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Original Article

Epidemiological Study of the Physical Ability to Practice Physical Education in Children with School Pathologies

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ABSTRACT

Introduction: The term "school pathologies" encompasses two distinct categories of health disorders: those that are caused or exacerbated by a lack of physical activity, and those that predominantly affect children of school age. This study employs an epidemiological approach to examine the physical aptitude of students in relation to their capacity to engage in physical education and sports (PE) classes. Our approach is based on an analysis of 93,870 medical records.

Methods: The survey is comprised of four distinct sections. The initial stage of the analysis entails an examination of the prevalence of confirmed impairments among school-aged children. Secondly, an evaluation of the physical aptitude to engage in physical education will be conducted. Thirdly, an analysis of the physical inaptitude of students to participate in physical education will be conducted.

Results: The results indicated a range of prevalence rates for various diagnosed and confirmed impairments, though no notable differences were observed between the sexes. Similarly, the majority of respondents attended school in urban areas (64.38%), and the most prevalent age group in this study was 16-18 years (59.59%;$p<.05$). In contrast, a prevalence of 40.20% of students with SEN (or 3.93‰ of the diagnosed population who are totally unfit for physical practice in PE) has been observed. However, this figure varies according to the types and characteristics of impairment. Three children with one type of impairment out of 1,000 pupils are unfit, which engenders physical inactivity at school due to medical restrictions. This phenomenon is not influenced by gender; however, it differs between geographical areas and age groups. This indicates a correlation between urbanization and age-related changes in physical disability and inactivity.

Conclusion: This study underscores the necessity of monitoring the physical activity of students with SEN, whether at school or elsewhere, to gain a more comprehensive understanding of well-being.

Introduction

The education of children and adolescents with special educational needs (SEN) has emerged as a significant concern for families, students, and professionals engaged in adapting their educational pathways,[1] because they need extra support, over and above the standard

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educational provision, to engage effectively with and benefit from the learning process .Physical activity (PA) is an important part of children's development of essential motor skills and strength through their physical involvement in play Physical activity (PA) is an important part of children's development of essential motor skills and strength through their physical involvement in play,[2] these skills include promoting healthy PA habits and improving social and cognitive skills.[3] Nevertheless, research has demonstrated that the level of interest among children with SEN in engaging in physical activity (PA) varies according to their stage of development, life circumstances and environmental readiness 3, in addition, the study found that there are positive short-term effects, including improvements in aerobic performance, muscular strength, physical and cognitive function, weight and body composition, social skills, relationships and psychological well-being.[4,5] It can be reasonably argued that physical and sports education (PES) represents a strategic approach that may potentially contribute to a reduction in drop-out rates and facilitate the integration of pupils facing difficulties at school.[6]

Greater coordination between all those involved in inclusive physical education (IPE), including parents, administrators, medical and paramedical staff, educators, trainers and other knowledgeable individuals, is required to ensure that inclusion in IPE is promoted in a comprehensive and harmonious manner.[7] It is recommended that healthcare staff encourage patients to engage in physical activity by inquiring about their current level of activity and by including tools such as the PAVS (Physical Activity Vital Sign) in the medical record. This enables patients to consider physical activity at the time of the consultation, after which clinicians can prescribe the full PA protocol with the necessary restrictions .[8] The assessment of pupils' physical abilities commences in early childhood and encompasses monitoring, surveillance and screening for motor delays, in addition to the examination of the knowledge, motivation and sentiments of the child and their family in relation to physical activity.[8] In light of the aforementioned considerations, a number of organisations have developed resources aimed at reinforcing the development of inclusive professional skills.[9,10]

In its 2023 annual report on the statistical collection of education data, the Ministry of National Education in Morocco reports that the ordinary schooling of students with SEN is 4.27‰ (n=37911). Of these students, 0.85‰ are motor, 0.23‰ are visual, 1.35‰ are mental, 0.42‰ are auditory, and 0.16‰ are schooled in integrated classes (Direction de la stratégie des statistiques et de la Planification, 2023). In contrast, the findings of this study indicated that there was no prevalence of other types of invisible disabilities, nor any information regarding the causes or age of onset of these disabilities, which are often suffered in silence. The objective of this study is to adopt an epidemiological approach to these disabilities in a large population of secondary school pupils. This will be achieved by analysing their medical records and their physical aptitude to participate in physical education lessons, as indicated by the medical certificates of physical aptitude issued by their physicians, in order to offer crucial indispensable insights for enhancing the physical inclusion and well-being of pupils in the school context, with a particular focus on physical education.

