**Abstract**

The aim of this study was to determine characteristics of phonological awareness of stuttering children and children with fluent speech. The sample consisted of 64 children, between 56 and 83 months old (4 years and 8 months to 6 years and 11 months). Examinees were divided in two groups. The first group consisted of 32 stuttering children, 19 males, and 13 females. The control group consisted of 32 children with fluent speech, whose age and sex were equal to the age and sex of the children in the experimental group. The research was conducted in preschools and primary schools in Tuzla and Una-Sana Canton in Bosnia and Herzegovina. The subjects were examined with 7 subtests (syllable and phoneme blending abilities, ability to rhyme, phoneme segmentation, phoneme deletion, phoneme transposition and spoonerisms). Each of the subtest scores, which index a variety of phonological awareness abilities, was examined separately. Phonological awareness score is the total score which relates to a common result that the subjects achieved on these 7 individual subtests. The results showed that there were no statistically significant differences between stuttering...
and the phonological analysis of children who stutter and children with fluent speech in relation to Phonological awareness score. The examination of differences between stuttering and non-stuttering children in individual variables, which describe phonological awareness, showed that there was statistically significant difference in the ability to rhyme between these two subjects groups. T-test was used for examination of the differences between the male stuttering children and their fluent peers, and also female stuttering children and their fluent peers for the phonological awareness variables. The results exhibited statistically significant differences in the variable Rhyme between the male stuttering children and their fluent peers. In addition, we examined the ability of phonemic analysis of children who stutter and children with fluent speech. The results showed that there were not statistically significant differences between stuttering and non-stuttering children related to phonemic analysis abilities.

Keywords: stuttering children, children with fluent speech, phonological awareness development

Introduction

Stuttering is a disorder which affects speech fluency. It occurs during the contraction of vocal organs. Normal rhythm and speed of speech are lost, so the speech itself ceases to be fluent (1). Stuttering is a speech disorder in which sounds, syllables, or words are repeated or prolonged, disrupting the normal flow of speech. These speech disruptions may be accompanied by struggling behaviors, such as rapid eye blinks or tremors of the lips (2). Many factors, children’s inner factors, or environmental factors, may act as triggers for the onset of stuttering in some individuals, and then, later on, to affect the stuttering progress. It seems that some of these factors are part of normal children’s development, such as the rapid growth and development of speech and language skills during the preschool period (3). Phonology is the aspect of language concerned with the rules governing the structure, distribution and sequencing or speech sounds and the shape of syllables (4). The phonological...
Phonological awareness is metalinguistic knowledge of language sound structure, in other words, awareness of phonological structure of words, phrases and sentences. It includes understanding of different ways of dividing a certain language into smaller segments, which are at the same time interrelated and which can be manipulated with. Phonological awareness is a skill which implies observing abilities, manipulation and consideration of speech sounds, in order to make fluent speech (6). It is awareness of voice structure and it is demonstrated through ability to rhyme or segmenting multiple words into syllables (3). Acquisition and application of phonological awareness is affected by cognitive abilities, long-term verbal memory and language understanding. A child, first, needs to understand a certain part of speech, then to retain it in memory in order to perform the ability of phonological awareness, and in the end to perform it in speech. Extraction of the first or the last sound requires noticing individual sounds in a word, matching their position, sound recognition in certain position, extraction of certain sound, and its retention in memory (7). Many authors have reported that children who stutter are far more likely to have a phonological disorder than their peers who do not stutter (8, 9). In the profession of speech-language pathology, there is a strong belief that phonological disorders frequently occur in children who stutter. The current review indicates that frequency rates vary widely from one study to another, making it difficult to state with confidence just how often the two disorders co-occur (10). Recent theories (according to Eldridge, 2006) suggest that speech disfluencies result from a disruption in the time-dependent processes of phonological and phonetic encoding (11). Speech is the easiest to disrupt during the time when the speech is not completely automated (1). Clinical observation and researches suggest that stuttering occurs more often in situations when children use more advanced forms of language and speech. Experimental researches show that both stuttering and non-stuttering children became more non-fluent as language complexity increases (3). Stuttering tends to
на јазикот (3). Пелтењето се манифестира кога децата почуваат да ги поврзуваат зборовите во реченици или кога почуваат да составуваат покомплексни изрази, обично на возраст меѓу 30 и 36 месеци (9). Главната цел на ова истражување беше да ги одреди карактеристиките на фонолошката свест на деца што пелтеат и деца што не пелтеат.

