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EXEMPTIONS FROM THE PHYSICAL EDUCATION CLASSES ON THE BACKGROUND OF GRADES IN MIDDLE SCHOOL – A CASE STUDY

ZWOLNIENIA Z PRZEDMIOTU WYCHOWANIE FIZYCZNE NA TLE OCEN W GIMNAZJUM – STUDIUM PRZYPADKU

Słowa kluczowe: wychowanie fizyczne, zwolnienia z zajęć, zależność statystyczna
Key words: physical education, exemptions from the classes, statistical dependence

1. Introduction

The Council of Europe¹ defines sport as "all forms of physical activity which, through casual or organised participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels". The correlation between lack

¹ European Commission, 2007a. White Paper on Sport. COM(2007) 391 final. Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0391:FIN:EN:PDF> (Accessed 25 June 2015).

of physical activity and the occurrence of overweight, obesity and a number of diseases, including cardiovascular diseases such as heart attack and stroke, is well known. The European Commission in the White Paper on Sport (2007) deliberated on the societal, cultural and economic dimension of sport. They emphasize the key role of sport in the development of young people: any kind of physical activity, whether in school physical education lessons or extracurricular activities, would result in health benefits, but also could help in personal and education growth (see results of works of Taras² and Satcher³).

As Pierre de Coubertin, a founder of the modern Olympic Games, said “for each individual, sport is a possible source for inner improvement”. Nowadays all modern countries recognize the importance of physical activity in life as well as the need of teaching physical education in schools. It is crucial for young people to begin as soon as possible a contact with sport. This early knowledge will influence their later education and healthier adult’s life. According to the European Union Physical Activity Guidelines⁴, recommend physical activity time for school-age children should last at least one hour every day. In all European countries physical education is compulsory in primary and secondary education. In almost all of them assessment of progress is formally graded⁵. The importance of physical education, in non-European countries such as the United States of America is even greater. According to the School Health Policies and Practices Study⁶ between 2000 and 2012 in the USA the percentage of states that provided plans or tools for assessing or evaluating students in middle school physical education increased from 33.3% to 64.0%, whereas in high school from 32.0% to 64.7%.

Around the world national strategies to promote the development of physical education and physical activity are being implemented for years (see Physical Education and Sport at School in Europe Eurydice Report). Currently in Poland the national strategy is defined⁷ in the “Sports Devel-

² H. Taras, *Physical Activity and Student Performance at School*, “Journal of School Health” 2005, 75 (6) pp. 214-218.

³ D. Satcher, *Healthy and Ready to Learn: Research shows that nutrition and physical activity affect student academic achievement*, “Educational Leadership” 2005, 63, p. 26-30.

⁴ EU Working Group ‘Sport & Health’, 2008. EU Physical Activity Guidelines. Recommended Policy Actions in Support of Health-Enhancing Physical Activity. Available at: http://ec.europa.eu/sport/library/policy_documents/eu-physical-activity-guidelines-2008_en.pdf (Accessed 25 June 2015).

⁵ Except early years in school in some countries.

⁶ SHPPS 2012. Available at: http://www.cdc.gov/healthyyouth/shpps/2012/factsheets/pdf/FS_PhysicalEducation_SHPPS2012.pdf (Accessed 25 June 2015).

⁷ Polish Ministry of Sport and Tourism, 23 January 2007.

opment Strategy in Poland, 2007-15". Results of the audit of the Supreme Audit Office⁸ for the years 2009-2012 showed that implemented solutions seems to be insufficient for the promotion of physical education. The report pointed out that there is a reasonable risk that performed initiatives will not affect enough trends in the development of physical fitness and building a pro-health attitudes among children and adolescents. One of the biggest issues is the decreasing attendance at physical education classes. What is more, the number of pupils with permanent exemptions from physical education is also increasing. One of the reasons, mentioned explicitly by the Ombudsman for Children Marek Michalak in the letter to the Minister of National Education⁹, is the fear that the poor grade from physical education will badly influence the overall grade average on the school certificate.

