

Physical Education and Sports of Children with Disabilities and Developmental Difficulties in Serbia: A Review of National Empirical Research (2010–2025)

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ABSTRACT

This paper presents a systematic review of national empirical research on physical education and sport for children with disabilities and developmental difficulties in Serbia. The aim of the study was to examine the thematic orientation, methodological characteristics, and main findings of national empirical studies published between 2010 and 2025. The search encompassed national scientific journals in the fields of pedagogy, special education and rehabilitation, sport, and physical education, as well as the SCIndex Serbia database. Twenty empirical studies were included in the final analysis and systematized into three thematic areas: intervention studies on the effects of physical activity and sport, descriptive-comparative studies on the motor and morphological characteristics of this population, and studies on teachers' attitudes and self-efficacy in the context of inclusive physical education. Findings indicate that structured physical activity programs lead to positive changes in the motor, functional, and psychosocial domains of development; that children with disabilities and developmental difficulties achieve significantly lower scores on motor ability tests compared to typically developing peers, with balance consistently emerging as the most affected domain and that teachers report moderately positive attitudes toward inclusive physical education alongside insufficient specific professional competence for its implementation. The results highlight the need for methodologically stronger research and systematic improvements in teacher professional development in the field of adapted physical education in Serbia.

Keywords: *physical education, inclusive education, physical activity, motor abilities, research review.*

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Introduction

Inclusive education refers to the process by which all students, regardless of their developmental, sensory, intellectual, or physical characteristics, are provided with access to quality education in the local community, together with their peers, while removing barriers that can lead to marginalization and unequal educational opportunities (EASNIE, 2022; UNESCO, 2015). In the context of this paper, the term children with disabilities and developmental difficulties refers to a heterogeneous group that includes children with intellectual disabilities, cerebral palsy, visual and hearing impairments, learning disabilities, and Down syndrome, categories that are represented in the analyzed corpus of national research. Modern approaches to inclusion go beyond formal presence in the education system and emphasize participation, achievement, and a sense of belonging (EASNIE, 2022; UNESCO, 2015).

Within such an approach, physical education and sport are particularly important, as they simultaneously engage the motor, cognitive, social, and emotional aspects of development. International documents emphasize that quality physical education must be based on the principles of equality, protection, and meaningful participation, and that it serves as an important basis for broader social inclusion of children and young people (UNESCO, 2015). Research confirms that physical activity and sport can contribute to the sense of belonging, self-esteem, social relationships, and quality of life of children with disabilities and developmental difficulties (Grandisson et al., 2019; Maksimović et al., 2022; Obradović et al., 2021). However, achieving inclusive physical education in practice remains a complex and insufficiently resolved challenge. Literature reviews show that teachers generally support the idea of inclusion but are cautious about its implementation. The most common barriers cited are insufficient professional training, limited resources, and difficulties in ensuring quality participation of all students in the same learning environment (Karamani et al., 2024; Maksimović et al., 2022; Qi & Ha, 2012). These challenges are not unique to a single national context. In the US, students with disabilities often have similar opportunities to attend physical education classes as their peers. However, schools face significant difficulties in implementing them, especially in teacher training and budget constraints (U.S. Government Accountability Office, 2010). In the European context, research shows that the actual and sustained inclusion of children with special needs in physical education is limited and that there is a gap between the principled acceptance of inclusion and everyday practice in schools (Marron et al., 2023). Broader European reports also indicate significant differences between countries in the definition, monitoring, and statistical presentation of inclusive education, which indicates conceptual and methodological heterogeneity in this area (EASNIE, 2024).

In Serbia, inclusive education has developed gradually, from the dominant model of institutional care and education of children with disabilities in special schools and classes, to the legal establishment of inclusion as an obligation in 2009 (Rojek Zakić et al., 2024). The regulatory framework has since been significantly improved, but

practice still faces numerous challenges in ensuring quality and accessible education for all students (Rojek Zakić et al., 2024). According to data from the Republic Statistical Office for the 2023/2024 school year, approximately 20,000 students with disabilities attend primary schools in Serbia under individual educational plans, while an additional 3,179 are educated in special schools (Republic Statistical Office, 2024).