Методологија

Во истражувањето беа вклучени 64 деца на возраст меѓу 56 и 83 месеци (од 4 години и 8 месеци до 6 години и 11 месеци). Тие беа поделени во две групи. Првата група се состоеше од 32 деца што пелтеат, 19 момчиња и 13 девојчиња (експериментална група). Контролната група беше основана според експерименталната и вклучуваше ист број деца што зборуваат течно, чиј пол и години беа еднакви со полот и годините на учесниците во експериментална група.

Анамнестички варијабли:
1. Група на субјекти (група): деца што пелтеат (Stuttering children [SC]); деца што зборуваат течно (Children with fluent speech [FC])
2. Пол на детето: мажки (M); женски (Ж)

Варијабли за испитување на фонолошката свест
1. Поврзување слогови (ПС)
2. Поврзување фонеми (ПФ)
3. Римување (Р)
4. Сегментација на фонеми (СФ)
5. Испуштање на фонеми (ИФ)
6. Транспозиција на фонеми (ТФ)
7. Замена на слогови (ЗС)
8. Резултат за фонолошката свест (РФС)
9. Класификација на фонолошката свест (КФС) (многу ниска - 1; ниска - 2; потпростична - 3; простична - 4; високо простична - 5; висока - 6; многу висока - 7)
10. Аналiza на фонеми - скала на резултати (АФ-СР)
11. Аналiza на фонеми – дескриптивни термини (АФ - ДТ) (многу слаба - 1; слаба - 2; потпростична - 3; простична - 4; натпростична - 5; супериорна - 6; многу супериорна - 7).

manifest itself when children begin to string words together to produce sentences or when they begin to produce more complex utterances, typically beginning between the ages of 30 and 36 months (9). The main goal of this research was to determine characteristics of phonological awareness of stuttering and non-stuttering children.

Methodology

The research included 64 children between 56 to 83 months (from 4 years and 8 months to 6 years and 11 months). They were divided into two groups. The first group consisted of 32 stuttering children, 19 males, and 13 females (experimental group). The control group was based on the experimental group and it included the same number of children with fluent speech, whose sex and age were equal to age and sex of participants in experimental group.

Variables

1. Syllable blending (SB)
2. Phoneme blending (PB)
3. Rhyme (RHY)
4. Phoneme segmentation (PS)
5. Phoneme deletion (PD)
6. Phoneme transposition (PT)
7. Spoonerisms (SPOON)
8. Phonological awareness score (PAS)
9. Phonological awareness classification (PAC) (very low - 1; low - 2; low average - 3; average - 4; high average - 5; high - 6; very high - 7)
10. Phonemic analysis-Scaled scores (PA-SS)
11. Phonemic analysis- Descriptive terms (PA-DT) (very poor - 1, poor - 2, below average - 3, average - 4, above average - 5, superior - 6, very superior - 7).
Варијаблатите поврзување слогови (ПС) беше испитана така што испитаникот, откако ќе го слушне изговоренит збор, поделен на слогови од страна на испитувачот, треба да ги поврзне изговорените слогови и да го изговори целниот збор (пр. /vra/-/ta/, испитаникот треба да каже /vrat/a/).

Варијаблатите поврзување фонеми (ПФ) беше испитана така што испитувачот изговара одредени кратки гласови, а испитаникот треба да ги поврзе во збор (пр. /k/-/y/-/č/-/e/ испитаникот треба да каже /kуче/).

Варијаблатата рима беше испитана така што на испитаникот му се понудени три збора, од кои два се римуваат, а еден не. Испитаникот треба да каже кој збор се разликува — не се римува (пр. /mаче/-/седи/-/колаче/ испитаникот треба да каже /седи/).

Варијаблатата сегментација на фонеми (СФ) беше испитана така што испитувачот го изговара целниот збор, а испитаникот треба да го раздели зборот на фонеми (пр. /мilenik/ испитаникот треба да каже /m/-/i/-/l/-/e/-/n/-/i/-/k/).