The goal of this study is to perform empirical analysis based on the real school grades, which verifies the hypothesis, that exemptions from physical education are more frequent in the group of people with better grades from other subjects. For the research the data from one middle school were used. To answer the research question, the correlation between overall grade average of pupils with the exemptions and those, who get grades from physical education, is calculated.

This paper is composed of five sections. The statistics related to physical education in the Polish education system with particular emphasis on exemptions from physical education are in section 2. In that section also the existing law and the discussion about possible reasons of getting exemptions from physical education are described. In section 3 the data description and basic descriptive statistics of these data are presented, whereas in section 4 the results of empirical analysis are gathered. This paper ends with the brief summary in section 5.

2. Exemptions from physical education in Poland

There are many reasons for which pupils might not be able to take active part in the physical education classes. The major part of those reasons are health-related, so exemptions could be permanently or temporarily. Procedures of getting exemption from physical education differs from country to

⁸ Supreme Audit Office: Wychowanie fizyczne i sport w szkołach publicznych i niepublicznych. Informacja o wynikach kontroli Najwyższej Izby Kontroli (nr P/12/067), NIK 2013.

⁹ ZEW/500/4/2014/ZA. Available at: http://brpd.gov.pl/sites/default/files/scan_from_a_xerox_workcentre.pdf (Accessed 25 June 2015).

country: in some a parent note is enough, in some a medical certificate testifying to inability to perform physical education activities is required. The procedures across the Europe in the school year 2011/12 are pictured on the map in Figure 1.

According to the law¹⁰ in schools in Poland a pupil can get an exemption from physical education classes only from the headmaster based on the opinion about the limited ability of a pupil to participate in these activities, issued by a doctor. In these cases of exemptions from physical education classes, in pupil's documentation instead of a grade, information about an exemption is written. Those exemptions, especially permanent ones, intended to be rare. Unfortunately number of pupils with permanent exemptions from physical education is quite high and increasing over time.

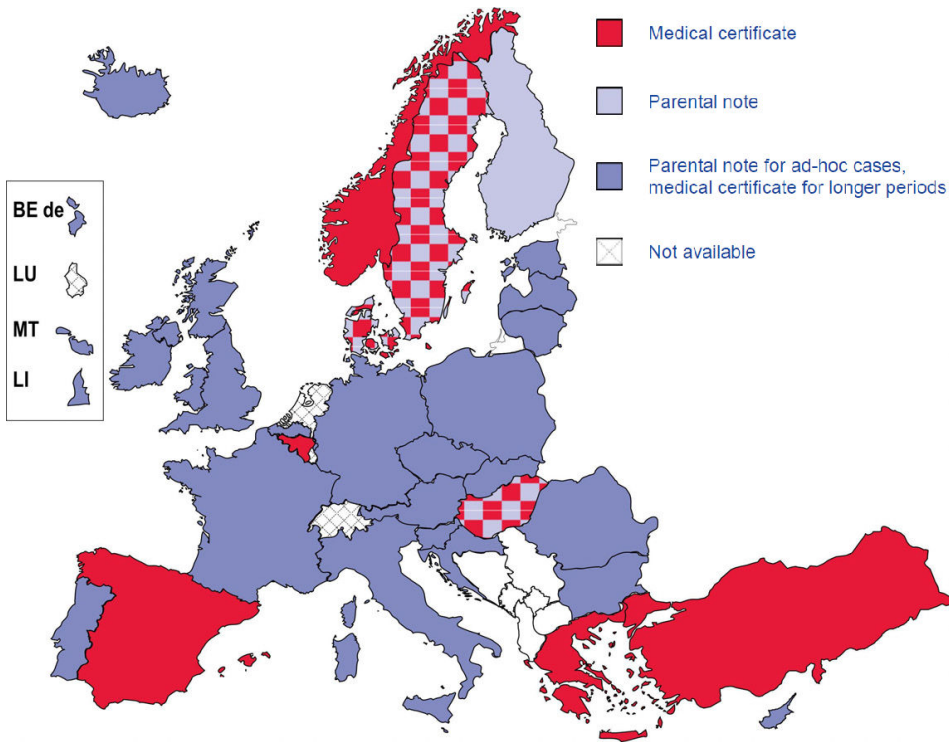


Figure 1. Exemptions from physical education in primary and lower secondary education, 2011/12

Source: Physical Education and Sport at School in Europe Eurydice Report, 2013

¹⁰ §8 of regulation of the Minister of National Education from 30 April 2007. On the conditions and manner of assessing, classifying and promoting pupils and students and conducting tests and examinations in public schools (DzU 2007, Nr 83, poz. 562).

