and divided into two specific documents for children and adolescents on the one hand, and adults on the other, emphasize the importance of personalized and multidimensional care. The management of autism must take into account the complexity of the clinical picture and include specific interventions, targeted clinical expertise, and rehabilitation and support programs for the individual and their family, built on best practices and founded on the best available scientific evidence.

Without specific training, autistic children and adolescents will be unable to acquire the basic skills needed to perform everyday activities and the knowledge that ensures they can realize their potential.

People with autism may experience a variety of difficulties in social relationships, including:

- Difficulty understanding social cues: People with autism may not understand the nuances

of nonverbal language, such as tone of voice, facial expressions, and gestures, which are essential for communication.

- Direct and literal communication: Many autistic people tend to communicate in a very direct and literal way, which can be perceived as insensitive or inappropriate in complex social contexts.
- Social isolation: Because of these challenges, autistic people may feel marginalized or socially isolated, making it more difficult to build and maintain intimate and meaningful relationships.

Social relationships play a fundamental role in the development and well-being of every individual. For people with autism, the ability to interact socially and build meaningful bonds can be challenging. Autism is a neurodevelopmental disorder characterized by difficulties in communication, social interaction, and repetitive interests and behaviors. In this article, we will explore the topic of social relationships in the context of autism, which is understandable for everyone and useful for promoting greater understanding and inclusion.

People with autism can experience various difficulties with social communication. They often have trouble interpreting facial expressions, vocal tones, and nonverbal cues, making it difficult to understand others' emotional states and respond appropriately. They may have difficulty maintaining eye gaze and interpreting others' communicative intentions. These challenges can make social interactions complex and challenging.

People with this condition may prefer solitude or show reduced interest in interpersonal relationships. Play and social imagination skills may be limited, making it difficult for them to participate in group games or cooperative activities with their peers. These barriers can lead to social isolation and negatively impact the emotional well-being of people with autism.

Social inclusion is essential to promoting a better quality of life for people with autism. Creating inclusive environments, such as schools and workplaces, can help foster social relationships and active participation in society. Educators, healthcare professionals, and family members can play an important role in providing the necessary support to help people

with autism develop social skills and improve their interactions with others.

For the reasons mentioned above, autistic adults are often lonelier than non-autistic adults. Loneliness for both autistic and non-autistic adults was related to social skills and dissatisfaction with social support. However, the study conducted by researchers Dawn Ee, Ye In (Jane) Hwang, BPsych(Hons), Simone Reppermund, PhD, Preeyaporn Srasuebkul, PhD, Julian N. Trollor, MD, Kitty-Rose Foley, PhD, and Samuel R.C. Arnold, PhD, in “Loneliness in Adults on the Autism Spectrum,” highlights how autistic adults differentiate between loneliness and being alone, and therefore caution must be exercised when interpreting our questionnaire data. Autistic adults report many barriers to socialization, such as noisy environments or the culture of alcohol consumption. They highlight that socializing with non-autistic adults is tiring, demanding, or anxiety-provoking. Some have stated that socializing is unnecessary. Others were bullied, which gave them a negative impression of socialization.

Some autistic adults have reported how a quiet environment, sports, or recreational activities can help them socialize with non-autistic people.

Loneliness is associated with negative psychological and physical consequences. However, little is known about the factors that contribute to loneliness in autistic adults and the barriers they encounter in social interaction with non-autistic individuals.

## 1.2 Communication in autism

Communication problems have always been considered a core feature of autism. However, there are substantial and far-reaching differences in the way people with autism communicate.

This reflects not only the inherent variability of the condition, but also the complexity of communication itself, including the words we use, the order in which we use them, eye contact, facial expressions, gestures, and other nonverbal cues.

The level of ability in each of these areas can contribute to the social difficulties of individuals with autism spectrum disorder.

Communication is inherently social: it requires the ability to appropriately share what you feel or want to say, as well as to understand and respond to what others feel or say. In "neurotypical" people, communication disorders may include problems with language, but not with social interaction.

People with autism, however, have particular difficulty communicating in social contexts. Experts use the phrase "social communication" to emphasize this fact. When Leo Kanner wrote his first paper on autism in 1943, his descriptions of the children he observed included many social communication problems. He noted, for example, a lack of eye contact or response to questions and a tendency toward obsessive conversation. Since then, language and communication disabilities have consistently been part of the concept of autism, but not always a separate criterion for diagnosis.

As researchers have learned more about how language develops in people with autism, perspectives have shifted, more than once, on how and whether to view language and social interaction as separate or interrelated issues.

For many decades, attention focused on individuals with severe autism, who might have few words, rarely initiate interactions, and barely respond. Consequently, a diagnosis of autism required a marked impairment in conversational skills.

Recently, however, doctors have begun to recognize that people with autism can have good verbal skills. Initially, these individuals did not appear to have any social communication problems, but the last decade has shown that they are often considered "clumsy" in their communication and make more linguistic errors than their typical peers.

Individuals on the autism spectrum have been shown to be capable of employing a range of verbal and nonverbal skills, including grammar, correct pronoun use, and speaking responses. Differences in some nonverbal aspects of communication, such as facial expressions and speaking tempo, may explain what others perceive as "awkwardness" in people with autism. As with so many autism characteristics, there is tremendous variability from one person to the next. Finally, problems emerge with two aspects of communication: pragmatics and

prosody.

### 1.2.1 What are pragmatics and prosody?

Pragmatics is the appropriate use of language in social situations. Examples include being able to stay on topic and take turns in a conversation, asking appropriate questions, and using a tone of voice appropriate to the setting (e.g., a quieter voice in a classroom versus on a playground). Prosody is the rhythm of speech and encompasses aspects of verbal and nonverbal communication. Transmitted into spoken words and the pauses between them, prosody has multiple functions (e.g., it conveys pragmatic information; a rising tone, for example, indicates a question).

Prosody also communicates emotion: The question “What do you mean?” can be positive, negative, or neutral depending on how it's spoken; prosody is what alerts a listener to the difference.

Problems with prosody can vary, with some individuals speaking in a monotone, while others exaggerate their high and low tones so dramatically that listeners find their speech unnatural. Many autism therapies incorporate explicit training in these skills.

In 2013, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) added a new diagnosis: social communication disorder (SCD). This condition shares many of the common traits among people with autism, such as difficulty responding to others, using gestures, staying on topic, and making and keeping friends. Individuals diagnosed with SCD, however, do not exhibit repetitive behaviors or restricted interests.

Finally, not all researchers agree that SCD should be a separate diagnosis: they argue that there is insufficient evidence that SCD is a valid and reliably distinct condition, separate from autism.

Clinicians are working to improve pragmatics therapy because it is broadly relevant for most people on the spectrum. Some researchers are focusing on identifying more subtle social communication issues that make interactions challenging even for individuals with strong

language and cognitive abilities. New acoustic analyses and motion capture technologies allow for detailed measurement of vocal pitch, among other variables, and the subtle movements that make up facial expressions.

Communication between people with and without autism is a two-way street. Individuals on the spectrum may face communication challenges, but their peers and conversation partners could do more to meet them halfway by accepting their differences in expression. This last point reminds us how crucial it is to rehabilitate, on the one hand, but also to guide those around the person with autism to adopt ways of interacting that bring them closer together, thus reducing the difficulty of interaction.

## 2. Autism and sport

Sports perform several important functions, supporting community and social behaviors, and promoting health and physical and mental well-being, continually strengthening and enhancing its inclusive value. These aspects are extremely important in the life and development of every individual, and are particularly important for people with special needs such as autism, making them a valuable resource. For a person with autism, physical activity represents a significant opportunity for developing functional skills, as it supports the areas most affected by the disorder; in this case, we're talking about communication, social interaction, emotional development, and learning. Through sports, we can redefine what are, by definition, described as deficits or limitations of people with autism, guiding them toward a beneficial and constructive path for their health and well-being. Different types of sports specifically offer significant support and assistance for the various aspects of this disorder, while also helping to enhance their residual abilities. Practicing sports means having the freedom to migrate to a "free zone," that is, the possibility of being projected into a dimension of autonomy where everyone values their own unique qualities and is enriched by the qualities of others.

When implementing a customized sports program for people with autism, several variables

come into play. Here, we highlight the variables most closely related to the characteristics of autism. It's important to note that these variables are interconnected.

## 2.1 Individual or collective?

First, it's important to consider the preference between individual and team sports. Research has shown that while most children tend to prefer individual sports, parents often perceive greater benefits in team sports. However, each approach has advantages and disadvantages. Contrary to popular belief, even individual activities can improve social and communication skills, as demonstrated by programs such as martial arts and dance. For example, karate has been found to reduce communication deficits in autistic children. However, some individual activities may have limitations in certain areas, such as empathy, as highlighted in a review of dance programs by Chen et al. As expected, group training programs tend to have a more pronounced impact on social behavior than individual practices, such as those conducted at home, without compromising the motor benefits of training. Therefore, it appears that engaging in activities with others, whether in team or individual sports, can bring overall benefits. Furthermore, it has been suggested that integrating social sports games, which involve cooperative strategies, with individual physical or sensory training can improve the effectiveness of sports programs in enhancing social skills.

## 2.2 What kind of exercise environment?

The type of environment in which physical activity is practiced, although very important, is rarely studied or considered in the literature. Indeed, some autistic people may be sensitive to certain sensory stimuli, such as loud noises or bright lights. In this regard, indoor activities are recommended. For example, aquatic activities have been suggested to provide a favorable sensory environment. Swimming pools often have a calm and predictable atmosphere, and the buoyancy of water can provide a feeling of weightlessness and freedom of movement. However, although less predictable and controllable, outdoor activities are probably advisable

for autistic people. Previous research has demonstrated the significant effects of outdoor education on the social interactions of children with developmental disabilities. The rationale behind this particular effect is based not only on the environment itself, but also on the nature of the outdoor activities available. Indeed, horseback riding or cycling appear to be excellent tools for improving many aspects of the autistic population, from basic social interactions to motor and cognitive skills. Outdoor activities offer a more relaxed environment than indoor activities. The adventurous side of an outdoor program, in addition to being well tolerated by autistic individuals under specialized care, has been shown to inspire enthusiasm that leads children to communicate more. Finally, intermediate solutions can also be offered for autistic individuals who cannot tolerate the uncertainty of such an experience. For example, golf, less adventurous but still outdoors, offers a very calm and relaxed atmosphere. This is the perfect example of an outdoor environment being much more predictable and peaceful than a crowded gym with a loud echo.

### **2.3 Game-based, technical, or fitness-focused?**

Game-based sports prioritize the game itself, focusing on elements such as scoring and teamwork, while technical training emphasizes motor skills and abilities. Fitness-focused activities aim to improve muscle function and overall fitness through exercises such as strength training. Research has shown that regardless of the type of training, whether game-based or technical, an aquatic regimen produces similar benefits in motor skills. However, technical training may have greater cognitive benefits than fitness-focused training. Interestingly, the type of training does not appear to have a significant impact on overall quality of life aspects, such as sleep or mood, in children with autism, as both aerobic and motor skill exercises have been shown to positively influence these domains equally. Overall, while game-focused activities are often chosen for their playful nature and may not focus exclusively on physical performance, they are still effective in improving motor skills.

Another aspect that can lead to specific improvements in the autistic population, particularly in the cognitive and psychomotor domains, is the distinction between "open" and "closed"

practices. In closed activities (e.g., track and field, gymnastics), participants hone their skills within a stable environment designed for their sport, with the goal of mastering specific skills. For example, golf offers this type of closed practice, providing a controlled training environment that can reassure participants. In contrast, open practices (e.g., team sports) involve high levels of uncertainty regarding the environment or the actions to be performed. Despite concerns about the feasibility of open practices for autistic participants due to their unpredictable nature, research has shown that many open practices are beneficial for this population in various areas, from social to motor skills.