Methodology

Sample

The present study is predicated on a survey of the Beni Mellal-Khénifra region, which is situated in the centre of Morocco and encompasses five provinces: The region is comprised of the following five provinces: Azilal, Beni-Mellal, Fkih Ben Salah, Khénifra, and Khouribga. Collectively, these provinces encompass 135 communes, of which 16 are urban and 119 are rural.[11] The survey encompassed 93,870 student medical records from 69 public-sector secondary (high and middle schools). The records originated from the school health registers of pupils aged between 13 and 18. Of these records, 918 (9.78‰) were confirmed, comprising 207 (22.55%) girls and 711 (77.45%) boys. Of the confirmed cases, 591 (64.38%) originated from urban areas and 327 (35.62%) from rural areas. It should be noted that the study exclusively included students for whom medical records were available and up to date at the school and incomplete medical files are excluded.

Measuring instrument

The data collection process was conducted in three distinct phases. The initial stage of the process entailed securing the requisite authorizations from the Regional Directorate of the Ministry of Health and Social Protection in Beni Mellal-Khenifra on June 6, 2023 (N: 3528/23) and from the Regional Academy of the Ministry of National Education, Preschool and Sport in Beni Mellal-Khenifra on July 10, 2023 (N: 3656/23). This step was undertaken to validate and authorize the research process. Furthermore, the parents or legal guardians of all students enrolled in the study provided informed consent. All the parents gave their verbal consent for the results to be published by telephone. This was followed by a comprehensive review of international references pertaining to the categorization of disabilities in the school environment. In particular, the International Classification of Functioning, Disability and Health, as developed by the World Health Organization (WHO), was examined. The organization has developed a classification system that modifies the traditional classification of impairments into five groups: motor, sensory, psychological, intellectual, and disabling diseases.[12] Subsequently, an analysis was conducted of the medical records of the schools in question, with a particular focus on the medical opinions provided by the attending physicians regarding the physical aptitude of the children in question to engage in physical education classes, as well as the total exemption from such classes that was granted by the aforementioned physicians. The school medical records of students contain crucial information pertaining to their overall health, medical history and specific treatments. These records encompass data on medical history, allergies, and vaccinations, in addition to detailed information regarding the students' current health status, including chronic pathologies, prescribed medication, and ongoing treatments. With regard to physical fitness to take part in Physical Education and Sport (PE) classes, these files indicate authorisations or restrictions concerning the practice of physical activities, accompanied by medical recommendations aimed at adapting certain interventions to the particular health needs of the pupils. The present study focused

on extracting the following data: gender, age group, area of schooling and physical ability. The study focused on two classes: those who were totally physicaly inifitness to participate in the PE class and those who were physicaly fitness to participate in the PE class.

Data analysis

The resulting data were analyzed using the statistical software package SPSS, version 27.0.1.0. In this stage, the distribution of confirmed impairments among all diagnosed pupils was analyzed, as was the distribution of pupils unfit to take part in PE lessons. The difference between these two distributions was then examined according to gender, age, and schooling zone using the Chi-squared test.

Results

This section presents three lines of analysis. The first examines the distribution of disabilities confirmed at the time of diagnosis in the school environment according to sex, age, and area. Subsequently, an analysis is conducted to determine the prevalence of pupils who are physically fit and unfit, as determined by school health doctors, who participate in PE classes. Subsequently, the distribution of physically unfit pupils who participated in their PE lessons was examined according to sex, age, and schooling zone.

Analysis of differences in the prevalence of disabilities among students with special educational needs (SEN)

Table 1 presents the distribution of confirmed impairments (n=918; 9.78‰) among diagnosed pupils (N=93870) in public schools, as well as the difference between the two according to gender, age, and area, as determined by the Chi-squared test. Boys are more frequently affected than girls by a range of impairment types, including motor, intellectual, and sensory, as well as disabling diseases. To illustrate, in the context of motor impairments, upper and lower limb amputations affect 78.57% and 75.44% of boys, respectively, in comparison to 21.43% and 24.56% of girls. Similarly, with regard to intellectual disabilities, 80.28% of cases are found in boys, while only 19.72% are found in girls. A similar pattern is observed with regard to sensory impairments and disabling diseases, indicating a systematic higher prevalence of impairments among boys.