According to the audit of the Supreme Audit Office¹¹ the average number of pupils with exemptions from physical education classes (based on a medical opinion) in the school year 2012/2013 was equal to:

- 2% in the classes IV-VI of the primary school,
- 5% in middle schools,
- 12% in secondary schools.

What is even more frightened, is the fact that attendance frequencies of pupils taking active part in the classes is much lower. In the same document averages of pupils not taking active part in physical education classes are given:

- 15% in the classes IV-VI of the primary school,
- 23% in middle schools,
- 30% in secondary schools.

Interesting thing is the percentage of pupils that unwillingly take part in the physical education classes increases at subsequent stages of education:

- 6% in the classes IV-VI of the primary school,
- 14% in middle schools,
- 19% in secondary schools.

Statistics of attendance frequencies at the physical education classes in the school years 2009/10 – 2011/12 are given in Figure 2. It is worth to emphasize that in each of the school years under consideration, average attendance of pupils at other classes was from 2% to over 6% higher than for physical education classes.

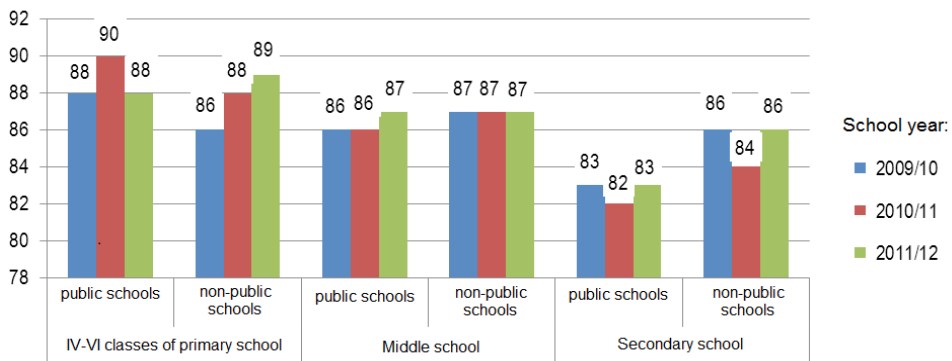


Figure 2. Attendance frequencies at the physical education classes in the school years 2009/10 – 2011/12 (pupils absent and not taking active part in classes)

Source: own elaboration based on the audit of the Supreme Audit Office: *Wychowanie fizyczne i sport w szkołach publicznych i niepublicznych* (nr P/12/067), NIK 2013

¹¹ *Wychowanie fizyczne i sport w szkołach publicznych i niepublicznych* (nr P/12/067), NIK 2013.

The actual attendance frequencies at the physical education classes¹², based on the given week at the beginning of the school year 2012/13 are (together absent pupils and not taking an active part in the classes):

- 15% in the classes IV-VI of the primary school (90.7% pupils present, 6.3% passive participation),
- 23% in middle schools (85.9% pupils present, 10% passive participation),
- 30% in secondary schools (80.5% pupils present, 13.3% passive participation).

Those results are visualized in Figure 3.