National literature emphasizes that physical education and sports have significant potential for inclusion, but that their realization largely depends on teachers' attitudes and professional competencies, the availability of space, and the ability to adapt activities (Maksimović et al., 2022). Recent research also confirms the important role of physical activity in the motor development of children with developmental disabilities, which indicates the need for early and systematic inclusion of this population in sports programs (Đurović et al., 2025).

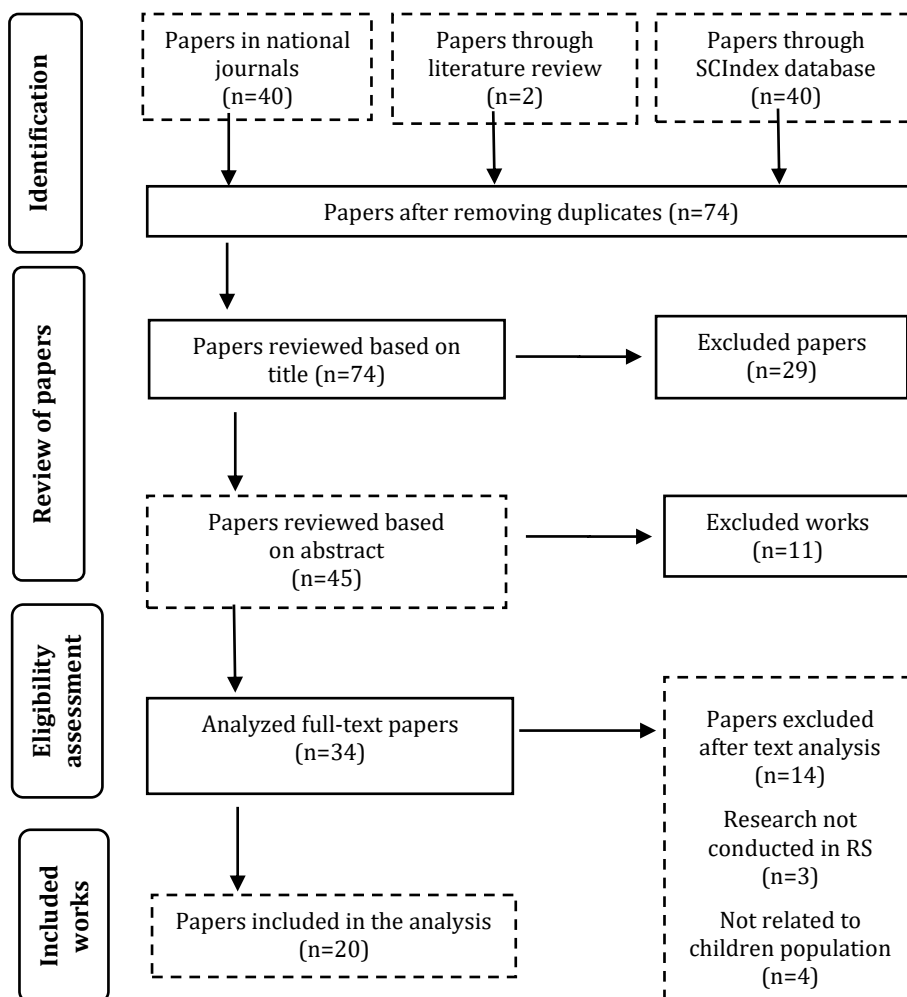
Considering the above, the national literature in the field of physical education and sports for children with disabilities and developmental difficulties extends beyond works that directly address inclusive education, encompassing research on motor development, physical activity, the psychosocial effects of sports, and barriers to participation.

Therefore, to fully understand the scope of national scientific production in this area, it is necessary also to consider works that indirectly shed light on the conditions, assumptions, and effects of this population's participation in physical education and sports. Based on the above, this paper aims to review national empirical research published between 2010 and 2025 to examine the thematic focus, methodological characteristics, and main findings of works on physical education and sports for children with disabilities and developmental difficulties in Serbia.