Numerous studies on team sports, such as basketball, soccer, or handball, confirm the effectiveness of open sports. Furthermore, activities with a greater degree of uncertainty, such as ball games, can be particularly beneficial for perceptual-motor skills in autistic individuals. This is also observed in individual activities characterized by high levels of uncertainty, such as boxing or tennis.

## 2.4 What type of partner?

When integrating autistic people into sports practice, different approaches can be adopted in organizing group dynamics within the class. Essentially, four forms are commonly observed: (1) groups composed exclusively of autistic participants, (2) mixed groups of autistic and non-autistic individuals, (3) one-on-one interactions involving a coach and an autistic participant (private lessons), or (4) activities involving family members (parents, caregivers, siblings) in the practice.

However, little research exists comparing the effects of these different types of sports programs. Community sports programs, involving a group of autistic participants, have demonstrated positive effects on autism characteristics, such as social and behavioral functioning and communication. Individual programs (involving a coach and a participant) or even home training have also shown positive effects, but often require additional interventions aimed at developing social skills.

Group activities inherently promote social interaction, although individuals with lower functioning levels may initially need to focus on individual practice. Involving parents and/or siblings can be an effective way to foster interest in sports activities in individuals with autism.

Numerous studies have evaluated the effects of family-based programs involving siblings and/or parents, and all seem to agree on the particularly positive impact they have on various aspects of autism in participants. Family-based sports programs can produce benefits that go beyond social aspects, such as improving sleep quality in autistic children, as demonstrated by shared swimming programs. Furthermore, it has been observed that parents' mental health can benefit from participating in sports activities with their autistic children. It is important to note that, although mixing autistic and non-autistic individuals requires careful evaluation and preparation, it is believed to have very positive effects, including promoting positive attitudes among non-autistic individuals toward their autistic peers.

Finally, as mentioned above, animals can also be excellent training companions. Animal-assisted interventions have demonstrated significant benefits on the cognitive, psychological, and core characteristics of autism. Specifically, horseback riding, in addition to its positive effects on cognitive, motor, and social factors, offers the opportunity to develop relationships with horses and learn how to care for animals and understand their behavior.

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## 2.5 Sport versus conventional interventions

Before discussing the potential implementation of sports programs for individuals with autism and their effects on several autism-related outcomes, we propose comparing the effects of sports programs with other conventional interventions. Recent meta-analyses therefore allow us to put into perspective the effects of Applied Behavior Analysis (ABA) and medications for autism compared to sports-based interventions. These studies have quantified the effects of a specific intervention on clinical symptoms compared to a control or placebo intervention in terms of effect size, i.e., standardized mean differences (SMD) with a 95% confidence interval (CI). ABA is a well-known behavioral method that analyzes how an individual's environment influences their behavior and describes interventions that apply the results of these analyses to modify behavior.

It is based on operant conditioning and aims to assess and modify challenging behaviors (e.g., potty training) as well as promote and generalize more adaptive behaviors, for example, through systematic reinforcement. Pharmacological studies are scarce, but some studies have evaluated the effect of various medications (primarily antipsychotics) on restricted and repetitive behaviors, namely stereotypy. A meta-analysis by Eckes et al. revealed that ABA-based interventions significantly improved adaptive behavior compared to usual care, minimal intervention, or no intervention at all (nine studies with 547 participants, SMD = 0.37, 95% confidence interval (CI) [0.03; 0.70]). Adaptive behavior was primarily measured with the Vineland Adaptive Behavior Scale (VABS) and combines communication skills, social interaction skills, daily living, and motor skills. Intellectual functions (verbal comprehension, reasoning, knowledge, and memory) also showed significant improvement after ABA-based interventions compared to control groups (eight studies with 293 participants, SMD=0.51, 95% CI [0.09, 0.92]).

Regarding language skills and autism characteristics, there is no clear evidence of improvement in children receiving ABA-based treatments compared to children receiving

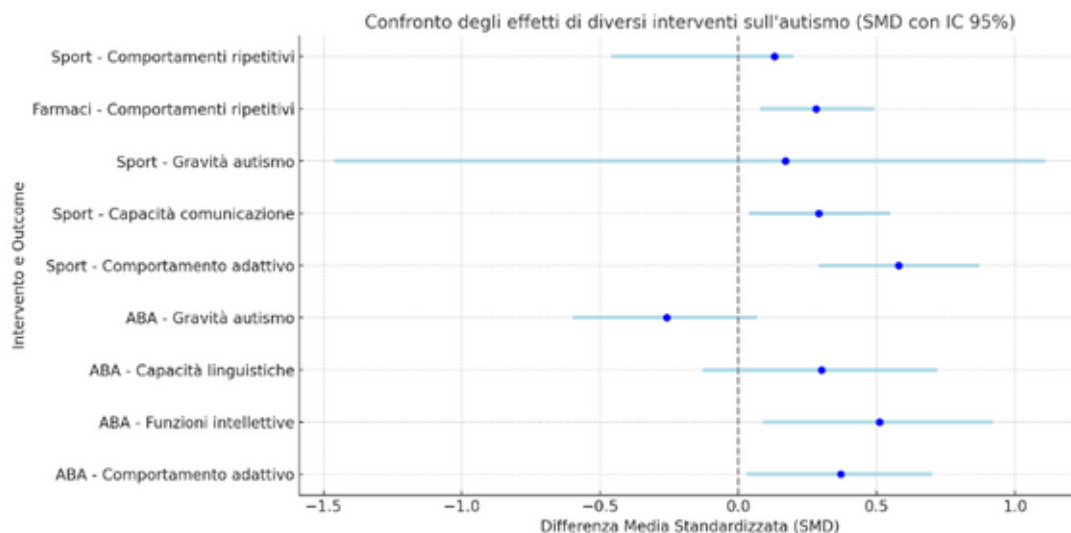
other types of intervention (five studies with 210 participants, SMD=0.30, 95% CI [-0.13, 0.72] for language skills; and three studies with 107 participants SMD=-0.26, 95% CI [-0.60, 0.07] for autism severity, respectively).

Interestingly, these data could be put into perspective by the study by Huang et al., who summarized the effect of sports-based interventions on autism spectrum disorder (ASD). They revealed significant improvements in adaptive behavior, particularly social interaction (three studies with 197 participants, SMD = 0.58, 95% CI [0.29; 0.87]) and communication skills (four studies with 240 participants, SMD = 0.29, 95% CI [0.04; 0.55]). However, they reported no clear evidence of a decrease in the manifestation of autism spectrum disorder (ASD) after sports-based programs (four studies with 172 participants, SMD = 0.17, 95% CI [-1.46; 1.11]).

Regarding restricted and repetitive behaviors in the autistic population, the studies by Zhou et al. and Huang et al. allow for a comparison of the effect of medications and sports activities, respectively. Interestingly, antipsychotics significantly improved outcomes related to restricted and repetitive behaviors compared to placebo (64 studies with 3,499 participants; SMD = 0.28, 95% CI [0.08; 0.49]), while sports-based programs were shown to have only a moderate effect (12 studies with 146 participants; SMD = 0.13, 95% CI [-0.46; 0.20]).

Despite the heterogeneity of experimental designs, these data allow us to understand the magnitude of the effects of different interventions on different characteristics of autism. However, further meta-analyses are still needed to precisely compare the effects of different interventions on autism outcomes, which is beyond the scope of our study.

The following graph compares the effects of different autism interventions in terms of SMD with 95% confidence intervals. The gray vertical line represents no effect (SMD = 0), while the blue dots and bars indicate the effect estimate and the confidence interval for each outcome. For example, it can be seen that sports interventions have moderate effects on adaptive behavior and communication, but a limited impact on repetitive behaviors, while ABA shows more marked effects on adaptive behavior and intellectual functioning.



## 2.6 General recommendations

Traditionally, the World Health Organization (WHO) recommends at least 150 minutes of moderate physical activity or 75 minutes of vigorous physical activity per week. However, determining the ideal amount of physical activity for people with autism remains a challenge, as it can vary depending on factors such as age, ability, and health status. In general, people with autism tend to participate at lower levels than their peers. As discussed previously, they face cognitive, emotional, communication, social, and motor challenges that impact their daily functioning, learning, and recreational activities.

The duration of training can have varying effects on these aspects. Research suggests that longer durations, such as 16 weeks instead of 8, may be necessary to significantly impact school anxiety. In the cognitive domain, changes can occur relatively quickly with specific training focused on this area. For example, active video games, which provide strong cognitive stimulation, can improve cognitive abilities after just 6 sessions. However, motor skills may require longer training durations to show improvement. Furthermore, the

frequency of weekly sessions plays a significant role in the beneficial effects of a sports program.

Studies have shown that increasing the frequency from 1 to 3-5 times per week significantly increases the magnitude of observed changes. A wide range of training durations and organizational strategies have been found in the reviewed literature, but no consensus has been reached on optimal practices.

The mean duration of the protocols was  $12.2 \pm 7.7$  weeks, with an average frequency of  $2.6 \pm 1.4$  sessions per week. The mean session duration was  $56.5 \pm 19.3$  minutes, often below recommended guidelines when considering exercise intensity, which is not consistently reported or quantified. This highlights the need to carefully design exercise programs, considering factors such as duration, frequency, volume, and intensity. Flexibility is crucial given the specificity of the population, which requires adaptation to individual needs and abilities. This may involve modifying activities or providing accommodations, such as additional time or support. It is essential to listen to the individual's needs and preferences and be open to trying different approaches. Many people with autism benefit from structured and predictable environments, clear routines, and expectations. Providing detailed schedules or instructions can help them understand what to expect. It is important to break new skills into small, incremental steps and offer explicit instructions. Simple, gradual feedback using verbal, visual, and manual cues is effective. Positive reinforcement, such as rewards or encouragement, can motivate and support learning and progress. People with autism may experience anxiety, frustration, or other emotional difficulties during sports or physical activities. Discussing their needs and goals with coaches or instructors in advance and establishing clear channels of communication can help address these difficulties. It is essential to consider sensory needs and preferences when choosing activities and, if necessary, provide a sensory-friendly environment. Activities should be enjoyable, appropriate, and safe for the individual, with necessary safety equipment and supervision. Sensory issues should be addressed promptly as soon as they arise.

The reviewed literature highlights the diversity of sports practices analyzed. No specific type

of activity stands out, indicating that a wide range of sports are suitable and well tolerated by autistic people. Whether it is a team or individual sport, involving competition or cooperation, practiced outdoors or indoors, the choice of a sporting activity seems to depend mainly on the preferences of the people involved. Overall, participation in sports showed high levels of acceptance based on satisfactory surveys, which included feedback from both autistic and non-autistic participants, as well as their relatives [80]. These findings support Chan et al.'s conclusion that “given their accessibility, versatility, and effectiveness, physical activity interventions could be considered a cost-effective option for the management of autism spectrum disorders in the future.”

The literature on sport and autism has grown exponentially over the last decade (from fewer than 20 articles published and cited in PubMed in 2013 to 153 in 2023).

However, much information is still lacking. Interestingly, many studies have small sample sizes, some with only two or three participants, indicating the need for larger-scale studies. Furthermore, there may be cultural differences in the implementation of sports programs and the consideration of autism, with variations from Asia (where many studies have been conducted) to Europe. The age range of the population studied in the literature is also broad, but the focus has been predominantly on children.

Specifically, 81% of the reviewed literature tested autistic populations between the ages of 3 and 12, while only 7% focused on adults. Despite representing a larger percentage of the autistic population, males are also overrepresented in the scientific literature. Therefore, there is a need to fill the gaps in the literature on autistic populations. Furthermore, the definition of autism itself can vary from study to study, with autistic individuals sometimes included in a broader range of other neurodevelopmental disorders, such as ADHD (attention-deficit/hyperactivity disorder).