Варијаблатата испитување на фонеми (ИФ) беше испитана така што испитаникот треба да го повтори зборот што го казал испитувачот така што ќе испусти одреден глас (пр. /посп/ без /n/, испитаникот треба да каже /осп/).

Варијаблатата транспозиција на фонеми (ТФ) беше испитана така што испитувачот го кажува зборот како одделни гласови додека испитаникот треба да го замени и каже /посп/.

Варијаблатата замена на слогови (ЗС) беше испитана така што испитувачот кажува два збора, еден по друг, испитаникот треба да ги замени местата на почетните гласови и да каже два нови збора (на пример /бег/-/физ/, испитаникот треба да каже /физ/-/бег/).

Резултат за фонолошка свест (РФС) претставува резултат добиен од споменатите варијабли за испитување на фонолошката свест. За секој точен одговор во сите варијабли, испитаникот добива еден поен. Минимум резултатот е 0, а максимум е 6 поени за секоја варијабла. Зајакени ги предвид сите варијабли, максимален број поени што може учесникот да ги постигне е 42.

Варијаблатата класификација на фонолошката Variable Syllable blending (SB) was examined in a way that the respondent, after hearing the spoken word, divorced into syllables by the examiner, should link the spoken syllables and pronounce the word as a whole (e.g. /win/-/dow/ respondent should say /window/). Variable Phoneme blending (PB) was examined in the way that the examiner pronounced some short sounds, and the respondent was supposed to make them into whole word (e.g. /d/-/o/-/g/ respondent should say /dog/).

Variable Rhyme (RHY) was examined in a way that the respondent was offered three words, two of which rhyme, and one does not. The respondent should say which word sounds most different – does not rhyme (e.g. /dog/-/pot/-/log/ respondent should say /pot/).

Variable Phoneme segmentation (PS) was examined in a way that the examiner pronounced the whole word, and the respondent’s task was to divorce the spoken word into phonemes (e.g. /pet/ respondent should say /p/-/e/-/t/).

Variable Phoneme deletion (PD) was examined in a way that the respondent should repeat the word that the examiner uttered before, but with one specific sound missing (e.g. /cup/ without /c/respondent should say /up/).

Variable Phoneme transposition (PT) was examined in a way that the examiner said the word as separate sounds, while the respondent should say the word by connecting sounds backwards (e.g. /net/ respondent should say /ten/).

Variable Spoonerisms (SPOON) was examined in a way that the examiner uttered two words, one after another, and the respondent should change the beginning sounds round, and say two new words (e.g. /red jug/ respondent should say /red jug/).

Phonological awareness score (PAS) was examined in a way that the examiner uttered two words, one after another, and the respondent should change the beginning sounds round, and say two new words (e.g. /red jug/ respondent should say /red jug/).

Phonological awareness score (PAS) represents the sum of the mentioned variables for the examination of the phonological awareness. For each correct answer in all of those variables, the respondent received the one point. Minimum score was 0 and the maximum score is totalled 6 points for each variable. Taking into consideration all of these variables, the maximum score that a participant could achieve as a PAS was 42 points.
Variable Phonological awareness classification (PAC) represents the descriptive assessment of Phonological awareness score (PAS). Descriptive terms for phonological awareness were: very low, low, low average, average, high average, high and very high phonological awareness.

Variable Phonemic analysis - Scaled scores (PA-SS) measured the ability to divide words into smaller phonemic units (e.g. the examiner says, say “apartment”. Now say it again, but do not say “ment”). For each correct answer, the respondent was given 1 point. Maximum score was 22 points.

Methods

The research was conducted in preschools and primary schools in Tuzla and Una-Sana Canton in Bosnia and Herzegovina. Each subject was treated separately. The test of Phonological Awareness (2008) contained seven subtests which are tested individually (12). These tests were used to examine syllable and phoneme blending abilities, ability to rhyme, phoneme segmentation, phoneme deletion, phoneme transposition and spoonerisms. Each subtest contained 6 items to examine. The phonological awareness score is the total score obtained on the Test of Phonological Awareness (12), and each of the subtest scores, which index a variety of phonological awareness abilities, were examined separately. The highest achievable score in Phonological awareness test (12) was 42 points. Based on their results, subjects could be placed in one of the categories of phonological awareness classification: very poor, poor, below average, average, above average, superior and very superior.