Methodology

The subject of the review are national empirical research on children with disabilities and developmental difficulties in physical education and sports in Serbia, published between 2010 and 2025. In accordance with the set goal, the procedure was organized through four steps: identification of relevant studies, selection of studies, data collection, and presentation of findings.

The search was conducted by reviewing electronically available issues of national scientific journals in the fields of pedagogy, special education and rehabilitation, sports and physical education, psychology, and sociology. In addition, SCIndex was used for keyword-based searching. Additional verification was performed by reviewing the literature within the identified papers. The selection procedure and the number of papers by phase are shown in Figure 1.

Figure 1*Flowchart of the study search and selection process*

The analysis included empirical works by national authors that thematically belong to the field of physical education and sports of children with disabilities and developmental difficulties. In addition to works directly related to the school and sports context, those that address the physical, motor, functional, and psychosocial aspects of this population's participation in physical education and sports are also included. Review and theoretical works, research conducted outside Serbia, works that do not relate to children, as well as those that are not in accordance with the subject of the

research, are excluded. A team of several researchers carried out the selection—each work was independently reviewed by at least two. In the event of disagreement, the decision was made by consensus, based on pre-established criteria.

The quality of the included studies was not formally assessed as a condition for inclusion in the analysis. The methodological characteristics and limitations of the studies were discussed. The findings are presented in text and tables, organized into three thematic units that reflect the main research directions in the analyzed corpus.

Results and discussion

In accordance with the selection criteria, 20 empirical papers published in national scientific journals between 2010 and 2025 were included in the final analysis. The analyzed papers were systematized into three thematic units: (1) intervention studies on the effects of physical activity and sports on children with disabilities and developmental difficulties, (2) descriptive-comparative studies on the motor and morphological characteristics of this population, and (3) studies on the attitudes and self-efficacy of teachers in the context of inclusive physical education.

The first thematic unit consists of seven intervention studies that examined the effects of structured physical activity and sports programs on various aspects of the development of children with disabilities and developmental difficulties in Serbia. Characteristics of the analyzed studies, including the samples, instruments used, procedures, and key findings, are presented in Table 1.

All studies used a pre-post design, with most being pilot studies with small sample sizes ranging from 7 to 60 subjects. Only three studies included a control group (Pejčić et al., 2019; Perić & Miličević Marinković, 2021; Radenković et al., 2014), and none used a random assignment procedure. The program ranged from 4 to 16 weeks, with 2 to 4 training sessions per week and individual units lasting 30 to 60 minutes.

The lack of randomization combined with small sample sizes represents a significant methodological limitation that reduces the possibility of causal inference and makes it difficult to generalize the findings (Qi & Ha, 2012).

Table 1

Research on physical activity, physical education, and sports of children with special needs

Author(s) / Design / Thematic Area	Age / N	Instruments / procedure	Key results ↑↓
Jorgić et al. (2012) Experimental pilot study; gross motor functions	7 children with spastic cerebral palsy, 7–11 years old	GMFM-88, WOTA2; Halliwick water program, 6 weeks, 2× per week, 45 minutes	gross motor functions ↑; adaptation in water ↑; progress in swimming skills ↑; no significant changes in basic gross motor functions →

