

# The relationship of speech-language disorders by gender in the primary school of the SUVAG Polyclinic to general population data for period from 2013 to 2016 in the Republic of Croatia

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*Source / Izvornik:* **Komunikacija - za bolji jutri : zbornik prispevkov = Communication - for better tomorrow : conference proceedings, 2018, 123 - 128**

**Conference paper / Rad u zborniku**

*Publication status / Verzija rada:* **Published version / Objavljena verzija rada (izdavačev PDF)**

*Permanent link / Trajna poveznica:* <https://urn.nsk.hr/urn:nbn:hr:257:009624>

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*Download date / Datum preuzimanja:* **2024-12-22**



*Repository / Repozitorij:*

[SUVAG Polyclinic Repository](#)





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KOMUNIKACIJA – ZA BOLJŠI JUTRI

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**NASLOV / TITLE**

Zbornik referatov in povzetkov posterjev ter delavnic V. kongresa logopedov Slovenije z mednarodno udeležbo

Conference proceedings and posters' and workshops' abstracts of the V<sup>th</sup> Congress of Slovenian Logopedists with international participation

**IZDAJATELJ / PUBLISHER**

Društvo logopedov Slovenije  
Vinarska ulica 6  
2000 Maribor  
www.dlogs.si

Zavod za gluhe in naglušne Ljubljana  
Vojkova cesta 74  
1000 Ljubljana  
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**OBLIKOVANJE IN GRAFIČNA PRIPRAVA ZA TISK / PREPRESS**

Birografika BORI, d.o.o.

**TISK / PRINT**

Birografika BORI, d.o.o.  
Linhartova 1  
1000 Ljubljana

**NAKLADA / PRINTING**

180 izvodov

Maribor, marec 2018

CIP - Kataložni zapis o publikaciji  
Narodna in univerzitetna knjižnica, Ljubljana

616.89-008.434(082)  
376-056.264(082)

KONGRES logopedov Slovenije z mednarodno udeležbo (5 ; 2018 ; Maribor)  
Komunikacija - za boljši jutri : zbornik prispevkov = Communication - for better tomorrow : conference proceedings / V. kongres logopedov Slovenije, 8.-10. 3. 2018 ; [urednici Mateja Gačnik, Nives Skamlič]. - Maribor : Društvo logopedov Slovenije ; Ljubljana : Zavod za gluhe in naglušne, 2018

ISBN 978-961-94215-3-6 (Zavod za gluhe in naglušne)  
1. Gl. stv. nasl. 2. Vzp. stv. nasl. 3. Gačnik, Mateja  
293830656

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**THE RELATIONSHIP OF SPEECH-LANGUAGE DISORDERS  
BY GENDER IN THE PRIMARY SCHOOL OF THE SUVAG  
POLYCLINIC TO GENERAL POPULATION DATA FOR PERIOD  
FROM 2013 TO 2016 IN THE REPUBLIC OF CROATIA**



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### Abstract

The aim of this paper is to compare the proportion of girls and boys, pupils of the Primary school of the SUVAG Polyclinic that are involved in complex rehabilitation, with general statistical data, i.e. number of pupils in the Republic of Croatia and number of children with speech-language disorders. It was observed whether there are any notable differences in gender distribution. General statistical data pertaining to the entire population of primary school students from the school year 2010/2011 to 2015/2016 were provided in the introductory section. Then, the data pertaining to children with developmental disabilities according to the Croatian Register of Persons with Disabilities with data from the SUVAG Polyclinic were compared.

It is clear from the compared data that the ratio of boys to girls in complex rehabilitation of the school age children is larger than the one at the level of the Republic of Croatia. The trend is clear through 10-year period analyzed.

Since Primary school of the SUVAG Polyclinic and the complex rehabilitation of speech and listening is attended by pupils with higher degree of speech-language disorders, the possible interpretation of the obtained results is that with degree of speech-language difficulty number of boys compared to number of girls increases.

The results obtained can be used to create preventive programs and educations for educators, teachers and expert associates.