However, few studies have evaluated or compared the effects of sports interventions on different levels of autism severity, as assessed by scales such as the Gilliam Autism Rating Scale or the Childhood Autism Rating Scale (CARS).

Across the literature on sport/physical activity and autism, the percentage of studies using objective and quantitative indicators to evaluate the effects of a given sport program on autistic participants remains low (less than 20% of the literature on sport and autism). Most of the literature includes cross-sectional analyses (comparing groups) or survey analyses, indicating the need for further objective evidence on the long-term effects of sport participation through the implementation of more longitudinal studies involving cohorts of participants.

The progression of outcomes should be compared to a control group or participants participating in another sport program, a practice that is not used consistently (often limited to case studies, single-group studies, small sample sizes, etc.). While most studies focus on a single sport or type of intervention, it is known that autistic individuals can exhibit a variety of responses to sport, and what works for one individual may not work for another.

Studies incorporating different forms of practice have provided valuable insights, revealing specific benefits depending on the nature of the practice. While previous research generally suggests that practicing any sport can lead to an overall improvement in various outcomes, particularly autism-related characteristics, specific effects have been observed.

For example, studies comparing different interventions, such as technical versus play-based approaches, aerobic versus motor exercises, or different types of environments, have identified benefits across all forms of psychosocial skills practice, with some specific effects observed in motor skills and neuromuscular aspects.

Another crucial aspect of the literature on sports and autism concerns the types of outcomes assessed. A wide range of outcomes exists, including autism characteristics and social skills, psychophysiological factors, and neuromuscular components of human performance. However, the wide variety of interventions and populations tested makes it difficult to clearly understand the effects of sports participation on these numerous factors. Few studies are directly comparable, with the most commonly assessed factors being the characteristics of autism themselves, such as social and communication skills, using validated questionnaires and scales. Psychological factors and the well-being of participants and their families are also frequently assessed, and these factors are consistently influenced by sports participation.

However, the literature on the effects of sports participation on motor skills, cognitive factors, neuromuscular plasticity, or physiology in autistic populations remains scarce.

However, there is growing evidence suggesting that these areas should be considered in the same way as psychosocial factors. It is important to emphasize that all factors are interconnected; for example, promoting increased muscle strength in autistic individuals can lead to improved psychomotor function.

Regarding motor skills, it is interesting to note that many studies assess them subjectively using rating scales. A more formal and quantitative assessment should be standardized using functional tests or analytical performance measures (e.g., strength, speed, etc.). From a more fundamental perspective, integrating objective measures of cognitive, cardiovascular, and neuromuscular function into the evaluation of the impact of sports programs should contribute to a better understanding of the motor impairments observed in autistic populations.

In conclusion, the authors unanimously agree on two points:

**(1) sport and physical activity are fundamental components of the quality of life of autistic people and their families, and (2) there is still a significant gap in knowledge on this topic.**

The wide variety of studies, spanning different sports, populations, and outcomes tested, makes it difficult to reach consensus on many aspects. Furthermore, there are crucial practical considerations that require scientific clarification when designing physical activity programs, such as determining optimal training volume (session length, frequency, etc.) and exercise intensity. To address these gaps, it is essential to connect the scientific understanding of autism from a clinical perspective with the principles of exercise physiology. Studies examining sport and autism would benefit from integrating objective indicators of cognitive and motor performance, as well as tools to monitor training load and assess individual responses to exercise. This approach would facilitate the personalization of sports programs, ensuring relevant progression throughout the program to maintain motivation, enjoyment, and seek optimal benefits. Ultimately, the goal is to cultivate a long-term commitment to the

benefits of exercise throughout life, rather than simply focusing on the duration of a specific program.

### 3. Regional Focus - Friuli Venezia Giulia

The number of people affected by Pervasive Developmental Disorders in the Friuli region is increasing as in the rest of Italy (1 case in 150 births).

Unfortunately, in the Friuli Venezia Giulia Region, and in particular in the vast province of Udine (a provincial area of 4,950 km<sup>2</sup> with a population of 541,264 out of a total of 7,845 km<sup>2</sup> of Friuli Venezia Giulia, for a total population of 1,235,270 as of February 28, 2011), there is a clear lack of dedicated services, especially for adolescents and adults. There are no day centers dedicated to adolescents and preadolescents in the entire region. In the province of Udine, there are no independent weekend services for children with autism. The association "Progettoautismo fvg Onlus" has offered its services as a partner at various regional discussions on autism, thanks to its large membership and the positive experiences it has fostered over the years.

The most recent research on autism management clearly highlights how the needs expressed are not only those of the disability experienced firsthand, but also those of the entire family unit, which is committed 24 hours a day to caring for, educating, socializing, and developing the independence of their disabled child.

Parents of a person with autism are often subject to extremely high levels of stress, and to a greater extent than other families, this can compromise family stability. Social isolation is particularly prevalent when educational agencies are unable to promote the integration of individuals with autism, given the serious behavioral issues they often experience. Adolescence and early adulthood are crucial stages in the development of individuals who will then enter an active and socially aware adult life. This is a stage in which social relationships, interaction with peers, and acceptance by a social network become increasingly important. For children with autism spectrum disorder, this age further amplifies their

difficulties. They need to continue and maintain their academic education while simultaneously improving both socialization opportunities and skills related to making choices, taking on responsibilities, and planning for their future.

The future of people with autism depends more on the awareness of parents and professionals, environmental adaptation, and the availability of specialized services than on the severity of the individual's disability. Close collaboration between relevant services, institutions, and families is needed to provide a network of ongoing services throughout the lifespan.

A special education program should begin early in childhood and continue throughout adolescence and adulthood, with the goal of developing and maintaining personal and social skills and increasing autonomy and independence. Adolescents and adults should continue to benefit from individualized educational programs in functional areas such as communication, social skills, work and leisure skills, and personal autonomy. It is also desirable for them to have access to appropriate employment, in a more or less protected environment, with the support of ongoing counseling (job coaching), thus fostering the prospect of an independent, socially recognized adult life. To this end, training programs that facilitate independence and progressive separation from the family are helpful, including through the organization of independent vacations and weekends. The prospect of a dignified future for their child in their own home or in foster institutions also provides parents with the most effective emotional support (cohousing for the future).

### **3.1 Autism project services active in the Friuli Venezia Giulia region**

Mutual aid information desk: aimed at families and teachers, open by appointment in Udine, Gorizia, Trieste, and Pordenone;

**AQUABILE:** A project to promote swimming and independence in the pool at the Tomadini swimming pool in Udine, Aquamarina in Trieste, and the Gymnasium in Pordenone. Packages of 10 lessons are offered with swimming instructors trained and supervised on an individual basis by Progettoautismo fvg onlus (Udine and Trieste) or in collaboration with

already trained instructors (Pordenone). Families are given a booklet and a video modeling CD-ROM to encourage independence in the locker room. The project is implemented in collaboration with the family and the Child Neuropsychiatry Unit of the ASS 4 "Medio Friuli."

**SCHOOL INFORMATION:** an information project aimed at schools in Friuli Venezia Giulia, aimed at both classmates and teachers. It includes an information leaflet for nursery and primary schools, illustrated by the famous Italian illustrator Nicoletta Costa, and an information leaflet for middle and high schools, illustrated in collaboration with the Centro Solidarietà Giovani of Udine.

**SPECIAL NEEDS DAY CENTER**, affiliated with **ASS. 4 "MEDIO FRIULI"** and **CHILD NEUROPSYCHIATRY AT GERVASUTTA IN UDINE:** workshops for protected and adequately supervised meetings, open Monday to Friday from 2:30 pm to 7:00 pm, aimed at children between the ages of 11 and 20 with DGS and related conditions. Programs include programs to help them develop independence, socialize, pre-work activities, and develop the skills necessary for an active and informed adult life. This innovative project, unprecedented in Friuli Venezia Giulia, is carried out at the association's operational headquarters at the Hattiva Cooperative in Feletto Umberto (UD).

The program involves the participation of special needs children with autism and developmental disabilities (PD) and neurotypical children from scout associations and parishes to promote social inclusion in the area and placement in small-scale work at the Ronco Albina social farm in Cividale del Friuli.

**SPECIAL NEEDS SUMMER:** Weeks of recreation and sports for special needs children with pervasive developmental disorders, pre-adolescents and adolescents. These include activities to promote personal and domestic independence, sports, social development activities, road safety education and community independence, and placement in small-scale work at the RONCO ALBINA social farm in Cividale del Friuli. The project was developed in collaboration with the family and the NPIA of ASS 4 "Medio Friuli."

**PARENT TRAINING:** training activities aimed at families of people with autism offered at least annually in both Udine and Trieste and mandatory for families whose children attend the

laboratory activities of Special Needs, Aquabile and Spazio Bimbi.

Recent significant changes in the treatment of autism have been observed throughout Italy, and the idea that it is possible to improve the adaptability of those affected, contributing to the quality of their lives, is increasingly gaining ground. In light of this, since its inception, the Progettoautismo fvg onlus Association has developed a program of intervention for people with autism throughout the region. The large number of participants in the various initiatives proposed by the association is indicative of the high level of satisfaction and, in particular, of the effectiveness of the Parent Training course for parents of children with autism. Its goals are to raise awareness of autism-related issues, improve the quality of life of adults with autism and their families, and provide the skills and techniques needed to interact more effectively with the autistic individual.

**TRAINING FOR OPERATORS, VOLUNTEERS, TEACHERS, AND PARENTS:** training workshops for parents, teachers, volunteers, and operators offered at least twice a year in both Udine and Trieste to promote awareness of autism and its specific aspects, with speakers trained in behavioral techniques.

**Progettoautismo fvg onlus** also specifically trains its volunteers and staff during at least four meetings per year on specific topics and cases brought to the trainer's attention by the staff and volunteers themselves.

**SPECIAL NEEDS INDEPENDENCE WEEKEND:** active from October 2012, it consists of 2 weekends a month of independence and promotion of personal autonomy for pre-adolescents and adolescents in small groups of two - three at the Cjase dai Fruz in Gradiscutta di Varmo in collaboration with the FABIOLA ONLUS association.

This activity is aimed at children with pervasive developmental disorders and is a first for the province of Udine. The project aims to encourage individuals with autism to become independent from their families of origin, thereby establishing a plan for the future. At the same time, it provides parents with relief and respite, allowing them to dedicate their time to their spouse or siblings, often neglected by caring for their disabled child. The project was implemented in collaboration with the family and the NPIA of ASS 4 "Medio Friuli."

**EDUCATIONAL-SPEED AID FOR AUTISM:** Home support and transportation for

individuals with autism and their families. Volunteer support for children and youth with autism and their siblings or family members, provided through specialized training and/or education.

This service is aimed at transporting people to recreational and integrative activities and/or activities promoted by the association or other local bodies, including the experimental day centre and the independent weekends; Promotion of the above activities in the area.

**SPECIAL NEEDS PRIMI PASSI and SPECIAL NEEDS KIDS:** since July 2012, an experimental and innovative project has been designed and developed to provide targeted responses to the needs of newly diagnosed children in preschool and early primary school with Pervasive Developmental Disorders or similar conditions. The proposed intervention focuses specifically on the development of learning, communication, social skills, and independence, through personalized activities designed based on the individual child's individualized plan, in coordination with the family and the NPIA of ASS 4 "Medio Friuli." The team, made up of specialized psychologists and educators, uses a structured approach based on the cognitive-behavioral model, preferably within summer camps for neurotypical children and through one-on-one sessions at the operational headquarters in Feletto Umberto and in the clients' homes.