Author(s) / Design / Thematic Area	Age / N	Instruments / procedure	Key results ↑↓
Stanišić et al. (2012) Experimental pilot study: physical fitness	12 adolescents with mild intellectual disability, 15.1±1.5 years old	anthropometric measurements, six-minute walk test, and heart rate monitoring; adapted basketball training with gradual introduction of technical elements and game, 8 weeks, 4× per week, about 30 minutes	greater distance on the walk test ↑; lower heart rate after exercise ↓;
Jorgić et al. (2014) Quasi-experimental research: range of motion and flexibility	15 children with cerebral palsy (GMFCS I–III), 6–17 years old	goniometric assessment of shoulder, hip, and ankle mobility; program in water and on land, 12 weeks, 3× per week, 60 minutes	improvement in shoulder flexion and abduction ↑;
Radenković et al. (2014) Quasi-experimental research; motor skills	adolescents with mild intellectual disability, 16–19 years; EG=13, CG=14	motor test battery; EG – adapted basketball program, CG – regular program; 4 weeks, 2× per week	improvement in speed of alternative hand movements ↑; improvement in precision ↑;
Stojanović et al. (2018) Experimental pilot study; balance	15 subjects with mild intellectual disability, 15–20 years old	BOT-2 – balance tasks; ball games and basketball court drills, 12 weeks, 2× per week, 45 minutes	overall balance ↑; dynamic and static balance in multiple tasks ↑;
Pejčić et al. (2019) Quasi-experimental research: physical fitness	adolescents with mild intellectual disability, 13–17 years; EG=30, CG=30	Eurofit battery; EG – football and basketball with technical elements, CG – regular program; 12 weeks, 4× per week, 30 minutes	improvement in arm strength ↑; improvement in trunk muscular endurance ↑; improvement in flexibility and speed ↑;
Perić & Miličević Marinković (2021) Experimental pilot research: psychosocial behavior	adolescents with Down syndrome, 15–17 years old; EG=11, CG=9	psychosocial behavior observation list; EG – adapted football, CG – usual daily routine; 16 weeks, 2× per week, 60 minutes	reduction of aggressiveness ↓; reduction of attention problems ↓; anxiety-depressive manifestations ↓; reduction of social problems ↓;

Legend. EG = experimental group; CG = control group; GMFCS = gross motor function classification system; GMFM-88 = gross motor function measure; WOTA2 = aquatic orientation test; BOT-2 = Bruininks-Ozerecki motor proficiency test; ↑ = statistically significant improvement; ↓ = statistically significant decrease.

The analyzed studies are thematically focused on three areas: motor functions and range of motion in children with cerebral palsy (Jorgić et al., 2012; Jorgić et al., 2014), physical fitness, motor skills, and balance in children with mild intellectual disability (Pejčić et al., 2019; Radenković et al., 2014; Stanišić et al., 2012; Stojanović et al., 2018), and psychosocial behavior in children with Down syndrome (Perić & Milićević Marinković, 2021).

What is common to all the studies analyzed is that structured physical activity programs lead to statistically significant improvements in measured outcomes, regardless of the type of disability, the activity used, or the program duration. Studies with children with cerebral palsy have reported improvements in gross motor function, shoulder joint range of motion, and psychological adaptation in water (Jorgić et al., 2012; Jorgić et al., 2014). Studies focused on children with mild intellectual disabilities have shown improvements in aerobic endurance, speed, strength, flexibility, and balance (Pejčić et al., 2019; Radenković et al., 2014; Stanišić et al., 2012; Stojanović et al., 2018).

A study with children with Down syndrome shows significant improvements in all measured dimensions of psychosocial behavior, including reductions in aggression, attention problems, and anxiety (Perić & Milićević Marinković, 2021). It is worth noting that studies with longer intervention durations (12–16 weeks) report a broader range of significant findings than those with shorter durations (4–8 weeks). However, direct comparisons are not possible due to differences in populations and outcomes. This is consistent with the literature's recommendations on the importance of the duration and frequency of physical activity as determinants of its effectiveness for children with developmental disabilities (Grandisson et al., 2019).

The findings of national intervention studies are consistent with the findings of review studies from the international literature, which confirm that regular participation of children with developmental disabilities in structured physical activity programs leads to positive changes in the motor, functional, and psychosocial areas of development (Grandisson et al., 2019; Maksimović et al., 2022). At the same time, the body of literature in Serbia is characterized by a limited number of studies, narrower population coverage, and predominantly pilot designs, without long-term monitoring of effects.

Motor and morphological characteristics of children with developmental disabilities

The second thematic unit consists of nine descriptive-comparative studies that, without the use of interventions, examined the motor and morphological characteristics of children with different types of disabilities compared with their typically developing peers. The characteristics of the analyzed studies are shown in Table 2.