**Key words:** speech-language disorders, gender, primary school

### Introduction

Aim of this study was to compare the proportion of girls and boys, pupils of the Primary School of the SUVAG Polyclinic involved in complex rehabilitation, with general statistical data on the proportion of boys and girls with language disorders. Studies in the field of speech-language pathology indicate a significantly more prevalent disorder in boys than in girls. For example, Shriberg, Tomblin and McSweeney (1999) have come up with a number of significant conclusions based on their research as follows: the prevalence of speech delay in children aged 6 years was 3.8%; speech delay was approximately 1.5 times more prevalent in boys (4.5%) compared to girls (3.1%); comorbidity of speech delay and language impairment was 1.3%; approximately 11 to 15% of children with speech delay has later developed specific language impairment. Their discussion encompasses implications of findings for speech-language phenotyping.

In order to better understand the reasons for the higher incidence of speech-language disorders in boys compared to girls, we also observed gender differences in general knowledge achievement. We started from existing knowledge that girls are more successful than boys in different areas of school achievement (Davis, 2000; Burušić and Šerić,



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2015). Also, research focused on specific areas shows that girls have better school achievement in maternal and foreign languages, and reading and writing (Allred, 1990; Gurian et al., 2011; Meece et al., 2006).

Calvin et al. (2010) surveyed 11-year-olds ( $M = 133.5$  months,  $SD = 3.5$ ), by analyzing the correlations between general or specific cognitive abilities, sex and educational achievements in 178,599 pupils (89,545 girls and 89,054 boys) attending English state schools. Cognitive abilities, including verbal, quantitative and nonverbal reasoning abilities, were examined in all children. Those abilities were linked to each child's results on national tests in English, mathematics and science. There was significant gender difference in achievement. On verbal tasks, girls achieved 26% SD higher score than boys, and boys achieved 28% SD higher score than girls on quantitative tasks, while there was negligible gender difference in nonverbal reasoning abilities (1% SD). In mathematics and science there were less apparent differences than in English, where girls achieved better results. Baron-Cohen (2005), in his writing on the differences between boys and girls points out that earlier studies of sex differences in psychological aspects has focused on what is sometimes called "the holy trinity" which includes spatial ability, mathematical ability and verbal ability. The first two of these are areas where boys are more successful at a higher level, and in the latter girls usually show advantage. Baron-Cohen (2005) further points out that in girls, along with verbal ability, stronger empathy is also present. More empathy and good verbal skills facilitate communication, so both abilities could be related and confirm a new theory that claims that the female brain is more strongly focused on empathy, and male brain is largely more focused on understanding and system building. Previous research that shows that boys are usually better in spatial tasks (Crucian and Berenbaum, 1998) and have higher numerical abilities (Calvin et al., 2010), while girls achieve better results in verbal abilities

tasks (Baron-Cohen, 2005) suggest that in the population of children without speech-language disorders girls have better achievement in tasks that require developed speech-language abilities.

Rutter et al. (2004) conducted a detailed analysis of four epidemiological studies and concluded that specific reading disorders were significantly more frequent in boys than in girls. Research of different reading comprehension factors can contribute to understanding of these factors, and can serve in planning of gender-oriented programs for literacy development (Kolić-Vehovec et al., 2009). Girls comprehend narrative text better than boys do while there is no difference in expository text comprehension. The results of a research conducted in Croatia and Slovenia in fourth grade pupils (Kolić-Vehovec et al., 2009) also point to better comprehension in girls, but also to the importance of motivation for reading comprehension in boys, especially if text in question is narrative (Kolić-Vehovec et al., 2009).

In this paper, we started from the hypothesis that boys to girls ratio is higher in accordance with intensity of speech-language pathology, that is, it depends on the type and degree of hearing, speech-language and communication disorder. This research was motivated by multiannual monitoring of the number of boys and girls, patients, i.e. pupils of the Primary School of the SUVAG Polyclinic from which it is apparent that number of girls decreases, while the number of boys increases. The criterion for inclusion in complex rehabilitation within the Primary School of the SUVAG Polyclinic is the existence of larger speech-language communication disorders. The general data from the Croatian Register of Persons with Disabilities was used as a framework for comparison, and its data shows that on January 26, 2017 out of 511,910 persons with disabilities, 32,101 are children younger than 18. That is 6.2% of the total number of persons with disabilities. In the total number of children with disabilities and larger developmental disabilities, a larger number of boys (62%) than girls (38%) has been identified.