**SPECIAL NEEDS – THE AQUARIUM OF GAMES: WORKSHOPS FOR BROTHERS AND SISTERS:** special workshops where siblings of a person with autism, along with other sensitive children, can share enjoyable moments together. These workshops provide an opportunity to discuss autism in the family and their unique situation both inside and outside the home. Because autism is difficult to deal with, not just for parents, but also for siblings. Drawing inspiration from Cynthia Lord's book *No Games in the Aquarium*, Progettoautismo fvg onlus embraces the siblings' desire for a normal life. This can sometimes be impossible when an autistic sibling constantly embarrasses you with their "oddities." Perhaps it will be new, very different friends, guided by an expert psychologist, who will help them understand that to be seen for who we truly are, something much more genuine and profound is needed—perhaps precisely acceptance and friendship. Project implemented in collaboration with the Ronco Albina educational farm in Cividale del Friuli.

**SPECIAL NEEDS FRIENDS:** A project for social inclusion and cohesion in solidarity for boys and girls with autism. Participating in social and leisure activities requires a plan with systematic and organized support for individuals with autism. The project aims to gradually build independence and develop appropriate behaviors in various social settings (cinema, pizzeria, sandwich shop, ice cream parlor, arcade, bowling alley, etc.), as well as developing the skills needed to enjoy the activity as fun and share the experience with others.

It offers the opportunity for autistic and PDD children to socialize and be included in a group of neurotypical peers without the support of their families and includes various social activities.

**SHARING FOR AUTISM PROJECT:** A project designed to provide help-care in emergencies such as parental illness, financial hardship, difficulties managing families with children and adolescents with autism, particularly challenging periods for adolescents and young people with autism, and summer periods not covered by regular activities. This service bank aims to share resources between parents and private donors within the association to provide timely educational responses with experienced and qualified staff to address the special needs of children. It involves the association hiring, training, and supervising educators. These educators are made available to families who request them in response to their pressing needs.

Friuli Venezia Giulia has always been active in developing inclusive policies for people with autism, as demonstrated by the recent policy adopted on July 13, 2025, by the Regional Council.

This project, "Public healthcare and local care for people of all ages with autism spectrum disorders," includes two new strategic activities focused on school inclusion and job placement support.

"This measure," explained Regional Health Councilor Riccardo Riccardi, "is part of an increasingly structured and personalized approach to caring for people with autism spectrum disorders and their families, with the goal of developing concrete, effective, and long-term solutions."

The first project, funded with approximately 96,000 euros and implemented by Arcs, involves the activation, at an accredited training institution, of a course to train twenty autonomy and communication assistants, specialized figures who will support schools in drafting and implementing Individualized Educational Plans for the inclusion of students with autism.

"Supporting schools with dedicated expertise," Riccardi emphasized, "means strengthening inclusion from childhood, working collaboratively with families, teachers, and healthcare workers to ensure tailored and truly inclusive educational programs."

The second project, managed by Asugi and funded with approximately €121,000, involves a pilot program of internships and work placements for individuals with autism spectrum disorders. The initiative will also leverage collaboration with third-sector organizations to ensure targeted support for placement in suitable work environments. "We want to offer individuals with autism real opportunities for independence and social inclusion, including through access to the world of work," Riccardi added. "Practicing internships is a crucial step towards enhancing individual skills and overcoming the barriers that often prevent the full recognition of these individuals' potential."

Finally, the councilor reiterated the importance of "a public health system that addresses people's entire lifespan, not only clinically, but also socially and educationally, promoting true integration of services across the community."

#### **4. Regional Focus - Veneto**

In Veneto, there are approximately 4,300 students diagnosed with autism, 963 of whom reside in the province of Treviso. These data confirm the significance of the phenomenon within the province compared to the broader regional context. The province of Treviso, in fact, has a

significant number of individuals with autism spectrum disorders, with approximately 1,150 cases treated by the Child Neuropsychiatry Services of the ULSS 2 (Local Health Authority) and approximately 450 cases treated by adult services.

During the 2024–2025 school year, 1,062 autism diagnoses were recorded among students, distributed as follows: 133 in preschool, 494 in elementary school, 259 in middle school, and 176 in high school. This figure represents an increase over the previous year, indicating greater awareness and improved diagnostic capacity in the area.

Regarding care and support, the Province of Treviso is committed not only to meeting the needs of individuals with autism, but also those of their families, who often experience significant levels of stress. There is growing attention to the need for integrated and continuous services throughout the lifespan, from childhood to adulthood.

Initiatives such as the DAMA project, the involvement of psychologists and educators, and the implementation of specific programs aim to promote social inclusion, personal autonomy, and pathways to employment in protected environments, supported by tools such as job coaching.

Adolescence and early adulthood represent critical periods, during which the need for support in socialization, independence, and planning for the future becomes acute. Independent living opportunities, recreational activities, and supervised vacations are promoted, benefiting both individuals with autism and their families. The cohousing model is also considered an effective solution for ensuring a dignified and sustainable future for individuals with autism, while also offering significant emotional relief to parents.

In summary, the province of Treviso demonstrates a structured and growing commitment to early diagnosis, educational support, and the development of a specialized network of services involving families, institutions, and social and health agencies. The overall goal is to improve the quality of life and independence of individuals with autism and their families.

## 4.1 Autism Services and Projects Active in Veneto and in Particular in the Province of Treviso

In Veneto, and particularly in the Treviso area, numerous autism-related services and projects are active, aimed at meeting the needs of people with Autism Spectrum Disorder (ASD) and their families.

Among the main initiatives is the "Blu Time" project, coordinated by **Autismo Triveneto** with the support of the **ULSS 8 Berica** local health authority. The project includes a series of activities and educational programs for people with autism and their families, aimed at developing skills in various areas of life and ensuring broad and inclusive participation.

The "**Life Project**" is also active in the Treviso area. It aims to develop a multidisciplinary and multidimensional plan for educational, social, and work inclusion, as well as promote targeted interventions to foster autonomy and independence, especially during adolescence and early adulthood. Family support services are also provided, with activities aimed at reducing parental stress and promoting socialization within the entire family unit.

The Province of Treviso, with the support of the Veneto Region, has promoted numerous social inclusion and integration initiatives, such as conferences, workshops, and training projects for educational and healthcare personnel.

Among the most innovative projects are those related to inclusive sports activities, including:

**Sport Life Onlus Montebelluna:** The primary goal is to introduce young people with intellectual, relational, and physical disabilities to the world of sports. Participants can practice their favorite sport—swimming, golf, judo, table tennis, or five-a-side soccer—at both amateur and competitive levels. The association also offers theater, Zumba, and Nordic walking classes, designed to enhance participants' passions and potential.

**Le Abili Bocce:** a social inclusion project supported by a network of local organizations, including Bocciofila Saranese, La Nostra Famiglia of Mareno di Piave, the Community Foundation, and a private sponsor. "Le Abili Bocce" is also the name of the team made up of athletes with disabilities, supported by volunteers and coaches during training at the Santa Lucia di Piave and San Vendemiano bowling alleys. Launched in 2018, the project is now an integral part of La Nostra Famiglia's educational activities.

**Arca Nuoto (Vazzola):** The Arca Nuoto pool offers personalized swimming lessons for people with disabilities, in a protected environment tailored to each individual's needs. The activities promote independence, motor coordination, and psychophysical well-being, as well as providing an important opportunity for socialization.

**Sportler Climbing Center (Silea):** offers paraclimbing, or adapted sport climbing, for people with physical, sensory, or intellectual disabilities. This discipline, in addition to promoting physical and emotional well-being, promotes inclusion and personal growth.

**TMA – Multisystemic Water Therapy (Caputo-Ippolito Method):** A therapeutic approach that uses water as an emotional, sensory, and motor stimulus to promote relationships and social integration. In the province of Treviso, TMA is practiced at the "Rosa Blu" (Monastier di Treviso), "Chiara Giavi" (Montebelluna), and Joy Club (San Vendemiano) swimming pools.

**Recreational Therapy Holidays at Dynamo Camp:** therapeutic holiday experiences for children with serious illnesses and their families, promoting socialization and regaining self-confidence. The first "off-Camp" session was held in Jesolo in 2024, with over 110 participants.

**Hippotherapy at the Villa Margherita Inclusive Park (Treviso):** a project launched in

2021 that offers assisted riding activities for people with disabilities, with qualified staff and trained horses, in a safe and welcoming environment.

In addition to these initiatives, the Treviso area boasts numerous inclusive settings and community projects that promote the social integration of people with autism, enhancing their active participation in school, work, and recreational life.

Concrete examples include:

**6InSuperabile – Includes and Overcomes Abilities:** a project promoted by Brombal (Altivole) together with the Cavanis Alumni Association, the Cavanis Institute of Possagno, and the Polisportiva Terraglio (Venice). It promotes inclusive sporting events and educational activities to spread a culture of inclusion. Since 2024, its management has been entrusted to the Brombal Foundation.

**Baskettosì:** a unified basketball project that unites athletes with and without disabilities, linked to the TVB Academy Treviso Basket, with the goal of fostering team spirit and inclusion through international tournaments.

**Oltre il Labirinto Farm (Vascon di Carbonera):** offers agricultural workshops to develop independence and promote social inclusion, countering isolation.

**Treviso – The Inclusive Province:** an initiative promoted by ULSS 2 Marca Trevigiana in collaboration with local associations and institutions, aimed at building a widespread network of support and social participation for people with autism and their families.

## 5. National focus - Italy

Sport is recognized in Italy (as elsewhere) not only as a physical activity, but as a social context where relationships, autonomy, routine, and a sense of belonging can be built: elements that are particularly useful for many people on the autism spectrum (improved social skills, predictable routines, sensory self-regulation when the activity is adapted). This recognition underpins numerous local and national projects and policies.

The Italian context is characterized by a regulatory framework that, while not specifically dedicated to sport, also impacts this area. The Italian National Institute of Health has developed guidelines on autism spectrum disorders, primarily clinical and rehabilitative in nature, but also includes references to the need for rehabilitative and social contexts, including physical activity and sports. At the ministerial level, protocols have been signed between the Ministry of Education and the Ministry of Health to promote the scholastic and social inclusion of students with autism; these agreements, while not always continuously renewed, have also provided a framework for extracurricular and sporting activities. At the same time, the national sports system, composed of CONI (Italian National Olympic Committee), the Italian Paralympic Committee, federations, and promotion bodies, has begun to include inclusion as an explicit objective in its programs. However, concrete implementation depends on the commitment of local committees and individual federations, with considerable variability across disciplines and regions.

Here are some of the many initiatives active in Italy: Special Olympics Italy: one of the leading national organizations, involving people with intellectual disabilities and autism in sports programs, events, and health programs. Filippide Project: active for over twenty years, it promotes athletics and endurance sports for people on the spectrum, with regional chapters and international collaborations. Local initiatives: experiences such as the Romulea Autistic Football Club in Rome, or the numerous inclusive ASDs affiliated with organizations such as UISP, CSI, and AICS, which create spaces for mixed sports. European and national projects: including INSPIRE and Playinc4kids, which develop tools and training for coaches and

operators. Sports federations: some federations, such as the fencing federation, have developed guidelines for coaches and clubs on the inclusion of people with autism.

Training plays a crucial role. In Italy, several sports promotion organizations, social cooperatives, and associations organize courses for coaches and staff, providing theoretical and practical tools for adapting sports activities to the needs of people on the spectrum. Despite this progress, training is not yet mandatory or standardized at the national level: its quality often depends on the initiative of individual organizations. Shared best practices include the use of visual routines to punctuate activities, structuring sessions into small steps, paying attention to sensory stimuli, and the presence of support figures alongside coaches.