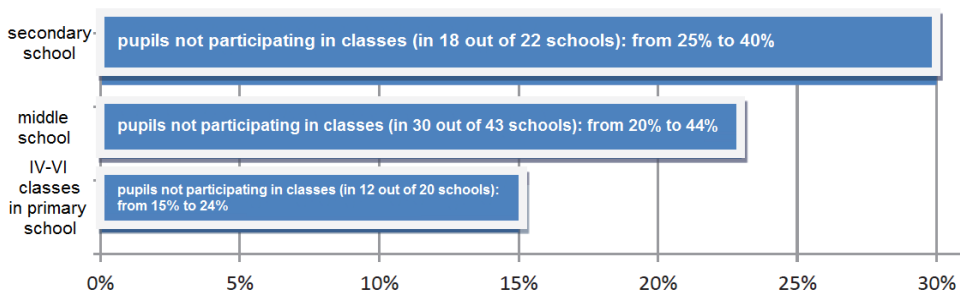


Figure 3. Participation of pupils in the selected week of physical education classes depending on the stage of education

Source: own elaboration based on the audit of the Supreme Audit Office: Wychowanie fizyczne i sport w szkołach publicznych i niepublicznych (nr P/12/067), NIK 2013

Main reasons of a passive participation in the physical education classes, despite presents of these classes, are:

- lack of proper sportswear,
- exemption from the headmaster based on the medical opinion,
- parental note,
- medical certificate.

Graphical form of the summary of reasons of avoiding participation in physical education classes by pupils depending on the stage of education is given in Figure 4.

Permanent exemptions from the physical education classes related with a lack of grade on the school certificate, is possible only on the basis of a certificate issued by a doctor. Such cases were originally meant to be extremely rare. In accordance with modern medical guidelines propagated for example

¹² Ibidem.

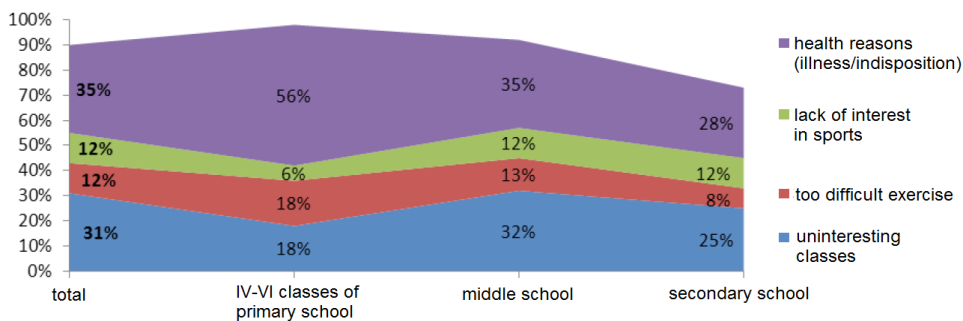


Figure 4. Reasons of avoiding participation in physical education classes by pupils depending on the stage of education

Source: own elaboration based on the audit of the Supreme Audit Office: Wychowanie fizyczne i sport w szkołach publicznych i niepublicznych (nr P/12/067), NIK 2013

by the action “Stop zwolnieniom z WF-u”, pupils with diabetes, first degree lateral curvature of the spine, bronchial asthma, epilepsy or overweight should not be released from physical education classes¹³. Meanwhile statistics are entirely different. According to the Supreme Audit Office (audit for the years 2009/10 – 2011/12) in secondary schools over a dozen percentage of pupils have permanent exemptions from the physical education classes. Detailed statistics are gathered in the Table 1

Table 1

Statistics concerning all-year exemptions from physical education based on medical certificates in school years 2009/10 – 2011/12

SCHOOL YEAR	SCHOOL	STAGE OF EDUCATION		
		PRIMARY	MIDDLE	SECONDARY
2009/10	NON-PUBLIC	3%	6%	16%
	PUBLIC	3%	5%	11%
2010/11	NON-PUBLIC	1%	5%	15%
	PUBLIC	3%	4%	10%
2011/12	NON-PUBLIC	2%	6%	11%
	PUBLIC	2%	5%	11%

Source: own elaboration based on the audit of the Supreme Audit Office: Wychowanie fizyczne i sport w szkołach publicznych i niepublicznych (nr P/12/067), NIK 2013

¹³ Ministry of Sport and Tourism of the Republic of Poland, Stop zwolnieniom z WF-u. Available at: https://www.orlik2012.pl/uploads/MSIT_STOP_zwoleniom_z_WF-u.pdf (Accessed 25 June 2015).