A comparative analysis of the prevalence of disabilities among adolescents aged 16-18 and those aged 12-15 reveals that the former group is more affected overall, with the exception of certain impairments. For instance, in the context of motor disabilities, hemiplegic paralysis and lower-limb amputations are predominantly observed in the 16-18 age group, with prevalence rates reaching 100% in certain instances. Additionally, psychological and intellectual disabilities are more prevalent in the 16-18 age group, comprising 56.14% and 80.23% of cases, respectively. However, certain disabling illnesses, such as metabolic and respiratory diseases, are more prevalent in younger age groups (12-15), with 56.34% and 57.55% of cases, respectively.

The geographical distribution of these impairments demonstrates a higher prevalence in urban areas compared to rural ones. In the case of motor impairments, the data indicate that 66.59% of upper-limb amputations and 75.36% of lower-limb amputations occurred

Table 1. Distribution and difference of deficiencies according to sex

Pathologies			Sex							Total	
			Female			Male			Chi2		
			n (% relatif)	%/918 Confirmed	‰/N Diagnosed	n (% relatif)	%/918 Confirmed	‰/N Diagnosed		n (%) Confirmed	‰/N Diagnosed
General population included	Motor	Upper amputation	9(21.43%)	0.98%	0.10‰	33(78.57%)	3.59%	0.35‰	NS	42(4.58%)	0.45‰
		Lower amputation	14(24.56%)	1.53%	0.15‰	43(75.44%)	4.68%	0.46‰	NS	57(6.21%)	0.61‰
		Hemiplegic paralysis	11(26.19%)	1.20%	0.12‰	31(73.81%)	3.38%	0.33‰	NS	42(4.58%)	0.45‰
		Osteoarticular	22(25.58%)	2.40%	0.23‰	64(74.42%)	6.97%	0.68‰	NS	86(9.37%)	0.92‰
	Psychological		17(17.35%)	1.85%	0.18‰	81(82.65%)	8.82%	0.86‰	NS	98(10.68%)	1.04‰
	Intellectual		14(19.72%)	1.53%	0.15‰	57(80.28%)	6.21%	0.61‰	NS	71(7.73%)	0.76‰
	Sensory	Visual	15(21.13%)	1.63%	0.16‰	56(78.87%)	6.10%	0.60‰	NS	71(7.73%)	0.76‰
		Auditory	7(25.00%)	0.76%	0.07‰	21(75.00%)	2.29%	0.22‰	NS	28(3.05%)	0.30‰
	Disabling diseases	Metabolic	29(23.02%)	3.16%	0.31‰	97(76.98%)	10.57%	1.03‰	.032	126(13.73%)	1.34‰
		Respiratory	22(22.22%)	2.40%	0.23‰	77(77.78%)	8.39%	0.82‰	NS	99(10.78%)	1.05‰
		Cardiovascular	34(26.56%)	3.70%	0.36‰	94(73.44%)	10.24%	1.00‰	NS	128(13.94%)	1.36‰
		Immune	13(18.57%)	1.42%	0.14‰	57(81.43%)	6.21%	0.61‰	NS	70(7.63%)	0.75‰
	Total		207(22.55%)	22.55%	2.21‰	711(77.45%)	77.45%	7.57‰	-	918(100%)	9.78‰
Population physically unfit for PE lessons	Motor	Upper amputation	2(14.29%)	0.22%	0.02‰	12(85.71%)	1.31%	0.13‰	NS	14(1.53%)	0.15‰
		Lower amputation	2(14.29%)	0.22%	0.02‰	12(85.71%)	1.31%	0.13‰	NS	14(1.53%)	0.15‰
		Hemiplegic paralysis	2(6.90%)	0.22%	0.02‰	27(93.10%)	2.94%	0.29‰	NS	29(3.16%)	0.31‰
		Osteoarticular	2(6.90%)	0.22%	0.02‰	27(93.10%)	2.94%	0.29‰	NS	29(3.16%)	0.31‰
	Psychological		8(19.05%)	0.87%	0.09‰	34(80.95%)	3.70%	0.36‰	NS	42(4.58%)	0.45‰
	Intellectual		4(9.30%)	0.44%	0.04‰	39(90.70%)	4.25%	0.42‰	NS	43(4.68%)	0.46‰
	Sensory	Visual	4(13.79%)	0.44%	0.04‰	25(86.21%)	2.72%	0.27‰	NS	29(3.16%)	0.31‰
		Auditory	2(14.29%)	0.22%	0.02‰	12(85.71%)	1.31%	0.13‰	NS	14(1.53%)	0.15‰
	Disabling diseases	Metabolic	8(19.05%)	0.87%	0.09‰	34(80.95%)	3.70%	0.36‰	NS	42(4.58%)	0.45‰
		Respiratory	6(13.95%)	0.65%	0.06‰	37(86.05%)	4.03%	0.39‰	NS	43(4.68%)	0.46‰
		Cardiovascular	8(14.04%)	0.87%	0.09‰	49(85.96%)	5.34%	0.52‰	NS	57(6.21%)	0.61‰
		Immune	6(21.43%)	0.65%	0.06‰	22(78.57%)	2.40%	0.23‰	NS	28(3.05%)	0.30‰
	Total		54(14.06%)	5.88%	0.58‰	330(85.94%)	35.95%	3.52‰	-	384(41.83%)	4.09‰