The national landscape remains marked by several critical issues. First, territorial fragmentation: some regions have numerous projects, while others have very limited offerings, risking significant inequalities. Added to this is the lack of specific national sports guidelines on autism: the ISS's clinical recommendations have not yet translated into uniform operational protocols for sport. Coach training, while growing, remains uneven and non-binding. In terms of resources, many projects depend on temporary calls for proposals or donations, without ongoing funding, and bureaucratic obstacles often slow down their implementation. Finally, some initiatives tend to organize activities exclusively for people with disabilities, thus risking reducing opportunities for interaction with non-autistic peers. Despite these limitations, the outcomes observed in Italian projects show significant benefits. Sport contributes to improving the physical fitness, sensory management, and self-esteem of people with autism. Above all, it creates opportunities for socialization and belonging, involving not only athletes but also families, volunteers, and the community. These experiences demonstrate that sports inclusion is possible and generates social value. However, there remains a need to strengthen research and collect systematic data to measure long-term impacts. In summary, the Italian picture of integration between people with and without autism in sports appears promising but uneven. Excellent experiences exist, with established networks and best practices already in place, but their diffusion remains uneven across the country and lacks strong national coordination. The main areas for improvement are the definition of shared operational guidelines, standardization of training, stabilization of

funding, and the development of models that balance dedicated activities with truly inclusive opportunities.

## 6. National Focus - Slovakia

Slovakia's social inclusion framework is managed mainly by the Ministry of Labour, Social Affairs and Family, the Ministry of Education, and local municipalities. Key mechanisms include special education programs, community-based social services, and the deinstitutionalization strategy (2021–2030).

### Regulations and guidelines:

Act No. 448/2008 on Social Services – regulates access to social support for persons with disabilities.

Act No. 245/2008 on Education (School Act) – supports inclusive education, though implementation varies.

National Strategy for the Protection and Promotion of the Rights of Persons with Disabilities (2021–2030) – includes objectives related to autism awareness and inclusion.

Slovakia follows EU and UN standards, including the UN Convention on the Rights of Persons with Disabilities (CRPD).

At the time of Czechoslovakia, the country implemented the Education Act, which implied providing children with Special Educational Needs (SEN) which were necessary for them to ensure their development and inclusivity. Following the UN model of inclusion, the country enrolled children with SEN in ordinary schools but at the same time provided them with additional support out-of-class. After the dissolution of Czechoslovakia, in 2008 Slovakia translated and integrated Convention on the Rights of the Child to the national law thereby preserving the rights of children with SEN to education and adapting it to the needs of the children. Inclusion started to be developed after implementation of Convention on the Rights of Persons with Disabilities (CRPD) and the 2014 Strategy. Also, Slovakia provided a training program for teachers to make them able to work with children with autism. In 2021

However, nowadays the policy towards incursion of people with SEN that is outlined in documents such as the CRPD is not developed properly and in some places even absent.

### **Main stakeholders:**

Public bodies: Ministry of Education; Ministry of Labour, Social Affairs and Family; municipalities.

Schools and universities: inclusive education programs and teacher training institutions.

Associations and NGOs: Spoločnosť na pomoc osobám s autizmom (SPOSA), Autistické centrum Andreas, Nádej pre autizmus, Platforma rodín detí so zdravotným znevýhodnením.

Day centres and social service providers: provide socialization, therapeutic, and work training programs.

Nowadays, Slovakia initiates many projects to support people with autism. For example, the project SPOSA researches the problems which such people and their families are dealing with by organizing many activities for them. The ANDREAS aims to use therapeutic practices to facilitate the life of people with autism, to help them to integrate in schools and at work. “The Magic Kids” which cooperates with American project “Global Autism Project”. This project informs what autism is and what modern medical methods are to facilitate it. Also, within the framework of this project specialized people work with children with autism.

## **6.1 Analysis of the status of inclusion**

### **Current situation:**

Social interaction between individuals with autism and their neurotypical peers in Slovakia remains limited, particularly outside educational environments. Although inclusive education policies have been gradually implemented in schools, the level of genuine peer understanding and acceptance still varies considerably.

The ongoing development of inclusive education has contributed to gradual improvements in relationships between students with autism and their neurotypical classmates. Positive changes are especially visible in educational settings where teachers and assistants actively

support inclusion. However, research and secondary data indicate that several challenges persist. Differences continue to exist in the quality of relationships between neurotypical peers themselves and between students with autism and their classmates.

Some individuals with autism report feelings of fear or uncertainty when communicating with their peers, suggesting that they may experience insecurity or a lack of confidence in social situations. This aligns with findings by Frostad, Pijl, and Flem (2008, as cited in Lőrinczová, 2017), which highlight that integration in schools can sometimes reveal tensions or difficulties in social dynamics within the classroom environment. As a result, while formal inclusion has improved access to education, true social inclusion – characterized by mutual understanding and friendship – remains only partially achieved.

Challenges also extend beyond the educational context. In workplaces, interactions between employees with autism and neurotypical colleagues can occasionally lead to misunderstandings or conflicts, particularly when communication styles and expectations differ. Barriers related to communication, sensory sensitivity, and environmental factors often contribute to exclusion from employment or limited participation in teamwork. To address these issues, it is essential that the state and employers actively respond to the needs of people with autism by creating safe, supportive, and inclusive work environments. Such measures should ensure equality of opportunity while preventing discrimination and promoting the full participation of individuals with autism in professional and social life.

### **Ongoing Initiatives:**

Several initiatives are currently being implemented in Slovakia to promote inclusion and raise awareness of autism. These include:

Autism Awareness Month events, organized by NGOs and advocacy groups to promote public understanding and acceptance.

Inclusive education pilot programs funded by the Ministry of Education, aimed at improving the integration of children with special educational needs into mainstream schools.

Community inclusion projects supported by the EU-funded Operational Programme Human Resources, focusing on social participation and capacity building for organizations working with individuals with autism.

## **Main Non-Governmental Organizations Supporting People with Autism in Slovakia**

Across Slovakia, a diverse network of non-governmental organizations (NGOs) and civic associations plays a crucial role in promoting inclusion, raising awareness, and providing direct support to individuals with autism and their families. These organizations differ in size and focus but collectively contribute to education, advocacy, therapy, and community integration.

In Banská Bystrica, A Centrum focuses on education and training for parents, teachers, and social service professionals in communication and practical work with people with autism and Asperger's syndrome. The organization also promotes human rights and inclusion initiatives.

In Bratislava, several active associations lead national awareness efforts. Spolu AUT develops projects supporting families with autistic children and promotes public understanding. Čmelík provides leisure-time and social inclusion activities for autistic and disabled children and adults. F84 o.z. operates a private primary and nursery school for children with autism, established in 2007/2008. SPOSA – The Society for Help to People with Autism, one of Slovakia's most recognized parent organizations, advocates for the rights and quality of life of children, youth, and adults with autism nationwide. HANS o.z. supports individuals and families affected by Asperger's syndrome and high-functioning autism through therapy, awareness, and family programs in several Slovak cities. RATA o.z. provides applied behaviour analysis (ABA) therapy, developmental screening, sensorimotor training, and inclusive workshops, while also offering professional training for parents and specialists.

Outside the capital, regional organizations provide vital community-based support. In Čierny Balog – Medveďov, Burko o.z. assists people with various disabilities and their families in

navigating financial and social support systems. In Drietoma, AURO – Autism and Family o.z. helps parents of children with autism and other developmental disorders through information sharing and peer support.

In Košice, ArtEst focuses on the artistic education of disadvantaged youth, and Usmej sa na mňa works toward the social integration of children and young people with hearing, visual, mental, and physical disabilities. Nádej pre autistov is an association of parents and friends of people with autism promoting inclusion and social participation. The Institute of the Mother of Perpetual Help (IMUP) advocates for legislative changes to improve care for people with communication disorders, autism, and other marginalized groups.

In Nitra, the Club of Parents of Autistic Children provides guidance and mutual assistance to families. Similarly, the SPOSA branch in Nové Zámky supports children with autism and promotes measures that improve their quality of life.

In Poprad, Nádej Association supports people with mental and combined disabilities, including autism, while in Prievidza, the SPOSA branch offers professional support and works to foster conditions for the social inclusion of autistic individuals.

In Rimavská Sobota, Plamienok nádeje brings together parents and friends of people with disabilities to help families overcome daily challenges in health, social, and community care.

In Spišská Nová Ves, the Association for People with Mental Disabilities focuses on maintaining and improving social services and promoting work therapy and employment skills among clients.

In Trenčín, AUTIS o.z. provides social care, preventive programs, counselling, and organizes exhibitions and training focused on autism awareness. In Trnava, the SPOSA branch supports people with autism, while Na trati o.z. runs a specialized center for autistic children, providing early support for families and enabling parents to return to work.

In Veľké Úľany, KONRÁDKO o.z. assists people with intellectual disabilities and autism, as well as their families and caregivers.

In Žilina, Kvet života – Flower of Life supports physically and mentally disabled children

and their families, while Detská komunita o.z. offers comprehensive care for children and adults with special educational needs, including autism. The SPOSA branch in Žilina-Bánová represents the interests of people with autism and their parents, promoting advocacy and cooperation at the regional level.

Collectively, these organizations demonstrate the vital role of civil society in autism support in Slovakia. They fill important gaps in public services, often providing specialized therapy, advocacy, and family support that state institutions cannot yet deliver consistently. Their activities also help to shape a more inclusive and empathetic social environment for people with autism and their families across the country.

## Existing Barriers

Despite progress, several barriers continue to limit effective inclusion and meaningful social interaction:

**Communication barriers:** limited public understanding of autism spectrum differences and a lack of appropriate communication strategies.

**Cultural barriers:** persistent stigma and misconceptions about autism in society.

**Structural barriers:** inadequate inclusive environments, insufficient accessibility, and a shortage of trained staff.

**Policy barriers:** fragmented coordination among ministries and inconsistent implementation of inclusive policies at local levels.

## Opportunities

At the same time, there are several opportunities to strengthen inclusion in Slovakia:

The growing involvement of NGOs and increasing parental activism in shaping

community-based support services.

Rising public interest in neurodiversity, particularly among young people and in the media.

Continued availability of EU funding for projects promoting inclusion, education, and social integration.

## **Inclusion through Health, Sport, and Well-being**

Physical activity plays a vital role in supporting the health, development, and inclusion of children with autism. According to the World Health Organization, exercise is a structured form of physical activity aimed at improving or maintaining health and fitness, and its benefits extend well beyond physical well-being. Research shows that regular exercise increases energy, improves sleep and immune function, reduces anxiety and depression, and enhances concentration, memory, and learning performance. These findings are supported by the lived experience of a Slovak family who shared how sports activities helped their son regain strength, coordination, and confidence. Through activities such as swimming, cycling, climbing, and skating, the child not only improved his motor and mental abilities but also developed social and emotional resilience. The parents emphasized that while progress required patience and ongoing support, the positive changes in their son's health, happiness, and social engagement were profound. This example illustrates how accessible sports programs and inclusive physical education can serve as powerful tools for the social and cognitive development of children with autism in Slovakia.

## **Niké League Helps: Supporting People with Autism through Football**

In April 2025, the Slovak betting company Niké, in cooperation with the Union of League Clubs, launched another phase of its social responsibility project Niké Liga pomáha (Niké League Helps). In this round, for every throw-in ("autové vhadzovanie") made during league matches, €50 is donated to the civic association SPOSA, which supports individuals with autism and their families. The initiative aims to raise awareness about autism while

emphasizing inclusion through sport. As Ivan Kozák, President of the Union of League Clubs, noted, football has the power to connect people and change lives. SPOSA Chair Mária Helexová highlighted that such initiatives bring visibility to the challenges faced by people with autism – specially adults – and help “bring the ball back into play” for families often left outside the system. With the slogan “Hra nás spája” (“The Game Connects Us”), the project demonstrates how sport can transcend competition to promote empathy, inclusion, and solidarity across society.