It is an obvious fact that not every medical exemption from physical education is medically justified. Therefore there must be other reasons for pupils to get exemptions from classes. Based on surveys conducted in schools in Poland¹⁴ main reasons are as follows:

- low attractiveness of physical education,
- laziness of modern children and youth,
- lack or low qualifications of teachers to conduct classes,
- lack of sports equipment and sports facilities,
- shame related to own body and appearance (especially for girls),
- bad fit into a school schedule (first/last classes),
- fear that the poor grade from physical education will badly influence the overall grade average.

The goal of this research was to verify the hypothesis about the relation between the achievements in school and getting exemption from the physical education. Achievements were measured by grades of the pupils and for the verification statistical methods were used. Due to availability of data, the results are narrowed only to one middle school. Therefore they cannot be easily generalized for the whole education system in Poland. Nonetheless, according to the authors' knowledge, it is the first attempt of a scientific approach to address this issue.

3. Data characteristics

To verify the hypothesis, expressed by the Ombudsman for Children Marek Michalak in the aforementioned letter to the Minister of National Education, about a strong relationship between assessments of pupils at the physical education and the overall school achievements, the data about the grades of pupils from one of the middle schools were analyzed. In this section the basic characteristics of gathered data are presented.

For the analysis grades of 475 pupils were chosen. Grades were restricted to the following classes: Polish, History, English, Mathematics, Physics, Biology, Geography, Chemistry and Physical Education. Basic descriptive statistics are given in Table 2 and in the form of the boxplots in the Figure 5.

¹⁴ W. Błachno, R. Kozłowski, *Zwolnienia lekarskie, a udział uczniów w obowiązkowych zajęciach wychowania fizycznego w wybranych liceach ogólnokształcących miasta Białystok*, „Roczniki Naukowe Wyższej Szkoły Wychowania Fizycznego i Turystyki w Supraślu” 2007, pp. 100-101.

Table 2

Descriptive statistics of grades from the classes included in the study

Class	Number of data	Min	Median	Mean	Max	Standard deviation
Polish	475	1	3	2.84	6	0.97
History	475	1	3	3.12	6	1.05
English	475	1	3	3.03	5	1.09
Mathematics	475	1	3	2.76	5	1.08
Physics	475	1	3	2.76	5	0.98
Biology	475	1	3	2.89	5	1.04
Geography	475	1	3	2.85	5	1.16
Chemistry	475	1	3	2.97	5	1.06
Physical Education	457	1	4	4.21	6	0.98

Source: own elaboration

In the given sample there were 18 pupils with the permanent exemptions from the physical education classes. This is 3.79% of the total, which does not differ much from the data from the report of the Supreme Audit Office.

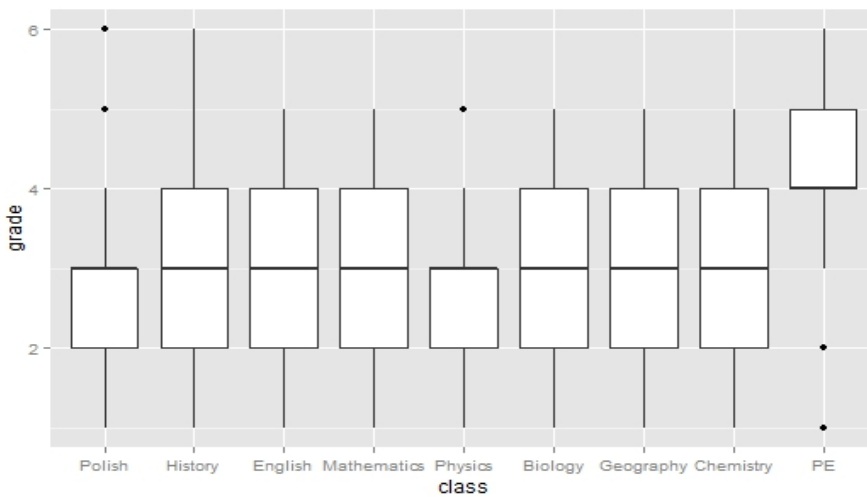


Figure 5. Graphical representation of descriptive statistics of grades from the classes included in the study

Source: own elaboration

To better illustrate the distribution of grades in the research sample, in Figures 6-8 the histograms of grades from respectively the Polish, mathematics and

physical education subjects are presented. It is easily visible (compare means in Table 2) that grades from physical education are much better than those from other classes. Also there are much more the worst grades (one) from mathematics than from Polish. In addition no one got the best possible grade (six) from mathematics. It coincides with the widespread conviction that grades from mathematical sciences are rather worse than from the humanities.