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Methods
дека детето може да биде подготовено да го дава очекуваниот одговор користејќи интонација, акцент, интензитет, правење пауза прет зборот или со говорот на телото, како, на пример, контакт со очи, беше направен напор да се избегнат сите овие елементи на тој начин што сите задачи беа презетирани рамномерно, подеднакво, без паузи. Во случај кога детето ќе го замолеше испитувачот да јa повтори задачата, имаше право на тоа само еднаш, а потоа му беше објаснето дека трева да слуша повнимателно, затоа што сите зборови/гласови можат да се повторат само еднаш. За секоја задача времето беше ограничено на 10 секунди. Со цел да се спречи децата да прават непотребни грешки, тестирањето беше прекинува но ако детето направи 8 последователни грешки (12). Потсетот анализа на фонемите беше користен за да се испита фонолошката способност. Беше земен од Тестот за развој на јазикот TOLD-P:4 (2008) (13), кој користи 22 задачи за да јa измери способноста за разделивање зборови на помали фонемски единици. Дескриптивните точки поврзани со развојот на анализа на фонемите беа опишани како: многу слаба - 1, слаба - 2, потпросечна - 3, просечна - 4, натпросечна - 5, суперпросечна - 6, многу суперпросечна - 7. Од испитувачите се очекуваше да ги изговараат задачите ясно, без нагласување на гласовите (13).

Статистичка обработка на податоци
За статистичка обработка на податочите беше користен компјутерски статистички пакет SPSS 15.0. Статистички значајната прифатливост беше р < 0,05. Основните статистички параметри беа пресметувани за секоја варијабла: аритметичка средина, стандардно отстапување, минимално, максимално. Тестот беше користен за испитување на разликите во анализираниот варијабли кај деца што пелтечат и деца што зборуваат течно.

Резултати
Примерокот во ова истражување се состоеше од 64 деца на возраст меѓу 56 и 83 месеци, 32 беа деца што пелтечат, а останатите 32 беа деца што зборуваат течно. The fact that a child could be prepared to give expected answer by using intonation, stress, intensity, making pauses before words or using body language in terms of eye contact, an effort was putted to avoid all of these interfering elements in a way that all tasks were presented smoothly, equally without pauses. In cases when a child asked the examiner to repeat the task, it would be enabled once, after that it was explained that they would have to listen more carefully, because all words/sounds may be repeated only once. Time limit for every task was 10 seconds. In order to prevent children from making unnecessary mistakes, the testing was stopped in cases when a child made 8 mistakes in a row (12). Subtest Phonemic analysis was used to examine phonology ability. It was taken from Test of language development TOLD-P: 4 (2008) (13), which used 22 tasks to measure ability to separate words in smaller phonemic units. The descriptive items related to phonemic analysis development were described as: very poor-1, poor-2, below average-3, average-4, above average-5, superior-6, and very superior-7. Examiners were expected to pronounce tasks clearly without emphasizing sounds (13).

Statistic data processing
Statistical computer package SPSS 15.0 was used for statistical data processing. The statistical significance acceptance was р <0.05. Basic statistic parameters were calculated for each variable: arithmetic mean, standard deviation, minimal and maximal. For examination of differences in analysed variables between stuttering children and children with fluent speech was used T- test.

Results
The sample of subjects in this research consisted of 64 children between 56 to 83 months, 32 subjects were stuttering children, and other 32 subjects were children with fluent speech.
Табела 1. Дескриптивна статистика на варијаблите, кои описуваат фонолошката свест и анализата на фонеми по субјектите