### **Inclusion in Sport: Opening Dialogue to Support Athletes with Disabilities**

The international forum “Inklúzia v športe” (Inclusion in Sport), held in Bratislava in 2021, aimed to establish a foundation for dialogue on supporting athletes with disabilities and their organizations. Organized by the Ministry of Education, Science, Research and Sport of the Slovak Republic in cooperation with the National Sports Centre, the event served as a platform for sharing experiences among Slovak and international experts, sports organizations, athletes with disabilities, and their families. Former Minister Branislav Gröhling emphasized that the success of Slovak Paralympians – who won eleven medals at the Tokyo Games – demonstrated that disability is not a barrier to achievement or excellence. The Ministry highlighted that sport is one of the most effective means of inclusion, improving both the physical and mental well-being of people with disabilities. The forum brought together key figures such as the Public Defender of Rights Mária Patakyová, Commissioner for Persons with Disabilities Zuzana Stavrovská, and representatives from the Slovak Paralympic Committee, Special Olympics Slovakia, and Deaflympic Committee of Slovakia, marking an important step toward stronger inclusion in Slovak sport and society.

## **6.2 Methodology**

The primary research tool applied in this mapping activity was a review of secondary sources. This approach involved a systematic analysis of existing national reports, academic

studies, NGO publications, policy documents, and available EU data relevant to the topic of autism and social inclusion in Slovakia.

The review focused on identifying key trends, challenges, and examples of good practice within the Slovak context, as well as comparing them with developments in other European countries. Special attention was given to documents produced by the Ministry of Education, Ministry of Labour, Social Affairs and Family, and by recognized organizations such as SPOSA and the Autistic Centre Andreas, which play a central role in supporting people with autism.

The secondary data analysis allowed for an overview of the current state of inclusion policies, service provision, and social interaction between autistic and non-autistic individuals without the need for direct fieldwork. Although this approach has certain limitations – such as reliance on the availability and accuracy of published information – it provided a solid foundation for understanding national and regional patterns, as well as for identifying areas requiring further empirical investigation.

## 6.3 Results

### Regional differences and comparative findings

The analysis of secondary sources revealed significant regional disparities in the availability and accessibility of support services for people with autism in Slovakia. Most structured programs and international initiatives are concentrated in Bratislava, while other Slovak regions receive substantially less external or institutional support.

An important development outside the capital occurred in 2016, when the University of Prešov launched the Applied Behaviour Analysis (ABA) specialization within its Special Education Program. This initiative provides workshops and training courses for parents of children with autism or other developmental disorders, representing one of the few regional efforts to strengthen professional and family support.

At the policy level, Slovakia – together with Austria, Hungary, and the Czech Republic – has ratified the Convention on the Rights of the Child, committing to promote inclusive education for children with special educational needs (SEN). Austria complemented this with national legislation reinforcing educational inclusivity. Following the dissolution of Czechoslovakia, both Slovakia and the Czech Republic implemented the Education Act, which formally ensured the inclusion of children with SEN in mainstream schools. Hungary, while also endorsing inclusive education, maintained a network of specialized schools equipped to meet complex support needs.

All three countries participated in the Mapping the Implementation of Policy for Inclusive Education project, which monitored the practical realization of inclusive education policies across Central Europe.

In conclusion, the review indicates that the inclusion of people with autism across the lifespan – from childhood to adulthood and old age – remains limited compared to other European countries. There is a clear need for stronger integrational programs and policies to promote social participation and equality. Furthermore, Slovakia should intensify efforts to fully implement the Convention on the Rights of Persons with Disabilities (CRPD) to ensure that individuals with autism can experience genuine inclusion and equal opportunities in all aspects of life.

## 7. European Focus

The inclusion of people with disabilities is one of the principles of the European Pillar of Social Rights, which clearly affirms the right of people with disabilities to services that enable them to participate in society (European Commission, 2018). Personalized support has become a common term in services for people with disabilities. Person-centered planning (PCP) is a recent approach aimed at providing personalized support and improving the

quality of life of people with intellectual disabilities. This approach is considered an effective practice in supporting children and adults with autism spectrum disorders (ASD) to increase social inclusion, independence, choice, and autonomy. However, more needs to be done in person-centered approaches to support children and adults with ASD in terms of participation in the process, as well as the quality of support plans and their implementation. The core features that define autism include significant differences in the developmental areas of (1) social interaction and communication and (2) flexibility of thought and behavior, and may represent lifelong obstacles to aspirations for community living and independent lifestyles.

These difficulties specific to autism can, if not adequately supported, hinder the optimal development and social outcomes of the individual and put him at risk.

Risk of social exclusion. ASD affects a broad spectrum of functions; the condition is lifelong, and as a result, an individual's unique differences are likely to persist into adulthood.

## 7.1 Difficulties in social interaction and communication

The 2019 study by Petrovska, I. V., Giannakopoulou, A. C., Winstanley, A., Miletto, R., Roşca, G. C., Ivanova, B., Kaisa, V., & Trajkovski, V., aimed at analyzing barriers and facilitators to the participation of people with autism spectrum disorders, highlighted that people with ASD have unique support needs, qualitatively different from other special needs, which require specific understanding and approaches to be met (Posada, Garcia Primo, Ferrari, & Martín-Arribas, 2007). The study was conducted in six countries: Bulgaria, Cyprus, Greece, Italy, Macedonia, and Romania, with a sample composed of young people with ASD, parents and family members of children/adolescents with ASD, teachers, and professionals.

During the analysis, it emerged that social interaction and communication problems were considered an important aspect in supporting people with ASD by 68.14% of informants (n=77). Of these informants, 67.53% (n=52) had received an intervention/support and 29.87% (n=23) had not received any intervention/support at the time of the study. The same percentage of informants (68.14%, n=77) identified isolation/loneliness as an important

aspect to consider in supporting people with ASD, of whom 45.45% (n=35) had received intervention/support and 53.25% (n=41) had not received any support (Table A). Thematic analysis of negative aspects again revealed two themes: communication barriers and attitudinal barriers.

**Tabella A. Pratiche negative riguardo alle difficoltà nell'interazione sociale e nella comunicazione**

Tema	Categoria	Frequenza	Esempio
Barriere comunicative	Mancanza di mezzi di comunicazione alternativi	56% (n=55)	"Spingere il bambino a usare solo le parole, senza offrire alternative. Ad esempio, la digitazione. Mio figlio comunica digitando, ha imparato da solo a leggere e scrivere."
	Approccio negativo	17% (n=17)	"Alzare la voce o insistere su un compito a cui non può relazionarsi, e punire per la non conformità."
Barriere attitudinali	Aspettative molto basse o molto alte	27% (n=26)	"[Nelle mie esperienze scolastiche passate] I compiti non erano al mio livello, mi sentivo incapace."

## 7.2 Poor emotional expression

A significant percentage (70.80%, n=80) of respondents stated that emotional expression should be addressed in life planning for people with ASD. Of these, 53.75% (n=43) of people with ASD had received intervention/support and 45.00% (n=36) had received no support to address this issue. Thematic analysis of negative aspects revealed three themes: communication barriers, attitudinal barriers, and systemic barriers (Table B).

### 7.3 Social communication and interaction

Tabella B – Pratiche negative riguardanti la scarsa espressione emotiva

Tema	Categoria	Frequenza	Esempio
Barriere comunicative	Mancanza di comunicazione funzionale	58% (n=57)	"Vengo spesso chiamato a scuola perché insegnanti e personale non capiscono quale sia la causa del suo comportamento problematico... e non riceve l'aiuto di cui ha bisogno."
Barriere attitudinali	Approccio negativo	24% (n=23)	"...Mettere pressione su di lui/lei, urlare, rinforzo negativo per comportarsi in modi inappropriati."
Barriere sistemiche	Mancanza di supporto esperto e risorse	18% (n=18)	"C'è bisogno di supporto nell'area delle emozioni che non è sufficientemente affrontato. Mancano risorse materiali, così come conoscenze su come insegnare queste competenze."

Difficulties with social interaction and communication and the resulting isolation/loneliness are key aspects of supporting individuals with ASD. However, a significant number of individuals in the sample examined (n=23) and (n=41) did not receive support for social interaction/communication difficulties (29.87%) and isolation/loneliness (53.25%).

Thematic analysis of perceived barriers revealed two themes: communication barriers and attitudinal barriers. Attitudinal barriers related to communication and social interaction refer to a negative approach to addressing challenging situations, as well as excessive or insufficient expectations of the person with ASD. These barriers arise from beliefs or misperceptions about a person's abilities, based on assumptions and a lack of direct knowledge. This type of barrier affects accessibility at all levels, as most other barriers are also rooted in attitudes. People with autism are as likely as their typically developing peers to enjoy interacting with others in activities that interest them, even though others often assume otherwise.

Social communication difficulties are a key diagnostic criterion for autism and manifest in a variety of ways. Some people with autism may seek out social opportunities and initiate social interactions on their own;

Many have a sincere desire for friendship, but may find the process of making and

maintaining friendships difficult.

In a recent stakeholder study by Ghanouni et al., limited understanding of social situations was identified as a major barrier to participation for children with ASD. The report includes a telling quote: “He didn't understand, and no one else seemed to understand him” (Ghanouni et al., 2019, p. 1), which describes the social experience of a child with ASD. Specifically, there are two differences in social communication that many people with autism experience, which help explain why social interactions are often challenging: predicting and interpreting the behavior of others, and differences in receptive and expressive communication. People with autism exhibit a delay in developing theory of mind, which can impact their social interactions. Theory of mind refers to the understanding that other people have of thoughts, desires, and needs that differ from one's own. It involves the ability to “put oneself in someone else's shoes.” The individual may have difficulty predicting and interpreting the behavior of others and may also have difficulty understanding the effects of their own behavior on those around them. Individuals with autism often have difficulty recognizing and understanding social cues and therefore do not instinctively learn to adapt their behavior to different social contexts.

Communication problems have always been considered a core feature of ASD. However, there are substantial and far-reaching differences in the way people with ASD communicate.

This reflects not only the inherent variability of the condition, but also the complexity of communication itself, which includes the words we use, the order in which we use them, eye contact, facial expressions, gestures, and other nonverbal cues. They may be slower in developing language, have no language at all, or have significant difficulties understanding or using spoken language.

Some children with ASD develop good language skills, but may still struggle to learn how to use language to communicate with others. They may also communicate primarily to ask for something or complain about something, rather than for social reasons, such as getting to know someone.

They may use some of the following means to communicate with you: gestures, crying,

taking your hand and moving it towards the object they desire, looking at the object they desire, reaching out, using pictures, challenging behaviors, echolalia (repeating other people's words).

According to the stakeholders in this study sample, over half of people with ASD needed support to communicate effectively. This refers to augmentative and alternative communication, which encompasses a wide range of solutions, from the thumbs-up/thumbs-down gesture, to writing or typing one's thoughts, to the use of assistive devices. The lack of effective two-way communication and understanding is detrimental to social interaction and is perceived as a communication barrier by stakeholders.

Supporting alternative means of communication is considered one of the strategies to facilitate participation in transition planning for young people with autism. This is consistent with the study's findings regarding supporting social communication and interaction through effective communication.

Because communication is inherently a two-way process, one aspect of this support may be presenting information in a format usable by people with ASD, supporting their receptive communication skills. Another, equally important aspect may be providing appropriate alternative means of communication and/or understanding a person's expressive communication. A very important consideration in supporting communication and social interaction is providing opportunities for socialization. Stakeholders have identified initiating conversations, building relationships, and establishing peer social skills groups/clubs as some of the ways to facilitate participation for people with ASD.

The study findings are also consistent with previous literature that external supports and services can facilitate social engagement in people with ASD (Ghanouni, et al., 2019).

## 7.4 Emotional abilities

Communication and social interaction deficits in ASD are closely linked to difficulties in understanding emotions, defined as the ability to identify and understand the emotions of others through facial or body signals and within a specific social context.

Research confirms that people with ASD exhibit a general impairment in recognizing emotions from facial and body signals, as well as from voices. These difficulties are hypothesized to arise from impaired attention to faces, specific processing deficits and styles, and abnormal neural circuits that mediate face perception.