The largest number of registered, 14,969 (46.6%) is in the age group from 10 to 14 years. Health indicators show that speech-language communication disorders, central nervous system impairments and intellectual impairments are the most common causes of disability or comorbid diagnosis that contribute to child's developmental disabilities.

## Method

A retrograde study was carried out, analyzing data from The Statistical Yearbook of the Republic of Croatia for 2016 of the Croatian Bureau of Statistics, the data of the Croatian Institute of Public Health

contained in the Report on Persons with Disabilities in the Republic of Croatia, and data from the annual reports on the work of the Primary School of the SUVAG Polyclinic. Data analysis was carried out using descriptive statistics by calculating the proportion of boys and girls in each source of data for each year.

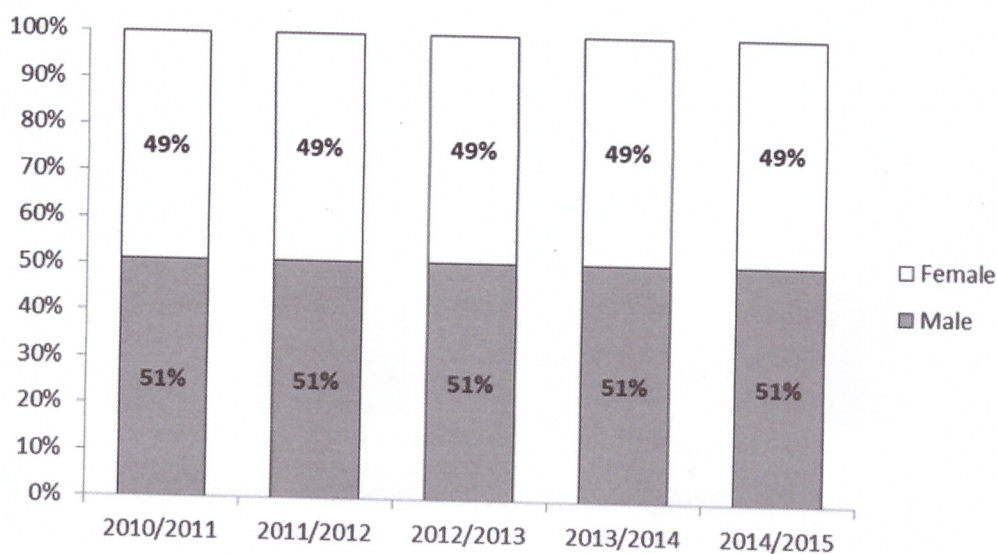
## Results

Table 1 shows that in the observed period, the total number of pupils in the general population of children, elementary school students in the Republic of Croatia, is decreasing, but the ratio of

**Table 1.** Data on the number of boys and girls in the general population of the primary school children in the Republic of Croatia (The Statistical Yearbook, 2016)

School year	Male		Female	
	n	%	n	%
2010/2011	179,184	51%	170,076	49%
2011/2012	174,253	51%	165,130	49%
2012/2013	170,167	51%	161,524	49%
2013/2014	167,120	51%	158,175	49%
2014/2015	164,872	51%	156,433	49%

**Figure 1.** Proportion of boys and girls in the general population of the primary school children in the Republic of Croatia in each school year





boys and girls is stable, with the number of boys slightly higher.

Table 2 shows the number of boys and girls with speech-language communication disorder between the ages of 0 and 18, taken from the Report on Persons with Disabilities in the Republic of Croatia of the Croatian Institute of Public Health (The Report on Persons with Disabilities. Zagreb: Hrvatski zavod za javno zdravstvo; 2014; The Report on Persons with Disabilities. Zagreb: Hrvatski zavod za javno zdravstvo; 2015; The Report on Persons with Disabilities. Zagreb: Hrvatski zavod za javno zdravstvo; 2016; The Report on Persons with Disabilities. Zagreb: Hrvatski zavod za javno zdravstvo; 2017).