<table>
<thead>
<tr>
<th>Варијаблите / Variables</th>
<th>Деца што пелтечат / Stuttering children (SC)</th>
<th>Деца што зборуваат течно / Children with fluent speech (FC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{x}$</td>
<td>CO / SD</td>
</tr>
<tr>
<td>РС / PAS</td>
<td>23,00</td>
<td>8,565</td>
</tr>
<tr>
<td>КФС / PAC</td>
<td>5,44</td>
<td>1,366</td>
</tr>
<tr>
<td>ПС / SB</td>
<td>5,56</td>
<td>1,162</td>
</tr>
<tr>
<td>ПФ / PB</td>
<td>4,41</td>
<td>2,168</td>
</tr>
<tr>
<td>П / RHY</td>
<td>3,09</td>
<td>0,928</td>
</tr>
<tr>
<td>Ф / PS</td>
<td>3,81</td>
<td>2,442</td>
</tr>
<tr>
<td>ИФ / PD</td>
<td>2,22</td>
<td>1,560</td>
</tr>
<tr>
<td>ГФ / PT</td>
<td>3,53</td>
<td>1,883</td>
</tr>
<tr>
<td>С / SPOON</td>
<td>0,38</td>
<td>0,554</td>
</tr>
<tr>
<td>АФ-СР / PA-SS</td>
<td>9,66</td>
<td>2,585</td>
</tr>
<tr>
<td>АФ - ДГ / PA-DT</td>
<td>3,84</td>
<td>0,767</td>
</tr>
</tbody>
</table>

Табелата 1 ги покажува результатите од дескриптивната статистика на варијаблите, кои описуваат фонолошката свест и фонетската анализа на децата што пелтечат и децата што не пелтечат. Средната вредност за варијаблата резултат на фонолошката свест коеа што пелтечат беше 23 поени, со стандардно отстапување од 8,565, додека истата варијабла коеа што не пелтечат беше 24,91 поени, со стандардно отстапување од 8,026 поени. Земајќи на предвид фонолошката свест која се рангира од многу ниска до многу висока, децата што пелтечат постигнаа високо просечни и високи резултати, а децата што не пелтечат постигнаа високи резултати на тестот на фонолошка свест.

Средната вредност за варијаблата анализи на фонеми – скала на резултати (АФ – СР) коеа што пелтечат беше 9,66, со стандардно отстапување од 2,585 поени. Средната вредност на истата варијабла коеа што не пелтечат беше 10,75 поени, со стандардно отстапување од 2,527 поени. Кога ги пресметавме поените во однос на дескриптивните термини, можеме да заклучиме дека и двете групи покажуваат просечно ниво на фонемска анализа.

Table 1. Displays the results of the descriptive statistics of variables, which describe phonological awareness and phonemic analysis in all subjects.

Table 1. Descriptive statistics of variables, which describe phonological awareness and phonemic analysis.

The mean value of the variable Phonological awareness score (PAS) of stuttering subjects was 23 points, with standard deviation 8,565 while the same variable for non-stuttering children was 24,91 points, with standard deviation 8,026 points. Taking into consideration the descriptive notion of phonological awareness which ranged from very low to very high, stuttering children scored between high-average and high, while non-stuttering children scored high in Phonological awareness test.

The mean value of the variable Phonemic analysis- Scaled scores (PA-SS) in stuttering children was 9,66, with standard deviation 2,585 points. The mean value of the same variable in non-stuttering children was 10,75 points, with standard deviation 2,527 points. When we obtained the points into a descriptive term, we can conclude that both subject groups showed average level of phonemic analysis.
**Table 2.** T-test for variable Phonological awareness score and individual variables, which describe the phonological awareness among stuttering children and children with fluent speech

<table>
<thead>
<tr>
<th>Variable / Variables</th>
<th>Phonological awareness score of stuttering children (FC)</th>
<th>Phonological awareness score of children with fluent speech (FC)</th>
<th>df</th>
<th>t-test</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>РФС / PAS</td>
<td>23.0, 8.565</td>
<td>24.91, 8.026</td>
<td>62</td>
<td>-0.919</td>
<td>0.362</td>
</tr>
<tr>
<td>ИС / SB</td>
<td>5.56, 1.162</td>
<td>5.84, 0.628</td>
<td>62</td>
<td>-1.204</td>
<td>0.233</td>
</tr>
<tr>
<td>ИФ / PB</td>
<td>4.41, 2.168</td>
<td>4.28, 2.303</td>
<td>62</td>
<td>0.224</td>
<td>0.824</td>
</tr>
<tr>
<td>Р / RHY</td>
<td>3.09, 0.928</td>
<td>3.63, 0.751</td>
<td>62</td>
<td>-2.516</td>
<td>0.014*</td>
</tr>
<tr>
<td>РФ / PS</td>
<td>3.81, 2.442</td>
<td>4.16, 2.503</td>
<td>62</td>
<td>-0.556</td>
<td>0.580</td>
</tr>
<tr>
<td>ИФ / PD</td>
<td>2.22, 1.560</td>
<td>2.59, 1.811</td>
<td>62</td>
<td>-0.887</td>
<td>0.378</td>
</tr>
<tr>
<td>ГФ / PT</td>
<td>3.53, 1.883</td>
<td>4.03, 2.163</td>
<td>62</td>
<td>-0.986</td>
<td>0.328</td>
</tr>
<tr>
<td>РС / SPOON</td>
<td>0.38, 0.554</td>
<td>0.38, 0.554</td>
<td>62</td>
<td>0.000</td>
<td>1.000</td>
</tr>
</tbody>
</table>