All values are expressed as frequencies (percentages), NS. Not significant, significance $p < .05$.

in urban areas. Similarly, psychological and intellectual impairments were more prevalent in urban areas, representing 71.44% and 59.17% of cases, respectively. Similarly, disabling illnesses such as metabolic and cardiovascular diseases exhibit a comparable profile, with the majority of cases occurring in urban areas, often exceeding 60%.

Distribution of physical aptitude and inaptitude to participate in PE lessons among pupils with special educational needs according to school health doctors

Table 2 illustrates the distribution of physical aptitude among students with SEN who participated in the EPS course facilitated by school health professionals. A total of 59.80% (5.85‰) of students who are physically fit participated in the EPS class, while 40.20% (3.93‰) were unable to do so. This distribution is significantly different between the two groups and varies according to the type of impairment. The impairments most frequently associated with an inability to participate in PE classes are metabolic (9.15%; 0.89‰), cardiovascular (7.73%; 0.76‰), and osteoarticular (6.21%; 0.61‰) diseases. Conversely, the most prevalent conditions associated with physical inaptitude were cardiovascular (6.21%; 0.61‰), psychological (4.58%; 0.45‰), metabolic (4.58%; 0.45‰), and respiratory (4.68%; 0.46‰) disorders.

Analysis of physical inaptitude to participate in PE classes according to socio-demographic factors

Table 3 presents a comparison of the prevalence of physical inaptitude to participate in physical

Table 2. Distribution of physical aptitude to participate in PE lessons among students with special educational needs

Pathologies		Participation statutes in PE lessons				Chi2	Total	
		No Exempted from PE classes		Exempted from PE lessons				
		n (% relatif)	%/918 Confirmed	‰/N Diagnosed	n (% relatif)	%/918 Confirmed	‰/N Diagnosed		n (%) Confirmed Con	‰/N Diagnosed
Motor	Upper amputation	28(66.67%)	3.05%	0.30‰	14(33.33%)	1.53%	0.15‰	.001	42(4.58%)	0.45‰
	Lower amputation	43(75.44%)	4.68%	0.46‰	14(24.56%)	1.53%	0.15‰	.006	57(6.21%)	0.61‰
	Hemiplegic paralysis	28(66.67%)	3.05%	0.30‰	14(33.33%)	1.53%	0.15‰	.000	42(4.58%)	0.45‰
	Osteoarticular	57(66.28%)	6.21%	0.61‰	29(33.72%)	3.16%	0.31‰	.000	86(9.37%)	0.92‰
Psychological		56(57.14%)	6.10%	0.60‰	42(42.86%)	4.58%	0.45‰	.000	98(10.68%)	1.04‰
Intellectual		28(39.44%)	3.05%	0.30‰	43(60.56%)	4.68%	0.46‰	.000	71(7.73%)	0.76‰
Sensory	Visual	42(59.15%)	4.58%	0.45‰	29(40.85%)	3.16%	0.31‰	.000	71(7.73%)	0.76‰
	Auditory	14(50.00%)	1.53%	0.15‰	14(50.00%)	1.53%	0.15‰	.000	28(3.05%)	0.30‰
Disabling diseases	Metabolic	84(66.67%)	9.15%	0.89‰	42(33.33%)	4.58%	0.45‰	.000	126(13.73%)	1.34‰
	Respiratory	56(56.57%)	6.10%	0.60‰	43(43.43%)	4.68%	0.46‰	.000	99(10.78%)	1.05‰
	Cardiovascular	71(55.47%)	7.73%	0.76‰	57(44.53%)	6.21%	0.61‰	.000	128(13.94%)	1.36‰
	Immune	42(60.00%)	4.58%	0.45‰	28(40.00%)	3.05%	0.30‰	.000	70(7.63%)	0.75‰
Total		549(59.80%)	59.80%	5.85‰	369(40.20%)	40.20%	3.93‰	-	918(100%)	9.78‰

All values are expressed as frequencies (percentages), NS. Not significant, significance $p < .05$.