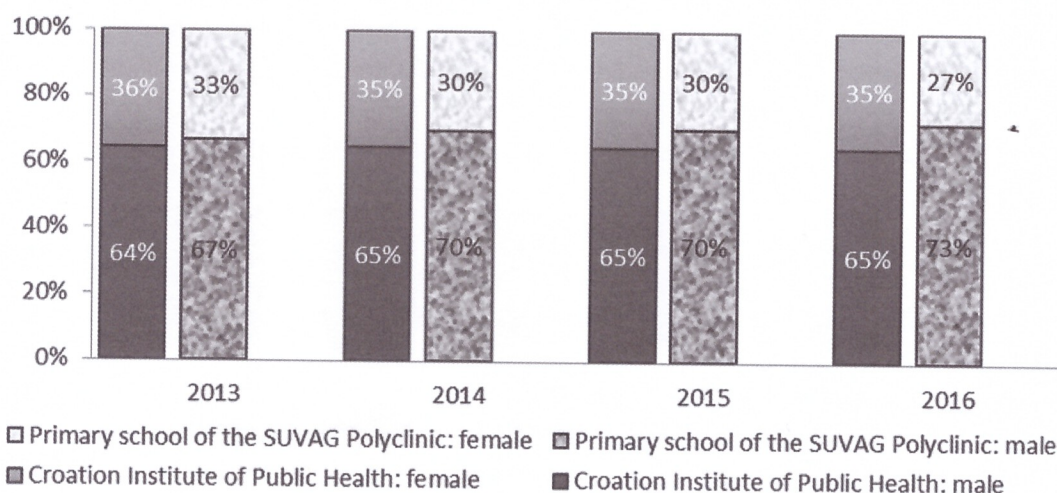
It also shows the number of boys and girls that attended the Primary school of the SUVAG Polyclinic in the observed period.

The ratio of boys to girls, according to each source, is also shown in Figure 2. It can be seen that according to the data of the Croatian Institute for Public Health the ratio of boys and girls in the observed period is rather stable and that the proportion of boys is higher than the proportion of girls. In the group of children who attended Primary School of the SUVAG Polyclinic, the proportion of boys is also higher than the proportion of girls, but the ratio is more pronounced in favor of boys, i.e. the proportion of boys in the SUVAG Polyclinic is higher than that present in the data of the Croatian Institute for Public Health.

**Table 2.** Number of boys and girls with speech-language communication disorder in the ages from 0 to 18 (Croatian Institute for Public Health), and number of boys and girls in the Primary School of the SUVAG Polyclinic

Year	Croatian Institute for Public Health				Primary school of the SUVAG Polyclinic			
	Male		Female		Male		Female	
	n	%	n	%	N	%	n	%
2013	6434	64	3548	36	146	67	73	33
2014	7904	65	4278	35	154	70	67	30
2015	8512	65	4590	35	155	70	65	30
2016	7829	65	4249	35	153	73	58	27

**Figure 2.** Proportion of boys and girls with speech-language communication disorder in the ages from 0 to 18 (Croatian Institute for Public Health), and proportion of boys and girls in the Primary School of the SUVAG Polyclinic





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## Conclusion

It is clear from the data compared that there are more boys and fewer girls in the complex rehabilitation of school-age children compared to students with speech-language disorders at the level of the Republic of Croatia. Complex rehabilitation of children with more pronounced speech-language disorders is implemented in the Primary School of the SUVAG Polyclinic. Inclusion criteria are significant deviations (more than 2SD) on at least two standardized tests that measure speech-language abilities. These criteria include complete diagnostic process that is consisted of speech pathology and psychological diagnostic instruments. Given the above criteria, it can be concluded that the ratio of boys to girls in the Primary school of the SUVAG Polyclinic that favors boys is a consequence of clinically more pronounced symptoms of speech-

language disorder in boys, which is why they are more often referred to this aspect of rehabilitation. The study that we performed certainly implies the need for future research that would clarify the rates of intensity of expression of the clinical symptoms of speech-language disorders in boys and girls, which could result in an increased proportion of boys compared to girls in specialized institutions such as the SUVAG Polyclinic.

Given the indicators of the differences in the functioning of boys and girls in the population of children without speech-language disorders mentioned in the introductory section of this study, and the greater number of boys involved in rehabilitation within specialized rehabilitation institutions, it is necessary to consider these gender-specific differences in achievements and ways of acquiring knowledge from different areas in the creation of rehabilitation optimals.

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