T-test was used to examine differences between subject groups in phonological awareness abilities. Table 2 displays the differences between the total score of phonological awareness and the individual variables, which describe the phonological awareness in stuttering and non-stuttering children. During the analysis between variables examining phonological awareness, statistically significant difference appeared in relation to the results related to variable Rhyme (RHY), probability for which was 0.014. In other words, stuttering children showed statistically low abilities in rhyme recognition between words, as opposed to non-stuttering children.

**Table 3.** Differences between male subjects of both subjects group in relation to the variable Phonological awareness score and individual variables, which describe phonological awareness

<table>
<thead>
<tr>
<th>Variable / Variables</th>
<th>Phonological awareness score of male stuttering children (ДЗТ / FC)</th>
<th>Phonological awareness score of male children with fluent speech (ДЗТ / FC)</th>
<th>df</th>
<th>t-test</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>РФС / PAS</td>
<td>21.37, 9.251</td>
<td>24.26, 8.102</td>
<td>36</td>
<td>-1.026</td>
<td>0.312</td>
</tr>
<tr>
<td>ИС / SB</td>
<td>5.58, 1.305</td>
<td>5.74, 0.806</td>
<td>36</td>
<td>-0.449</td>
<td>0.656</td>
</tr>
<tr>
<td>ИФ / PB</td>
<td>3.95, 2.505</td>
<td>4.26, 2.207</td>
<td>36</td>
<td>-0.412</td>
<td>0.683</td>
</tr>
<tr>
<td>Р / RHY</td>
<td>2.74, 0.806</td>
<td>3.58, 0.838</td>
<td>36</td>
<td>-3.158</td>
<td>0.003*</td>
</tr>
<tr>
<td>РФ / PS</td>
<td>3.37, 2.629</td>
<td>4.05, 2.438</td>
<td>36</td>
<td>-0.832</td>
<td>0.411</td>
</tr>
<tr>
<td>ИФ / PD</td>
<td>2.21, 1.718</td>
<td>2.21, 1.584</td>
<td>36</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>ГФ / PT</td>
<td>3.26, 1.939</td>
<td>4.05, 2.248</td>
<td>36</td>
<td>-1.159</td>
<td>0.254</td>
</tr>
<tr>
<td>ИС / SPOON</td>
<td>0.26, 0.452</td>
<td>0.37, 0.496</td>
<td>36</td>
<td>-0.684</td>
<td>0.499</td>
</tr>
</tbody>
</table>
Резултатите од испитувањето на разликуте во анализираната варијабла резултат за фонолошка свест мегу момчиња што пелтечат и нивните врсници што зборуваат течно, покаја дека не постои статистички значајна разлика мегу субјектите. Но, во индивидуалните варијабли што ја општуваат фонолошката свест мегу момчиња што пелтечат и момчиња што зборуваат течно, откривме дека постои значајна разлика мегу субјектите во варијаблата рима (табела 3).

Табела 4. Разлики мегу девојчиња од две групи субјекти за варијаблата резултат на фонолошка свест и индивидуални варијабли што ја општуваат фонолошката свест.