All studies in this group used a single measurement without intervention, with most including a control group of typically developing peers. Sample sizes ranged from 31 to 88 subjects. Three studies were assessed as methodologically lower in quality

(Adamović & Stošljević, 2013; Protić-Gava & Uskoković, 2016; Stošljević et al., 2011) due to limitations in controlling extraneous variables, ensuring group homogeneity, and ensuring the precision of the applied methodology. The study by Arsić et al. (2016) stands out methodologically from the others because it is based on the analysis of archival competition data, rather than direct measurement, which limits the comparability of findings with other studies in this group. The study by Sadri et al. (2016) also differs in its research subject because it includes typically developing children classified into three groups according to their intelligence level, rather than children with diagnosed developmental disabilities, and was therefore included in the analysis as a study that indirectly sheds light on the relationship between motor skills and cognitive functioning. The analyzed studies are thematically focused on three areas: motor abilities and morphological characteristics of children with visual impairments (Grbović & Jorgić, 2017; Romanov et al., 2017; Zečević et al., 2023), motor abilities and balance of children with intellectual disabilities (Adamović & Stošljević, 2013; Protić-Gava & Uskoković, 2016; Sretenović et al., 2018), and motor performance of children with learning disabilities and hearing impairments (Arsić et al., 2016; Stošljević et al., 2011).

A common pattern across all the studies analyzed is that children with disabilities and developmental difficulties perform significantly worse on motor skills tests compared to typically developing peers. This pattern has been confirmed for children with mild intellectual disability (Adamović & Stošljević, 2013; Protić-Gava & Uskoković, 2016), moderate intellectual disability (Sretenović et al., 2018), visual impairment (Grbović & Jorgić, 2017; Romanov et al., 2017; Zečević et al., 2023), and learning disabilities (Stošljević et al., 2011).

Table 2

Research on motor and functional aspects relevant to physical education and sports

Author(s) / Design / Thematic area	Age / N	Instruments / Procedure	Key results ↑↓
Stošljević & Amović (2011) descriptive-comparative; motor performance of upper limbs	learning disabilities, 7–11 years; EG=34, CG=34	somatopedic tests of upper limb motor skills: one-time comparative measurement without intervention	EG weaker than CG on all right and left hand tests ↓; motor performance associated with learning disabilities
Adamović & Stošljević (2013) descriptive-comparative; postural balance	mild intellectual disability, 16–18 years; EG=32, CG=32	dynamic and static balance tests; one-time measurement without intervention	EG slower and less stable than CG ↓;
Protić-Gava & Uskoković (2016) descriptive-comparative; motor skills	mild intellectual disability, about 16 years old; EG=45, CG=48	motor test battery; one-time comparative measurement without intervention	EG weaker in speed, flexibility, balance, explosive and repetitive strength ↓;

Author(s) / Design / Thematic area	Age / N	Instruments / Procedure	Key results ↑↓
Sadri et al. (2016) descriptive-comparative; motor skills and intelligence	typically developing children of varying intelligence levels, 7 years old; N=88	motor tests and Raven's matrices; one-time measurement without intervention	better tapping and flexibility in higher intellectual status groups ↑
Arsić et al. (2016) descriptive: sports results/motor skills	hearing impairment, up to 15 years; N by age of competition	Analysis of archival results of the Republic Games of Deaf Students of Serbia (2005–2015)	score during the observed period ↑;
Romanov et al. (2017) descriptive-comparative; morphology and motor skills	visual impairment, 12.97±2.03 years; N=31	anthropometry and motor tests; one-time measurement without intervention	visually impaired better than blind in balance ↑;
Grbović & Jorgić (2017) descriptive-comparative; motor skills	visual impairment, 7–12 years; N=51	Eurofit battery: one-time comparative measurement without intervention	children without visual impairment in balance, speed, flexibility, core endurance, and cardiorespiratory endurance ↑;
Sretenović et al. (2018) descriptive-comparative; balance	moderate intellectual disability, about 7.6–7.8 years; N=38 boys	BOT-2 balance subtest; single comparative measurement without intervention	typically developing children are significantly better in overall balance and most tasks ↑; children with moderate intellectual disabilities are below age norms ↓
Zečević et al. (2023) descriptive-comparative; motor skills	blindness, 11–17 years; N=44	BOT-2 short form; one-time individual testing without intervention	blind subjects in overall motor score, coordination, balance and upper limb coordination ↓; most blind subjects below average ↓

Legend. EG = experimental group; CG = control group; BOT-2 = Bruininks-Ozerecki Motor Proficiency Test; ↑ = statistically significant improvement/higher score; ↓ = statistically significant lower score.