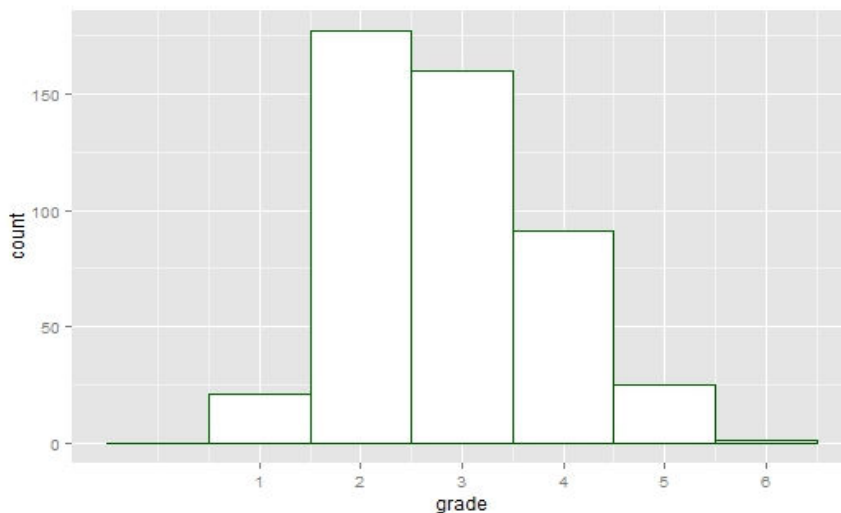


Figure 6. Histogram of grades from the Polish classes

Source: own elaboration

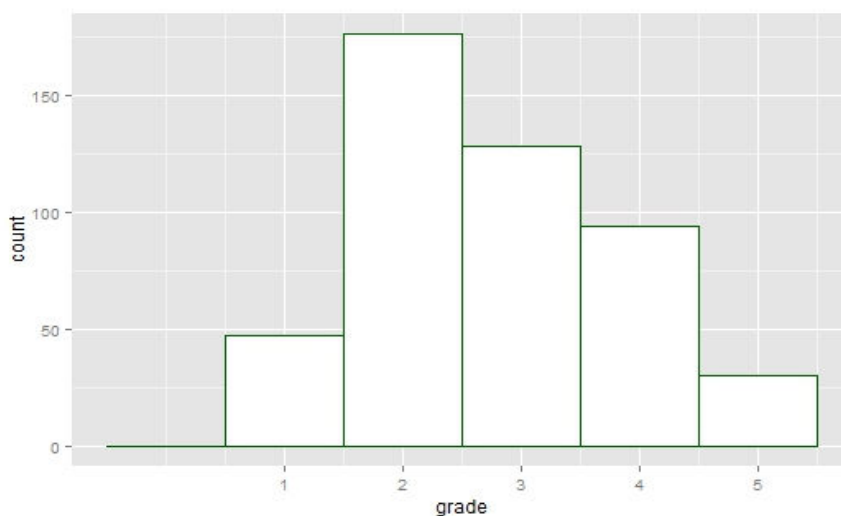


Figure 7. Histogram of grades from the mathematics

Source: own elaboration

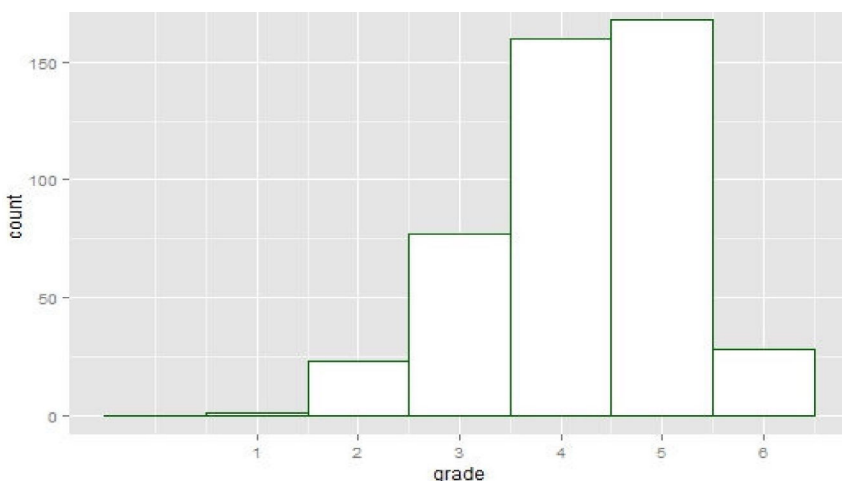


Figure 8. Histogram of grades from the physical education classes
Source: own elaboration

An interesting conclusions could be drawn from the correlation coefficients between grades from the considered subjects. Because grades are the examples of rank (ordinal) variables (in the scale from 1 to 6) the Spearman rho correlation is often choice as a nonparametric measure of statistical dependence between two variables¹⁵. Values of the Spearman rho coefficients are gathered in Table 3. All calculated coefficient proved to be statistically significant (at any reasonable level of significance).

Table 3

Spearman rho correlation coefficients (rounded to two decimal places)
for the grades from the classes included in the study

	Pol.	Hist.	Eng.	Math.	Phys.	Biol.	Geog.	Chem.
Pol.	1.00	0.80	0.70	0.72	0.72	0.70	0.75	0.76
Hist.	0.80	1.00	0.67	0.70	0.73	0.73	0.76	0.76
Eng.	0.70	0.67	1.00	0.72	0.68	0.69	0.71	0.71
Math.	0.72	0.70	0.72	1.00	0.72	0.74	0.75	0.75
Phys.	0.72	0.73	0.68	0.72	1.00	0.68	0.74	0.72
Biol.	0.70	0.73	0.69	0.74	0.68	1.00	0.75	0.70
Geog.	0.75	0.76	0.71	0.75	0.74	0.75	1.00	0.74
Chem.	0.76	0.76	0.71	0.75	0.72	0.70	0.74	1.00

Source: own elaboration

¹⁵ Another common measure is the Kendall's tau rank correlation coefficient. For more information see e.g. G.W. Corder & D.I. Foreman, *Nonparametric Statistics: A Step-by-Step Approach*, Wiley 2014.

Statistically significant correlation between grades from two classes means that pupil, who is better from one subject, statistically gets also better grades from the second subject. Of course coefficients differs from subject to subject. For example it is more likely that pupil, who is good from Polish will also be good from history ($\rho = 0.8$), than good grades from both English and Physics ($\rho = 0.68$).

All presented statistics seems to confirm the correct selection of the sample used in this study.

4. Empirical analysis

The goal of this study was to compare grades of pupils that have medical exemption from physical education with grades of those, who participate in the classes. Based on this comparison the conclusions may be drawn to verify the research hypothesis. Instead of comparison between the corresponding grades, the averages were compared. The histogram of averages of grades from all the subjects except physical education is presented in Figure 9.