Although much less represented in the scientific literature, it appears that people with ASD may also express emotions atypically, which can disrupt two-way social communication. Furthermore, difficulties in regulating emotions can have severe behavioral manifestations in ASD.

Tantrums, uncontrolled outbursts, aggression, and self-harm are often interpreted as provocative or deliberate behavior. While this interpretation may be accurate in some circumstances, more often these inappropriate behavioral reactions stem from ineffective management of emotional states in response to stress or overstimulation.

The need to address emotional skills in support efforts and plans for individuals with ASD was identified by a significant majority (71%) of the sample. Significantly, nearly half (45%) did not receive adequate support. Communication barriers (lack of functional communication) were a recurring theme throughout the study. Attitudinal barriers (negative approach) and systemic barriers (lack of specialized support and resources) were also raised. Stakeholders also mentioned support related to difficulties in reading and understanding others' emotions. Specifically, these include expanding emotional vocabulary, identifying emotions in oneself and others, and responding appropriately to emotions in oneself and others. The findings of the cited research are consistent with previous studies suggesting that interventions/support aimed at understanding emotions are not universally available in schools (Ghanouni et al., 2019) and that teacher support is essential for the implementation of such interventions (Vasilevska-Petrovska, 2015). Teacher support can also, to some extent,

address systemic and attitudinal barriers to the socioemotional development of individuals with ASD. Emotional interventions can lead to broader positive qualitative changes in the sociocommunicative skills and overall development of children with ASD. Therefore, emotional understanding as a crucial construct for social understanding should be an integral part of interventions and educational programs for students with ASD, an area where technology-based interventions have demonstrated great potential (Vasilevska Petrovska, 2015).

The study therefore demonstrates how people with ASD have specific support needs, qualitatively different from other special needs, and how communities lack the knowledge and specific approaches needed to meet these needs. Individualization and personalization of support services are crucial factors in promoting the health, equity, and well-being of people with ASD.

This approach is also considered an effective practice in supporting children and adults with autism spectrum disorders (ASD) to increase social inclusion, independence, choice, and autonomy. Insights from key stakeholders are essential considerations for overcoming barriers to social participation and enhancing decision-making through person-centered support for people with ASD.

## **7.5 Barriers and facilitators to sport participation in Europeans with autism**

Given the increasing prevalence of autism, effective interventions are crucial to improving quality of life. Physical activity has been recognized as a valuable tool for improving physical fitness and reducing autism-related traits, such as repetitive behaviors and social difficulties. However, autistic people tend to be less active than non-autistic people. The SACREE Sport & Autism project, part of the European ERASMUS+ initiative, aims to bridge the gap between standard sports recommendations and the needs of autistic people. This study seeks to provide an overview of sports participation among Europeans with autism and identify the factors that influence their engagement in physical activity.

The method employed consisted of an online questionnaire translated into five languages.

Data were collected from 540 respondents in various European countries. Most responses were provided by parents or caregivers (64.3%), while 25.5% came directly from autistic people.

Since the late 20th century, much research has focused on the potential benefits of physical activity, not only in improving physical function but also in reducing some specific characteristics associated with autism.

Indeed, participating in individual or team sports is associated with a reduction in the severity of autism symptoms, such as stereotyped behaviors or difficulties with communication and social interaction. After three months of regular practice (three 45-minute Tai Chi Chuan sessions per week), a significant decrease of up to 25% in autism composite scores, as measured by the recognized Gilliam Autism Rating Scale 2 Score, can be observed.

This included a decrease in behaviors such as avoiding steady eye contact and bat-like hand movements. However, it appears that autistic individuals are generally less physically active than their non-autistic peers, which may negatively impact various functions, including bimanual coordination. Indeed, as demonstrated in Norouzi's study, inactive autistic children showed reduced mu-rhythm suppression and poorer performance on bimanual coordination tasks compared to their active peers, suggesting that physical activity may play a key role in improving both motor skills and associated neural processes in autism.

This reduced level of physical activity in people with autism may be partly explained by general impairments that affect their daily functioning, as well as by limited accessibility and a lack of awareness of the importance of regular physical activity. Indeed, key factors influencing the effectiveness of interventions include elements such as the type of training and, above all, the dose-response relationship. According to the World Health Organization (WHO), at least 150 minutes of moderate-intensity physical activity or 75 minutes of vigorous-intensity physical activity per week is recommended.

In this context, the study cited is part of an ERASMUS+ project, the SACREE Sport & Autism project, aimed at bridging the gap between mainstream sports recommendations and those with autism.

This initiative has a dual objective: first, to provide a comprehensive overview of the sports practices of Europeans with autism and, second, to identify the determinants that encourage or hinder regular physical activity. This study uses a quantitative approach based on an online questionnaire administered to a diverse population from several EU Member States.

Through this participatory research, which includes the autistic community, it appears crucial to understand the motivations, barriers, and behaviors associated with sports participation in order to design and promote effective and appropriate public policies.

This study has three objectives. First, it examined the frequency and types of sports activities practiced by European citizens, as well as the available infrastructure and resources. Second, it explored the individual and contextual factors that influence sports participation, including age, gender, environment, and motivation. Third, it sought to identify perceived barriers and potential tools to promote greater participation in physical activities and sports.

The chosen method was an online questionnaire, distributed by the project's European partners through their respective regional and national networks in the fields of autism and sport, and translated into five languages: English, French, Italian, Portuguese, and Croatian. Participants were recruited primarily through convenience sampling, based on their accessibility and willingness to participate.

A total of 540 responses were collected from Portugal (n = 86), Italy (n = 173), Croatia (n = 68), France (n = 185), and other European countries (n = 28). 64.3% of the questionnaires were completed by siblings or parents, 25.5% by people with autism, and 10.2% by other caregivers.

The total population was 57.7% male (mean age  $23.0 \pm 13.2$  years), 39.6% female (mean age  $29.0 \pm 15.8$  years), and 3.1% nonbinary (mean age  $27.7 \pm 10.5$  years). The ages of individuals with autism ranged from 3 to 71 years, with an overall mean age of  $25.6 \pm 14.5$  years.

Regarding sports practice, 71.2% of respondents reported regular physical activity, while 28.8% reported no physical activity. Those who practiced sports had an average age of  $26 \pm 14$  years, and were 59% male, 38% female, and 3% non-binary. Non-practitioners had an average age of  $25 \pm 15$  years (50% female, 45% male, 4% non-binary).

Among participants, session frequency ranged from 1 to 7 per week, with a mean of  $2.45 \pm$

1.6. The mean duration of each session was  $65.7 \pm 31.9$  minutes, for a mean weekly total of  $115.22 \pm 154.9$  minutes. No significant differences were observed between men and women ( $P > 0.34$ ). However, a main effect of age on training frequency was observed ( $F_{4,386} = 4.487$ ,  $P = 0.001$ ): older age groups participated in a greater number of sessions than younger ones (e.g., children 3–10 years =  $1.8 \pm 0.9$  sessions/week; adults 41–70 years =  $2.8 \pm 1.8$  sessions/week,  $P = 0.001$ ). Session duration also varied by age ( $F_{4,372} = 3,300$ ,  $P = 0.011$ ), being shorter for children than adults (3–10 years vs. 41–70 years:  $P = 0.006$ ).

The context of their sporting activity was diverse: 56.8% of respondents trained in a sports club, 38.5% practiced freely, 10.8% in a specialized facility, and 4.1% exclusively at school. Thirty-four percent also reported participating in competitive activities, while 66% did not participate in competitive sports. Their motivations for participating varied: 37.8% reported being introduced to sport by their family, 33.1% had started on their own, 12.2% had been influenced by a friend, and 11.5% through school.

The disciplines practiced were heterogeneous, but aquatic activities were the most common (21.7%). Only 21% of sports were team sports (e.g., soccer, basketball), while 79% consisted of individual activities, of which 9% were oppositional sports (e.g., martial arts, tennis). Analyzing the nature of the activities, a prevalence of "closed skill" sports (63%)—i.e., practices in dynamic and variable environments like team sports—was observed compared to "open skill" sports (37%), which are played in stable and predictable contexts such as swimming or athletics.

The social context of the practice revealed further differences: 37.2% trained alone, 34.5% with autistic and non-autistic partners, 21.6% only with family members, and 10.8% exclusively with other autistic people. Regarding motivations, 55.4% stated they practiced because they were passionate about it, 21.6% because they had no alternatives, 19.6% for logistical convenience, and 12.2% because they were influenced by relatives or friends. When asked about accessibility, only 27% believed sport was accessible to autistic people, while 74% responded negatively. Among those who did not practice any sport, 54.1% cited the lack of facilities for autistic people as the main reason, 22.2% said they did not know where they could practice, 6.17% were not interested in sport, 3.4% lacked time, and the others cited various reasons (cost, distance, difficulty). When asked whether sport was

sufficiently accessible to autistic people, 35.5% answered “yes,” while 64.5% answered “no.”



### 7.5.1 Discussion of the results

As part of a European ERASMUS+ project, the SACREE Sport & Autism project aims to provide a comprehensive overview of sports practices among people with autism in Europe and identify the factors that facilitate or hinder regular participation. With over 500 responses collected, the study provides valuable data on the frequency, duration, type, and context of sports practice, as well as the reasons for non-participation.

It is well known that sport plays an essential role in physical and mental health, in line with WHO recommendations aimed at preventing non-communicable diseases such as cardiovascular disease, diabetes, and certain cancers. For people with autism, sport participation improves overall physical fitness, cardiovascular and muscular function, body composition, and metabolism. The results show that the average weekly duration of sport

(115.22 ± 154.9 minutes) approaches, but does not fully meet, the WHO guidelines (150 minutes), highlighting a generally insufficient level of activity.

A significant finding concerns the perception of inaccessibility: three-quarters of participants believe that sport is not adequately accessible, despite a high participation rate. This apparent paradox suggests that those who manage to participate in sport do so thanks to strong personal motivation or the support of adaptive networks and strategies. Conversely, the majority of non-participants cite the lack of adequate facilities as the main obstacle.

The observed sports participation (71.2%) is higher than that reported in previous studies, especially outside Europe, where rates are lower. This could reflect cultural or methodological differences, but also a possible sampling bias, given that participants were recruited primarily through sports-related networks.

In addition to physical improvement, exercise appears to contribute to the positive modulation of autistic characteristics, reducing stereotyped behaviors and improving social skills, emotional regulation, and cognitive function. However, to achieve significant benefits, the "dose" of activity is crucial: previous studies show that increasing frequency and duration leads to more significant effects, for example in reducing anxiety.

The study also highlighted age-related differences: adults participated more frequently and for longer periods than children, probably due to the organization of daily life and not so much to specific characteristics of the autism spectrum.

An important observation emerging from the study concerns the predominance of individual sports over team sports. This finding is consistent with previous literature, which indicates that individual sports can be more accessible to people with autism because they reduce the complexity of social interactions and offer greater control over the context. Among individual sports, aquatic disciplines, particularly swimming, stand out as the most popular, thanks to their predictability, clear structure, and the sensory benefits they offer.

Opposition sports (martial arts, tennis) are practiced less frequently, but they play an interesting role because, while maintaining an individual structure, they introduce dynamics of direct interaction that can stimulate social and regulatory skills. Team sports, on the other hand, are less common, likely due to their greater cognitive and social complexity: they

require coordination, implicit communication, and rapid interpretation of game situations, skills that can be challenging for some individuals on the autism spectrum. However, it is important to emphasize that these disciplines, when practiced in inclusive and well-structured contexts, have a particularly positive impact on the development of social skills.

In terms of the skills required, sports are divided into "closed skills" sports (predictable exercises, stable environments) and "open skills" sports (variable and dynamic environments). The former are predominant, but open skills sports also demonstrate beneficial effects, especially in terms of adaptability and cognitive flexibility. This suggests that a combination of both types could represent an optimal approach to promoting the overall development of individuals with autism.