Table 3. Distribution and difference of deficiencies according to Age

	Pathologies		Age (yr)							Total	
			12-15			16-18			Chi2		
			n (% relatif)	%/918 Confirmed	‰/N Diagnosed	n (% relatif)	%/918 Confirmed	‰/N Diagnosed		n (%) Confirmed	‰/N Diagnosed
General population included	Motor	Upper amputation	0(0.00%)	0.00%	0.00‰	42(100%)	4.58%	0.45‰	.000	42(4.58%)	0.45‰
		Lower amputation	15(26.25%)	1.63%	0.16‰	42(73.75%)	4.58%	0.45‰	.026	57(6.21%)	0.61‰
		Hemiplegic paralysis	0(0.00%)	0.00%	0.00‰	42(100%)	4.58%	0.45‰	.000	42(4.58%)	0.45‰
		Osteoarticular	29(33.72%)	3.16%	0.31‰	57(66.28%)	6.21%	0.61‰	NS	86(9.37%)	0.92‰
	Psychological		43(43.86%)	4.68%	0.46‰	55(56.14%)	5.99%	0.59‰	NS	98(10.68%)	1.04‰
	Intellectual		14(19.77%)	1.53%	0.15‰	57(80.23%)	6.21%	0.61‰	.000	71(7.73%)	0.76‰
	Sensory	Visual	29(40.83%)	3.16%	0.31‰	42(59.17%)	4.58%	0.45‰	NS	71(7.73%)	0.76‰
		Auditory	14(50.00%)	1.53%	0.15‰	14(50.00%)	1.53%	0.15‰	NS	28(3.05%)	0.30‰
	Disabling diseases	Metabolic	71(56.34%)	7.73%	0.76‰	55(43.66%)	5.99%	0.59‰	.000	126(13.73%)	1.34‰
		Respiratory	57(57.55%)	6.21%	0.61‰	42(42.45%)	4.58%	0.45‰	.000	99(10.78%)	1.05‰
		Cardiovascular	56(43.76%)	6.10%	0.60‰	72(56.24%)	7.84%	0.77‰	NS	128(13.94%)	1.36‰
		Immune	43(61.42%)	4.68%	0.46‰	27(38.58%)	2.94%	0.29‰	.000	70(7.63%)	0.75‰
	Total		371(40.41%)	40.41%	3.95‰	547(59.59%)	59.59%	5.83‰	-	918(100%)	9.78‰
General population included	Motor	Upper amputation	0(0.00%)	0.00%	0.00‰	14(100%)	1.53%	0.15‰	.035	14(1.53%)	0.15‰
		Lower amputation	0(0.00%)	0.00%	0.00‰	14(100%)	1.53%	0.15‰	.035	14(1.53%)	0.15‰
		Hemiplegic paralysis	0(0.00%)	0.00%	0.00‰	14(100%)	1.53%	0.15‰	.035	14(1.53%)	0.15‰
		Osteoarticular	0(0.00%)	0.00%	0.00‰	29(100%)	3.16%	0.31‰	.001	29(3.16%)	0.31‰
	Psychological		14(33.33%)	1.53%	0.15‰	28(66.67%)	3.05%	0.30‰	.031	42(4.58%)	0.45‰
	Intellectual		0(0.00%)	0.00%	0.00‰	43(100%)	4.68%	0.46‰	.000	43(4.68%)	0.46‰
	Sensory	Visual	14(48.28%)	1.53%	0.15‰	15(51.72%)	1.63%	0.16‰	.000	29(3.16%)	0.31‰
		Auditory	0(0.00%)	0.00%	0.00‰	14(100%)	1.53%	0.15‰	.035	14(1.53%)	0.15‰
	Disabling diseases	Metabolic	14(33.33%)	1.53%	0.15‰	28(66.67%)	3.05%	0.30‰	.031	42(4.58%)	0.45‰
		Respiratory	14(32.56%)	1.53%	0.15‰	29(67.44%)	3.16%	0.31‰	.041	43(4.68%)	0.46‰
		Cardiovascular	14(24.56%)	1.53%	0.15‰	43(75.44%)	4.68%	0.46‰	NS	57(6.21%)	0.61‰
		Immune	14(50.00%)	1.53%	0.15‰	14(50.00%)	1.53%	0.15‰	.000	28(3.05%)	0.30‰
	Total		84(22.76%)	9.15%	0.89‰	285(77.24%)	31.05%	3.04‰	-	369(40.20%)	3.93‰

All values are expressed as frequencies (percentages), NS. Not significant, significance $p < .05$.