Balance has consistently been identified as the motor ability in which differences between children with disabilities and typically developing peers are most pronounced, regardless of the type of disability. This has been observed in children with intellectual disabilities (Adamović & Stošljević, 2013; Sretenović et al., 2018) and in children with visual impairment (Grbović & Jorgić, 2017; Romanov et al., 2017; Zečević et al., 2023).

The finding is theoretically expected and consistent with the assumptions about the roles of visual perception and cognitive functions in maintaining postural stability (Bouchard & Tetreault, 2000). The finding of Zečević et al. (2023) is particularly illustrative. (2023) that 86.4% of blind children could not stand on the beam for even a second, and that 95.5% of blind respondents achieved results below the average for their age group, while 100% of peers without visual impairment achieved results at or above the average. Further, the findings of Sretenović et al. (2018) indicate that the motor age of children with moderate intellectual disability is below the age of 4, suggesting significant developmental delay and the need for early and systematic motor support.

In contrast to balance, strength tasks show less pronounced differences compared to the typical population, especially in children with visual impairment (Grbović & Jorgić, 2017; Romanov et al., 2017). This pattern is also consistent with theoretical assumptions, as strength exercises require less visual feedback compared to balance and coordination exercises.

Interestingly, Grbović & Jorgić (2017) found that children with more severe visual impairment performed better on a static balance test than children with moderate impairment. The authors interpret this finding as a compensatory reliance on peripheral vision, suggesting that the degree of impairment does not, in itself, determine the linear level of motor skills and that adaptive mechanisms play an important role in the functional motor development of this population.

The study by Arsić et al. (2016), based on an analysis of archival competitive results for deaf students, shows a positive trend in long jump performance over a 10-year follow-up period. However, results remain below those of hearing peers. This finding indirectly indicates the effects of systematic competitive sports participation on the motor skills of children with hearing impairment; however, without a control group and direct measurement, it is not possible to draw firm conclusions.

The findings of national descriptive-comparative studies are consistent with findings from the international literature, which consistently confirm that children with developmental disabilities lag behind their typically developing peers in most domains of motor skills, with the lag being most pronounced in balance and coordination (Grandisson et al., 2019; Maksimović et al., 2022). At the same time, the national corpus shows several characteristic limitations. First, three studies were assessed as methodologically of lower quality, which reduces the reliability of their findings. Second, none of the studies controlled for variables such as physical activity level, socioeconomic status, or previous experience with structured physical activity, which can significantly affect motor outcomes. Third, the coverage of populations is uneven, with visual impairment and mild intellectual disability being relatively well covered, while autism, multiple disabilities, and other categories are completely omitted from national journals. Future research should focus on broader population coverage, methodologically more robust designs that control for relevant variables, and longitudinal approaches that allow monitoring of the developmental trajectories of motor skills in children with developmental disabilities (Maksimović et al., 2022; Qi & Ha, 2012).

Attitudes and self-efficacy of teachers in the context of inclusive physical education

The third thematic unit comprises four studies examining teachers' attitudes and self-efficacy in inclusive physical education. The characteristics and findings of these studies are presented in Table 3.

All of the four studies are based on self-report questionnaires, with three using a descriptive-comparative design (Đorđić et al., 2014; Jorgić et al., 2023; Protić-Gava et al., 2018) and one using a descriptive-correlation design with regression analysis (Orlić et al., 2016). Three studies use the ATIPE scale as a measurement instrument (Đorđić et al., 2014; Orlić et al., 2016; Protić-Gava et al., 2018), thereby allowing a certain degree of comparability of findings across studies.