A key finding from the survey is the difficulty in accessing sports activities. The perception of inaccessibility is shared by both those who practice sports (74% of cases) and those who don't (64.5%). The barriers identified primarily concern the lack of inclusive facilities and dedicated programs, the difficulty in finding suitable environments, costs, and, in some cases, geographic distances.

The lack of accessibility is particularly evident among non-practitioners: more than half (54.1%) attribute their inactivity to this reason. This data highlights that the lack of inclusive opportunities is a greater obstacle than a lack of personal interest or motivation.

Beyond the quantitative aspects, the data collected confirms the importance of sport as a tool for psychological and physical well-being and social inclusion. Regular practice, even in non-competitive forms, contributes to improving quality of life, strengthening self-esteem, reducing stress, and promoting greater community integration. In this sense, sport is not simply a healthy activity, but becomes a true tool for empowerment.

The results of this research highlight how people on the autism spectrum participate in sports more frequently than previous studies have found, but this is still not enough to meet international public health recommendations. The shift toward individual and predictable sports responds to specific needs, but also suggests the need to expand opportunities to include more diverse practices, including appropriately adapted team sports and more complex disciplines.

The main critical issue that emerged concerns accessibility: the widespread perception of a lack of inclusive facilities and specific programs significantly limits the ability to participate in sports, especially for those not already enrolled in dedicated programs. This highlights the urgent need to invest in public policies and association initiatives aimed at developing a truly inclusive sports culture, capable of valorizing diversity and ensuring equal opportunities.

From a scientific perspective, the study confirms the benefits of exercise not only for physical health, but also for the cognitive, emotional, and social development of autistic people. However, to maximize these effects, it is necessary to ensure adequate "dosage" in terms of frequency and duration, promote adapted programs, and raise awareness among the educational and sports communities about the value of inclusion.

Ultimately, the data collected underscores that sport, if made adequately accessible, can be a powerful tool for inclusion, health, and growth for people on the autism spectrum, as well as an enrichment for society as a whole.

## 8. Conclusions

Autism spectrum disorder (ASD) is defined as a neurodevelopmental disorder characterized by difficulties in social communication and restricted and repetitive behaviors, interests, or activities (Görgün & Melekoğlu, 2016). ASD is a neurodevelopmental disorder manifested by the inability and reluctance to establish eye contact with others from childhood, the inability and reluctance to engage in joint attention, and pointing behaviors (İnce, 2017). The most important factors that drive people with autism to participate in sports and physical activities are that these activities generally contain pleasurable elements such as fun, joy, the need for movement, and socialization (Sertkaya et al., 2012). Physical activity can be more simply explained as the movement of the body to expend energy (Güven & Diken, 2014). The generic term for social skills refers to behaviors and thoughts that directly impact individuals' environments, their ability to function in society, and their ability to develop positive human relationships (Samancı, 2017). Today, the most common type of disability

among people with special needs is autism spectrum disorder. Autism is a lifelong neurodevelopmental disorder that first manifests symptoms in the first years of life.

Despite the difficulties illustrated, there are numerous strategies to improve social skills and build authentic relationships:

- **Explicit teaching of social norms:** Many people with autism benefit from direct teaching of social conventions, such as when and how to initiate conversation, how to read nonverbal cues, and how to respond emotionally to others.
- **Psychotherapeutic support:** Applied behavior therapy (ABA) is an effective technique for teaching appropriate social behaviors and improving communication. Additionally, cognitive behavioral therapy (CBT) can help develop skills in managing emotions and regulating behavior.
- **Creating inclusive environments:** It is essential that people with autism have access to social environments where they feel understood and supported. Families, schools, and workplaces must work to create inclusive spaces that foster communication and social interaction.

Families and professionals play a crucial role in supporting people with autism in building social connections.

Family members can help practice social skills in a safe environment, while professionals can offer targeted interventions, such as ABA therapy or psychological therapy, to address relationship difficulties. Collaboration between parents, educators, and therapists is crucial to the success of these interventions.

In terms of social skills, people on the autism spectrum show a greater propensity for sociability than commonly thought. Furthermore, the sociability of autistic people and the neurotypical population is not categorically distinct. Rather, "autistic sociability waxes and wanes in relation to social and interactional conditions. The sociability of nonverbal autistic people, for example, may be obscured by the lack of spoken language, but when they are

allowed to communicate through other modalities [...] their sociability manifests itself."

Available studies show how empirical data analysis frequently tends to confirm subjective intuitions and experiences developed by people on the spectrum and their families. This lends scientific validity to what would otherwise risk remaining individual perceptions without formal recognition. However, the literature highlights the need to give a more central role to the first-person accounts of neurodivergent people. Only through an approach that integrates direct experiences with quantitative data is it possible to more precisely identify the points of contact between different modes of social functioning. Fully leveraging these perspectives is essential to overcoming dichotomous views that tend to view neurodiversity as a deficit, fueling dynamics of inequality and hindering the creation of real opportunities for encounter and inclusion.

Sports and physical activity are very important for people with ASD as they contribute to their mental development and social skills. They have a greater need for sports, as sports and physical activity positively influence people with ASD, helping them behave appropriately in their social environments, establish a place in society, and improve their interpersonal communication (Öztürk, 2012).

Humans depend on socialization and communication. People with ASD exhibit many deficiencies in this regard. In this case, sports and physical activity allow people with ASD to address their disabilities and acquire social skills such as listening, initiating and maintaining conversations, introducing themselves, building self-confidence, honesty, tolerance, cooperation, and more.

The pedagogical and social perception that enhances an individual's psychological and physiological health and regulates their behavior is called sport. In other words, it is a phenomenon that ensures the development of the individual's soul, body, and ideas, and the harmony between them. The human body has a constant need for movement due to its innate characteristics. However, today's technological developments push people into inactivity from childhood, resulting in a lifestyle unsuited to the human organism. This lifestyle causes

organic disorders, which lead to various diseases and increased health problems. The concept of physical activity has become a universally accepted phenomenon and guides our modern lives. Physical activity is an international term used to describe energy-consuming bodily movements. It refers to all bodily movements performed with skeletal muscles and resulting in energy expenditure.

Sport and human life have become inseparable, and its role in keeping people healthy, happy, and motivated throughout their lives is much greater than previously thought. Sport is an important element in preventing people from feeling alone in their lives and acting irresponsibly.

Thanks to sport, many people begin to work together to pursue the same goals. This demonstrates that sport is an important phenomenon in physical, mental, and social development. Sport offers many benefits that positively impact the well-being of all individuals, regardless of age, in the short and long term.

The most important of these are presented below:

1. People who play sports feel fitter thanks to physical exercise.
2. Through exercise, the body improves a person's mental state. Individual or team sports are fun and help reduce stress.
3. Exercise and planned movements build muscle. Muscle requires more energy than fat. For this reason, people who exercise continue to burn calories even at rest.
4. Hunger sensations decrease. People who play sports feel less hungry. Therefore, weight problems are minimized.
5. Playing sports speeds up the digestive system. Calorie burning continues even after exercise. Weight control is easier to achieve with regular and planned physical activity.
6. People who play sports have a stronger immune system.
7. Resistance training helps keep your mind sharp. Exercise improves blood circulation in the brain, which allows you to think better.

8. The quality of sleep in people who play sports improves.

9. Physical activity speeds up the excretory system.

The importance of physical education and sports in preventing emotions such as aggression, anger, and jealousy, caused by society's attitudes and behaviors toward individuals, is too great to be ignored. It is well known that sports play a role in interpersonal socialization, and it can be argued that this role leads to new friendships, and these friendships provide significant support, especially for people with disabilities, in remaining integrated into society.

People with ASD exhibit personality, social, and physical developmental deficiencies compared to others due to their inability to communicate properly. Due to the inability of people with autism to lead a sufficiently active life and the side effects of the medications they currently take, serious problems related to obesity, musculoskeletal issues, and circulatory issues arise in later life. The importance of physical activity and sports in preventing emotions such as aggression, anger, and jealousy, caused by society's attitudes and behaviors toward people with disabilities, is too great to be ignored.

In the scientific study on "The Effect of Motor Training on Social Skills in Autism" conducted by Orhan (2014), it was concluded that the mean scores of individuals who did not participate in sports were higher in all sub-dimensions than those who participated in sports for between 1.5 and 2.5 hours. It was concluded that the means of individuals who participated in sports for less than 1 hour were higher than those who participated in sports for between 1 and 2 hours in advanced language skills, communication maintenance skills, direction giving skills, the cognitive skills sub-dimension, and the total social skills score.

It was concluded that the difference was caused by individuals who did not play sports or who played sports for a relatively shorter time.

Exercise programs and physical activities are of great importance for both individuals with

disabilities and those with TDD. Regular participation in physical activity programs by individuals with special needs is known to increase their self-confidence and enable them to establish much healthier relationships with peers. It has been reported that physical exercise in individuals with autism significantly improves not only the musculoskeletal system but also unusual stereotyped behavioral disorders. In the scientific study entitled "Assessment of Social Skills of Children with Autism Spectrum Disorder in Terms of Participation in Physical Activity and Different Variables" by Termeli (2019), the frequency rates of social skill levels of individuals with ASD in their participation in the BUFA were assessed and examined according to age, gender, and disability diagnosis. In this study, the Wilcoxon test showed that there was a significant difference between the scores of the first and last measurement of individuals who participated; the Wilcoxon test favored the last measurement.

The study shows that participants' total social skills scores increased with a statistically significant difference following participation in the BUFA. Because children with autism are unable to communicate adequately, they exhibit deficits in personality, social, and physical development compared to children with TDD. This situation is minimized by sports and physical activity. Examining the data for the research subscales, a clear difference is noted in the basic social skills of children who participate in physical activity and those who do not. While this difference was observed in basic social skills and self-control skills, no significant difference was found in basic communication skills and teamwork skills. According to the results obtained from the literature as part of our study, when examining studies on the differences between children who participate in physical activity and those who do not, we observe that children who participate in physical activity positively develop social skills and academic acumen. Significant differences were observed in the basic social skills of children with ASD who engaged in physical activity and those who did not. It was concluded that children with ASD who participated in physical activity had better social skills. In this sense, it can be stated that the positive effects of physical activity on children with ASD are quite significant.

Arslan et al. (2019), in their study on the social skills of individuals with ASD, found that

regular physical activity has the potential to positively affect many social skills, such as the ability of children with autism to express themselves, communicate appropriately with their peers, and control their behavior. This finding is consistent with our study. In our literature review, we determined that sports and physical activity reduce behaviors in individuals with autism, such as stereotyped movements and tantrums. When Han (2022) examined behavioral differences in autistic children who participate in sports and those who do not, she found a decrease in aggressive behavioral problems such as spitting, constant swinging, throwing objects, screaming, crying for no reason, harming themselves and others, and tantrums. In a study conducted by Şentürk et al. (2015), it was found that physical exercise improved the basic social behaviors of children with ASD aged 5–6 years and that there were notable differences in the skills and behaviors of children who devoted more time to physical exercise.

Finally, the effect of participation in sports and physical activity on social skills in individuals with ASD has been examined in the literature, and the studies included therein have been analyzed. The results obtained from these analyses demonstrated that participation in sports and physical activity among individuals with ASD as part of a regular program directly and positively influences the development of their social skills. Furthermore, participation in sports and physical activity has been reported to increase attention span, reduce aggressive behavior, improve communication with peers and typically developing individuals, and accelerate adaptation to social environments.

Participation in a regular program of sports and physical activities for people with ASD is important for developing their social skills, but it is even more important to design these programs taking into account individual differences. Furthermore, sports coaches, trainers, experts, and families should be involved in collaboratively planning sports programs and activities for people with ASD. Given the positive impact of sports and physical activity on the social skills of people with ASD, the creation of accessible sports programs should be further encouraged.

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