<table>
<thead>
<tr>
<th>Варијабли / Variables</th>
<th>Девојчиња / Female (Д / F) - девојчиња што пелтечат / Stuttering children (ДП / SC)</th>
<th>Девојчиња / Female (Д / F) - девојчиња што зборуваат течно / Children with fluent speech (ДЗТ / FC)</th>
<th>Df</th>
<th>t-test</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>РС / PAS fracking score</td>
<td>25,38</td>
<td>7,124</td>
<td>25,85</td>
<td>8,143</td>
<td>24</td>
</tr>
<tr>
<td>ПС / SB phonological awareness score</td>
<td>5,54</td>
<td>0,967</td>
<td>6,00</td>
<td>0,000</td>
<td>24</td>
</tr>
<tr>
<td>ФФ / PB rhyming score</td>
<td>5,08</td>
<td>1,382</td>
<td>4,31</td>
<td>2,529</td>
<td>24</td>
</tr>
<tr>
<td>ФР / RHY phonological awareness</td>
<td>3,62</td>
<td>0,870</td>
<td>3,69</td>
<td>0,630</td>
<td>24</td>
</tr>
<tr>
<td>ФФ / PS rhyme test</td>
<td>4,46</td>
<td>2,066</td>
<td>4,31</td>
<td>2,689</td>
<td>24</td>
</tr>
<tr>
<td>ФФ / PD phonological awareness</td>
<td>2,23</td>
<td>1,363</td>
<td>3,15</td>
<td>2,035</td>
<td>24</td>
</tr>
<tr>
<td>ФФ / PT test for rhyme</td>
<td>3,92</td>
<td>1,801</td>
<td>4,00</td>
<td>2,121</td>
<td>24</td>
</tr>
<tr>
<td>СВ / SPOON phonological awareness</td>
<td>0,54</td>
<td>0,660</td>
<td>0,38</td>
<td>0,650</td>
<td>24</td>
</tr>
</tbody>
</table>

Т-тестот беше користен за испитување на разликуте мегу девојчиња што пелтечат и девојчиња што зборуваат течно. Резултатите не открија статистички значителни разлики мегу двете анализирани групи за варијаблите што ја општуваат фонолошката свест (табела 4).

Табела 5. Разлики мегу деца што пелтечат и деца што зборуваат течно во однос на варијаблата анализа на фонеми – скала на резултати.

<table>
<thead>
<tr>
<th>Варијабли / Variables</th>
<th>Деца што пелтечат / Stuttering children (ДП / SC)</th>
<th>Деца што зборуваат течно / Children with fluent speech (ДЗТ / FC)</th>
<th>df</th>
<th>t-test</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>РА-СС / АФ-СП section / All subjects</td>
<td>9,66</td>
<td>2,585</td>
<td>10,75</td>
<td>2,527</td>
<td>62</td>
</tr>
<tr>
<td>M / M - м и м</td>
<td>9,47</td>
<td>2,855</td>
<td>10,68</td>
<td>2,689</td>
<td>36</td>
</tr>
<tr>
<td>Ж / F - ж и ф</td>
<td>9,92</td>
<td>2,216</td>
<td>10,85</td>
<td>2,375</td>
<td>24</td>
</tr>
</tbody>
</table>

The results of examination of differences in the analysed variable Phonological awareness score (PAS) between male stuttering children and their fluent peers, showed that there were no statistically important differences between the subjects. But, in individual variables, which describe the phonological awareness among male stuttering children and male children with fluent speech we found that there was statistical difference between subjects in variable Rhyme (RHY) (Table 3).

Table 4. Differences between female subjects of both subjects group in relation to the variable Phonological awareness score and individual variables, which describe phonological awareness.

The T-test was used for examination of the differences between female children who stutter and female children with fluent speech. The results did not reveal statistically significant differences between the two analysed groups for the variables, which describe phonological awareness (Table 4).

Table 5. Differences between stuttering children and children with fluent speech in relation to variable Phonemic analysis - Scaled scores.

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Phonological awareness is the awareness of the basic units of sound and it is measured in terms of the ability to compare and manipulate the units of speech within words and syllables (14). Phonological awareness relates to metalinguistic knowledge of language sound structure, phonological structure of words, sentences or utterances (7). Different authors argued that phonological awareness describes children's developing sensitivity to the sub lexical, segmental structure of the phonological domain of language, including sensitivities to larger and smaller units (15).