Table 4. Distribution and difference of impairments by schooling zone

	Pathologies		Schooling zone							Total	
			Urban			Rural			Chi2		
			n (% relatif)	%/918 Confirmed	‰/N Diagnosed	n (% relatif)	%/918 Confirmed	‰/N Diagnosed		n (%) Confirmed	‰/N Diagnosed
General population included	Motor	Upper amputation	28(66.59%)	3.05%	0.30‰	14(33.41%)	1.53%	0.15‰	.013	42(4.58%)	0.45‰
		Lower amputation	43(75.36%)	4.68%	0.46‰	14(24.64%)	1.53%	0.15‰	NS	57(6.21%)	0.61‰
		Hemiplegic paralysis	28(66.59%)	3.05%	0.30‰	14(33.41%)	1.53%	0.15‰	.013	42(4.58%)	0.45‰
		Osteoarticular	43(50.00%)	4.68%	0.46‰	43(50.00%)	4.68%	0.46‰	.000	86(9.37%)	0.92‰
	Psychological		70(71.44%)	7.63%	0.75‰	28(28.56%)	3.05%	0.30‰	.004	98(10.68%)	1.04‰
	Intellectual		42(59.17%)	4.58%	0.45‰	29(40.83%)	3.16%	0.31‰	.000	71(7.73%)	0.76‰
	Sensory	Visual	28(39.46%)	3.05%	0.30‰	43(60.54%)	4.68%	0.46‰	.000	71(7.73%)	0.76‰
		Auditory	28(100%)	3.05%	0.30‰	0(0.00%)	0.00%	0.00‰	.002	28(3.05%)	0.30‰
	Disabling diseases	Metabolic	84(66.64%)	9.15%	0.89‰	42(33.36%)	4.58%	0.45‰	.000	126(13.73%)	1.34‰
		Respiratory	56(56.59%)	6.10%	0.60‰	43(43.41%)	4.68%	0.46‰	.000	99(10.78%)	1.05‰
		Cardiovascular	85(66.43%)	9.26%	0.91‰	43(33.57%)	4.68%	0.46‰	.000	128(13.94%)	1.36‰
		Immune	56(79.95%)	6.10%	0.60‰	14(20.05%)	1.53%	0.15‰	NS	70(7.63%)	0.75‰
	Total		591(64.38%)	64.38%	6.30‰	327(35.62%)	35.62%	3.48‰	-	918(100%)	9.78‰
General population included	Motor	Upper amputation	0(0.00%)	0.00%	0.00‰	14(100%)	1.53%	0.15‰	.031	14(1.53%)	0.15‰
		Lower amputation	0(0.00%)	0.00%	0.00‰	14(100%)	1.53%	0.15‰	.031	14(1.53%)	0.15‰
		Hemiplegic paralysis	0(0.00%)	0.00%	0.00‰	14(100%)	1.53%	0.15‰	.031	14(1.53%)	0.15‰
		Osteoarticular	15(51.72%)	1.63%	0.16‰	14(48.28%)	1.53%	0.15‰	.000	29(3.16%)	0.31‰
	Psychological		14(33.33%)	1.53%	0.15‰	28(66.67%)	3.05%	0.30‰	.048	42(4.58%)	0.45‰
	Intellectual		15(34.88%)	1.63%	0.16‰	28(65.12%)	3.05%	0.30‰	.021	43(4.68%)	0.46‰
	Sensory	Visual	29(100%)	3.16%	0.31‰	0(0.00%)	0.00%	0.00‰	.000	29(3.16%)	0.31‰
		Auditory	0(0.00%)	0.00%	0.00‰	14(100%)	1.53%	0.15‰	.031	14(1.53%)	0.15‰
	Disabling diseases	Metabolic	14(33.33%)	1.53%	0.15‰	28(66.67%)	3.05%	0.30‰	.048	42(4.58%)	0.45‰
		Respiratory	29(67.44%)	3.16%	0.31‰	14(32.56%)	1.53%	0.15‰	.000	43(4.68%)	0.46‰
		Cardiovascular	29(50.88%)	3.16%	0.31‰	28(49.12%)	3.05%	0.30‰	.000	57(6.21%)	0.61‰
		Immune	14(50.00%)	1.53%	0.15‰	14(50.00%)	1.53%	0.15‰	.000	28(3.05%)	0.30‰
	Total		159(43.09%)	17.32%	1.69‰	210(56.91%)	22.88%	2.24‰	-	369(40.20%)	3.93‰