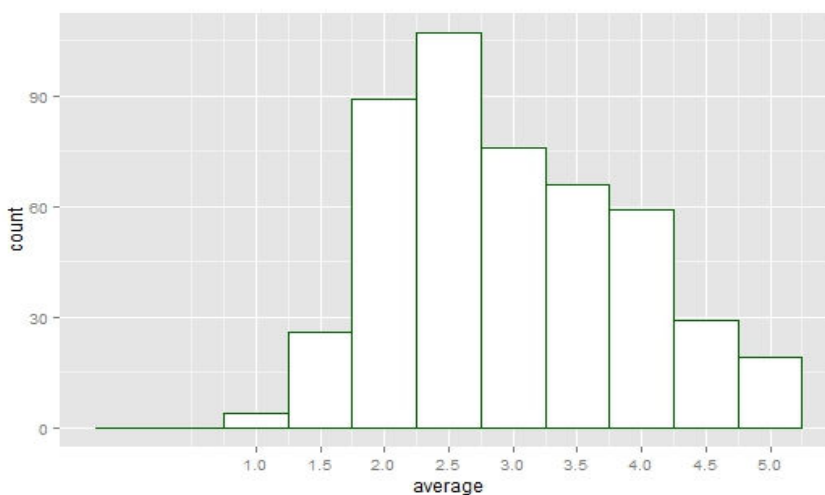


Figure 9. Histogram of averages of grades from all the classes except the physical education

Source: own elaboration

Average grades from classes of pupils who actively participate in physical education classes is equal 2.89 and pupils that have medical exemption 3.11 (for more detailed statistics see Table 4). Such a difference between

averages seems to support the research hypothesis. However a correlation should be calculated and a statistical significance test should be performed to validate the hypothesis.

Table 4

Descriptive statistics of averages from grades from the classes (without physical education) depending whether the pupil has an exemption from physical education classes

Class	Number of data	Min	Median	Mean	Max	Standard deviation
With exemption	18	1.25	3.12	3.11	4.88	1.16
Without exemption	457	1.00	2.75	2.89	5.12	0.91

Source: own elaboration

Verification of the hypothesis is based on two variables. The first variable (average) is quantitative, but the second (with or without exemption) is nominal data with two possible outcomes. Such variables are called dichotomous. To measure a statistical dependence between quantitative and dichotomous variables the point-biserial correlation coefficient may be used. In the considered case calculated point-biserial correlation coefficient turned out to be equal 0.45. Computed p-value = 0.3274 means that there are no reasons to reject the null hypothesis about absence of correlation. Therefore differences proved to be statistically insignificant.

It must be emphasized that one has to be careful with generalization of obtained result to the whole education system. The result should be considered as a preliminary research based on one middle school only. It is very likely that better filtering the data will cause the change of the result. Some reasonable hypothesis about correlation between exemptions from physical education and grades from other subject:

- hypothesis may be true only for secondary schools and/or the last year of middle school; in lower classes pupils and pupils' parents may not attach so much importance to grades,
- hypothesis could be right only for prestigious schools and the group of more ambitious pupils; the study sample definitely should be extended to more than one school,
- other factors can affect the hypothesis, like sex, class profile or attendance rate.

Nevertheless the result from empirical analysis of the test case of one particular school shows that the thesis posed by the Ombudsman for Children Marek Michalak are not necessary true, and certainly not so obvious.

5. Summary

This paper is related to the extremely important topic of young people's health and methods of inculcate the need for physical activity. Available reports by for instance the Supreme Audit Office leave no illusions about the existing and still deteriorating situation in Polish schools. On the other hand a lack of scientific researches is noticeable. These studies could clarify the reasons for the existence of such a situation.

In this paper the description of statistical results from the empirical analysis based on the data about grades of pupils from one middle school. The goal of the analysis was to verify the existence of a correlation between permanent exemptions from the physical education classes and achievements of pupils from other subjects, measured by the overall grade average. The conclusion proved to be different from expected. Based on the given data the hypothesis turned out to be not true. This interesting result is an additional incentive for further, broader research in this area.

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Summary

This article is devoted to the physical education classes within the educational system in Poland. More concretely, one possible reason of taking a medical certificate to qualify a pupil to get permanent exemption from the physical education classes, is being under consideration. Especially the hypothesis that pupils and their parents get false medical certificates in order to get exemption from physical education, and thus improve the overall grade average of a pupil.

In this paper the description of the statistical results from empirical analysis based on the data about grades of pupils from one middle school. The goal of the analysis was to verify the mentioned hypothesis. The result on the analysis was different from expected. Based on the given data the hypothesis turned out to be not true¹⁶. This result should be considered as a preliminary, because it is based on the data from one middle school only. It is very likely that repeating an analysis for the larger and better filtered sample, results would be different. This gives a motivation to further, broader research in this area.

¹⁶ More precise, there are no proves that it is otherwise.