The study of Jorgić et al. (2023) used the Serbian version of the Situational-Specific Self-Efficacy Questionnaire for the Inclusion of Students with Disabilities in Physical Education, which represents a methodological advance in measuring self-efficacy in a specific teaching context. The sample sizes ranged from 38 to 221 respondents. A common limitation across studies is reliance solely on self-assessment, without verification of expressed attitudes and beliefs through direct observation of teaching practice, a known limitation of research in this area (Qi & Ha, 2012).

Table 3

Research on inclusive physical education, attitudes, and competencies of teachers

Author(s)/Design/ Thematic area	Age/ N	Instruments / Procedure	Key results ↑↓
Đorđić et al. (2014) descriptive-comparative	teachers' attitudes towards inclusive physical education; 84 teachers from rural and urban schools in the West Bačka district	ATIPE scale and questionnaire on socio-professional characteristics; comparative analysis of attitudes	individual differences on some items in favor of rural teachers ↑; absence of professional training ↓
Orlić et al. (2016) descriptive-correlational	predictors of students' attitudes towards inclusive physical education; 221 final year students of the faculties of sport and physical education in Belgrade, Niš, and Novi Sad	ATIPE, HEXACO, and the competency and experience questionnaire; regression analysis	self-assessment of professional competence and openness to experience associated with more positive attitudes ↑; male students express more positive attitudes ↑;

Author(s)/Design/ Thematic area	Age/ N	Instruments / Procedure	Key results ↑↓
Protić-Gava et al. (2018) descriptive- comparative	attitudes and professional readiness of teachers towards inclusive physical education; 132 teachers from five districts of Serbia	ATIPE and the questionnaire on experience, support, and training needs; comparative analysis	teachers and experience in working with students with disabilities ↑; need for additional professional development ↑
Jorgić et al. (2023) descriptive pilot study	teacher self- efficacy in implementing inclusion in physical education: 38 physical education teachers from primary schools in Niš	Situation-specific self-efficacy questionnaire for the inclusion of students with disabilities in physical education: descriptive and comparative analysis	

Legend. **ATIPE** = Attitudes Toward Teaching Inclusive Physical Education; **HEXACO** = personality questionnaire; ↑ = positive finding/higher result; ↓ = negative finding/lower result;

The analyzed studies are thematically focused on two areas: upper and lower primary school teachers' attitudes towards inclusive physical education (Đorđić et al., 2014; Protić-Gava et al., 2018) and predictors of those attitudes, i.e., self-efficacy for the implementation of inclusion (Jorgić et al., 2023; Orlić et al., 2016).

The respondents are the common thing in all of the four studies, regardless of their profile, sex, work experience, or geographic region, which express moderately positive attitudes toward inclusive physical education, i.e., a moderate level of self-efficacy for implementing inclusion in the classroom. None of the studies reported strongly negative attitudes; however, none indicated a high level of confidence for working with students with developmental disabilities. This pattern of moderate support, coupled with caution regarding practical implementation, is a consistent finding in the literature on inclusive physical education (Hutzler et al., 2019; Qi & Ha, 2012).

The findings of the study by Orlić et al. (2016), in which self-assessment of professional competence for working with children with disabilities was identified as the most significant predictor of positive attitudes towards inclusion ($\beta = .29$; $p < .00$), more significant than openness to experience and sex of the respondent, while grade point average and work experience did not show predictive value. This means that general academic achievement and length of work experience are insufficient for developing positive attitudes towards inclusion, and that it is necessary to provide specific professional content focused on working with students with disabilities within curricula.

Dorđić et al. (2014) reveal a significant structural gap in the system of professional development for teachers: only 1 out of 84 lower primary school teachers in the sample attended a seminar in inclusive physical education. However, 68% attended general seminars on inclusive teaching. The existing professional development system does not equip upper primary school teachers with the specific knowledge and skills needed to implement inclusive physical education, although general attitudes towards inclusion are generally positive. In addition, the most negative aspects of the teaching experience are stress, a feeling of under-training, and the fear that students with disabilities will take up too much time from other students, which is consistent with findings from comparative research in other national contexts (Karamani et al., 2024; Maksimović et al., 2022).