All values are expressed as frequencies (percentages), NS. Not significant, significance $p < .05$.

education (PE) classes according to school health doctors, stratified by gender, age, and school zone. The prevalence of impairments is higher among male students than female students in nearly all categories. For instance, in the context of upper amputations, 78.57% of cases involved male patients, while only 21.43% involved female patients. Similarly, in the case of lower amputations, 75.44% of cases involved males. This trend is similarly evident with regard to psychological, intellectual, and sensory impairments and disabling diseases, where boys are disproportionately affected. For instance, 82.65% of cases of psychological impairment and 77.78% of cases of sensory impairment are male. This illustrates the greater vulnerability of males to these prescribed physical disabilities. A comparison of age groups reveals that, with the exception of certain disabling diseases, the majority of physical inaptitude affect individuals between the ages of 16 and 18. For instance, in the context of upper and lower limb amputations, 100% and 73.75% of cases, respectively, involve individuals within the age range of 16 to 18. In contrast, Psychological and intellectual Impairments are more prevalent in the elderly population, with 56.14% and 80.23% of cases, respectively. However, certain disabling illnesses, such as metabolic and respiratory diseases, are more prevalent among individuals aged 12-15, with 56.34% and 57.55% of cases, respectively. With respect to geographical distribution, the prevalence of physical inaptitude is observed to be higher in urban than in rural areas. As an illustration, the data indicate that 66.59% of cases of upper amputation and 75.36% of cases of lower amputation occur in urban areas. Similarly, 71.44% of psychological impairments and 59.17% of intellectual impairments manifest in urban settings. Similarly, disabling illnesses such as metabolic and cardiovascular diseases manifest a comparable profile, exhibiting higher proportions in urban areas.

Discussion

The findings of our study indicate a significant prevalence of disabilities among students at both the middle school and high school levels. The prevalence of motor impairments was notably high, at approximately 15.37%. This figure is consistent with data from the West Coast district of South Africa, where 14.5% of kindergarten pupils exhibited significant motor impairments.[13] However, our findings diverge from those of certain studies that have indicated a higher prevalence of motor impairments among boys compared to girls.[14] Our results did not reveal a significant difference between the sexes in this regard. With regard to geographical distribution, the majority of students with special educational needs (SEN) were educated in urban areas (64.38%). This finding aligns with the observations of Tsai et al. (2018) in Taiwan, where rural areas demonstrated a higher prevalence of motor disabilities than urban areas.[14] This discrepancy may be attributed to enhanced accessibility to screening and diagnostic services in urban settings.[15] Furthermore, the process of urbanization and the presence of medical facilities have been observed to considerably diminish the prevalence of disabilities.[16] With regard to disabling diseases, our study revealed a prevalence of 13.73% for metabolic diseases. This rate is lower than the 45.5% reported in Tunisia according to the IDF definition.[17] Cardiovascular conditions constituted

13.94% of cases, which is consistent with the findings of Vanhelst. These researchers determined that 16% of boys and 7.7% of girls were at elevated risk of developing future cardiovascular disease.[18] Respiratory diseases, including asthma, were identified in 10.78% of the student population.[19] This prevalence is consistent with data from France, where asthma affects approximately 480,000 children, or approximately three to four asthmatic teenagers per class of 30 pupils.[20]

Additionally, the findings indicated a significant prevalence of psychological (10.68%) and intellectual (7.73%) impairment. These figures are comparable to those observed in a survey of 16 sub-Saharan African countries, in which one in seven adolescents exhibited notable psychological impairments.[21] These disorders are likely to be exacerbated by a number of factors, including stigmatization, difficulties at school, risky behavior, and physical health problems.[22–24] With regard to sensory impairments, the study revealed a total prevalence of 10.78%, comprising 7.73% visual impairments and 3.05% hearing impairments. These figures are slightly lower than those observed in Djibouti, where the prevalence of visual impairment among young people ranges from 9.9% to 37.6%, and hearing impairment from 12.2% to 14.5% 25. It is noteworthy that the enrollment of SEN pupils is significantly associated with the age of education at qualifying secondary school (16-18 years) in the majority of cases (59.59%; $p < 0.05$). This indicates that these students are able to benefit from an equitable education as a result of the implementation of support mechanisms such as local units for school inclusion (ULIS).[26]