The study by Protić-Gava et al. (2018) shows that physical education teachers have significantly less experience working with students with disabilities than lower primary school teachers ($p = .01$), although both groups express positive attitudes. Geographical differences were also noted, with upper primary school teachers from the Mačva and Raška districts expressing a significantly greater need for training and development ($p = .02$), which may reflect the unequal availability of professional seminars and support in different parts of Serbia.

Jorgić et al. (2023) show that physical education teachers report the lowest self-efficacy in working with students with visual impairments ($M = 3.60$), compared to students with intellectual disabilities ($M = 3.77$) and physical disabilities ($M = 3.71$). However, the differences are not statistically significant. The absence of significant differences by sex and length of service further supports the findings of Orlić et al. (2016) that formal characteristics of teachers are not reliable indicators of self-efficacy and that specific professional training is a key determinant of readiness for inclusive teaching practice.

All samples are geographically limited to individual districts or cities; no study verifies the expressed attitudes through observation of actual teaching practice; and self-efficacy has been examined in one study only, and on a small sample. Future research should include more representative national samples, measure actual teaching practice through structured observation, and examine the effects of specific professional development programs on the attitudes and self-efficacy of physical education teachers in Serbia (Karamani et al., 2024; Maksimović et al., 2022).

In terms of thematic focus, the national research in the field of physical education and sports for children with disabilities and developmental difficulties has been concentrated in three areas: examining the effects of physical activity, describing the motor and morphological characteristics of this population, and examining teachers' attitudes. However, areas such as the quality of participation in inclusive physical education, students' perspectives, and the systemic conditions for implementing inclusion have remained completely unexplored in the national context.

Methodologically, the corpus exhibits several systemic limitations. First, intervention studies are dominated by pilot designs with small samples, without random assignment, and without long-term monitoring of effects. Second, descriptive-

comparative studies rarely control for variables that can significantly affect motor outcomes, such as physical activity level or socioeconomic status. Third, studies on teachers' attitudes rely exclusively on self-reports, without verifying findings through direct observation of teaching practice. Fourth, the population coverage is uneven. Certain categories of disabilities, such as autism and multiple disabilities, are completely omitted from the national research corpus.

Structured physical activity programs consistently produce positive effects in the motor, functional, and psychosocial domains of development of children with developmental disabilities, regardless of the type of disability or the activity used. Children with developmental disabilities perform significantly worse on motor skill tests compared to typically developing peers, with balance consistently being the most compromised motor domain. Physical education teachers, as well as lower primary school teachers, express moderately positive attitudes toward inclusion, but lack sufficient specific professional training for working with students with developmental disabilities, which represents a key obstacle to the high-quality implementation of inclusive physical education in practice.

Despite the aforementioned limitations, the analyzed works provide valuable insight into the state of the national scientific production in this field and clearly indicate the directions for further research. Future research in Serbia should focus on methodologically stronger designs with control groups and randomization, wider population coverage, longitudinal approaches, and examining the effects of specific teacher professional development programs, in accordance with the requirements of contemporary research practice in the field of adapted physical education and inclusive education (Grandisson et al., 2019; Maksimović et al., 2022; Qi & Ha, 2012).

Conclusion

This paper presents a review of national empirical research on children with disabilities and developmental difficulties in physical education and sports in Serbia, published between 2010 and 2025. In accordance with the set goal, 20 papers were analyzed and systematized into three thematic units.

National research production in this area is modest in scope, thematically narrow, and methodologically limited, but provides clear and consistent findings. Structured physical activity programs have positive effects on the development of children with developmental disabilities. These children achieve significantly poorer motor results compared to typically developing peers, and teachers have positive attitudes towards inclusion, but lack specific professional training for its implementation in physical education. The findings indicate the need for systemic improvement at two levels. At the research level, it is necessary to conduct more robust, methodologically sound research with broader population coverage and long-term monitoring of effects. At the level of educational practice, the results clearly indicate the need to develop specific professional development programs for teachers in adapted physical education as a prerequisite for quality inclusive teaching practice in Serbia.

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