Nevertheless, our study revealed a disturbing prevalence of 40.20% of students who are physically unfit to engage in physical education and sports (PE) classes, which corresponds to approximately 3.93‰ of the diagnosed population. Consequently, these students are entirely excused from PE classes, a notable distinction from those who are physically fit. The degree of unfitness varies according to the specific types and characteristics of impairments.[27] Students with severe disabilities may be assigned passive tasks or may be entirely exempt from PE lessons, based on the teacher's assessment of their ability to engage in adapted physical activity.[28,29] Cardiovascular, respiratory, and metabolic diseases are among the primary causes of physical disability. Cardiovascular conditions impose limitations on exercise capacity and tolerance.[30,31] Respiratory diseases, such as asthma, result in respiratory difficulties during physical exertion, necessitating monitoring and adaptation of activities to prevent attacks.[31] Individuals with metabolic diseases, such as diabetes, require particular attention during physical activity to ensure the maintenance of an appropriate glycemic balance.[31] In accordance with the guidelines endorsed by the College in July 2022, a sedentary lifestyle, typified by an extended period of sitting or lying down, is associated with an array of health hazards, including obesity, cardiovascular disease, and diabetes.[32] The study's findings indicate that three out of every one thousand students with medical conditions are deemed unfit to participate in physical education classes by their healthcare providers. This translates to a significant proportion of students being unable to engage in physical activity at school. This behavior is associated with a 40.20% prevalence of total physical inaptitude in physical education settings.

A gender-based analysis of physical fitness reveals that girls are less likely to hold an unfavorable opinion of their physical fitness (14.06%) than boys (85.94%). However, this variation is not statistically significant when comparing disability groups. Moreover, the 16-18 age group is significantly more affected (77.24%) than the 12-15 age group (22.76%). This distribution is also more prevalent in urban areas (56.91%) than in rural areas (43.09%). These findings are at odds with those of certain studies that posit that students in rural areas typically receive more physical education (PE) instruction than their urban counterparts.[27,33] However, an alternative study lends support to our findings, concluding that rural SEN boys are more physically active than girls.[28] The inability to participate in physical education (PE) has significant implications for students' overall lifestyle patterns, a sedentary lifestyle is of particular concern among young people, as it is associated with a range of physical and mental health risks.[34] A survey revealed that only 9% of girls and 16% of boys aged 13 achieve the recommended levels of physical activity, with a notable decline with age.[35]

Conclusion

This study underscores the vital necessity of incorporating students with special educational needs (SEN) into the Moroccan educational system, with a specific emphasis on physical education (PE) classes. The findings illustrate a significant prevalence of motor, psychological, intellectual, and sensory impairments, with particular attention paid to the distribution of these disabilities by gender, age group, and geographical region. The analysis indicates that males are more prone to these disabilities, and adolescents between the ages of 16 and 18 demonstrate elevated rates of physical inaptitude in comparison to their younger counterparts. Furthermore, the findings illustrate a disparity between urban and rural regions, where socio-economic circumstances and accessibility to healthcare play a pivotal role in shaping students' health outcomes. The objective of this study is to raise awareness among policymakers and educators about the necessity of developing tailored inclusion programs that promote student well-being and engagement in academic activities 5. To this end, the study proposes the incorporation of physical fitness certificates.

The extent of this inclusion is influenced by the sense of pedagogical competence,[28,29] and by teachers' personal and family history.[29] It is therefore imperative that a comprehensive approach be adopted which considers both individual needs and environmental factors if the goal of promoting inclusive and equitable education for all students in Morocco is to be achieved. The present study is subject to several limitations. Firstly, the study exclusively included students who possessed complete and up-to-date medical records, which could have resulted in a selection bias. The inaccessibility of certain medical records due to confidentiality restrictions or administrative resistance is also a potential limitation. Furthermore, the exclusion of files for some students due to the absence of complete medical information could limit the representativeness of the sample, thus affecting the generalizability of the results. Finally, the potential impact of unconsidered external factors, such as parents' socio-economic status and access to healthcare, on the results obtained cannot be discounted.

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Conflicts of Interest

The authors declare no conflict of interest.

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