In this research, stuttering children scored between high-average and high, while non-stuttering children scored high in the Phonological awareness test. There was no statistically significant difference between the experimental and the control group in the variable Phonological awareness score which represent the total score obtained on the Test of phonological awareness. The result of this research showed that there was no statistically significant difference between stuttering and non-stuttering children in phonemic analysis abilities in relation to age and sex. Many experts (11, 16, 17) in their researches aimed to explain the existence of a connection between stuttering and phonological difficulties. However, this hypothesis has not been confirmed yet. It can be claimed that stuttering children have mildly lower phonological abilities than children with fluent speech, but they are generally at above average level, and the results in this research have confirmed that. Phonological disorders continue to co-occur with stuttering, and the persistence of this disorder may contribute to the persistence of stuttering (18). Sardelic, Benneti and Hrastinski compared the research results of phonological awareness between stuttering and non-stuttering children, and they found that there were no differences in the development of phonological awareness between stuttering and non-stuttering children (7). Authors discovered that stuttering children scored lower than non-stuttering children in all examined variables, which describe phono-
results of the analysis that did not show significant differences in terms of stuttering onset. However, these differences were not statistically significant (7). Gregg and Yairi conducted a study whose purpose was to determine whether there are relationships between phonological skills and the initial characteristics of stuttering. The study focused on preschool children near the onset of stuttering, between 29 to 49 months, were divided into two groups based on the level of phonological ability: minimal phonological deviations and moderate phonological deviations. The children’s level of stuttering-like disfluencies was examined. Results revealed no statistically significant differences in the stuttering characteristics of the two groups near onset, calling into question the nature of the stuttering-phonology link (19).

37.4% of the stuttering children have articulation and phonological disorders (9). Prevalence estimates of phonological disorders in children not identified as having a stuttering problem range from 2% to 13% (8). In contrast, it is commonly reported that 30% - 40% of children who stutter have a co-occurring phonological disorder (8). Authors describe relationships between speech, language, and related behaviours exhibited during an initial diagnostic evaluation by 2- to 6-year-old children referred for evaluation of their speech and language development. The diagnostic testing revealed that a proportion of these children exhibited concomitant difficulties with language, phonology, or oral motor skills, suggesting that stuttering is not necessarily independent of other aspects of children's speech and language development (9).

Paden, Yairi, Ambrose suggested that little attention has been given to differences between the phonological abilities of children whose stuttering persists and those who recover. Their investigation compared these two groups soon after stuttering onset, before it was possible to classify them as members of
either group, on a number of phonological characteristics, including mean percentage of error, relative levels of severity of phonological impairment, error on specific phonological patterns, progress in development of key patterns, and the children's strategies for coping with unmastered patterns. The results indicate that the children whose stuttering would be persistent had poorer mean scores on each of their measures than did the children who would recover from stuttering. Both groups, however, showed progression in phonological development that followed the expected order, and they used typical strategies when patterns had not yet been acquired. The persistent group was moving more slowly, however, so phonological development was more delayed than in the children who would recover from stuttering (17). Speech production could be marked by frequent hesitations, repetitions, and prolongations in an attempt to obtain additional processing time for lexical and/or phonological encoding or as a result of trade-offs between lexical and phonological formulation processes and speech fluency (20).

In this study, examination of differences between individual variables, which describe phonological awareness, showed that there was statistically significant difference in variable Rhyme. After assessment of the differences between stuttering and non-stuttering children in relation to gender, the results revealed that male stuttering subjects scored statistically significant lower result in variable Rhyme in relation to males in control group. The results did not reveal statistically significant differences between female stuttering children and their fluent peers for the variables, which describe the phonological awareness. Rhyming ability is an important early phonological skill, and an important component in the development of language, reading and writing (3). Weber-Fox, Spruill, Spencer and Smith used a visual rhyming paradigm in ten school-age children who stutter between 9 years 4 months and 13 years 9 months and ten children who do not stutter. That was measured by electrophysiological activities in visual rhyme judgment tasks. The authors reported that children who stutter have reduced behavioural...
Заклочок

Резултатите од спроведеното истражување покажаа дека фонолошката свест кај деца што пелтечат е мегу две вредности: над просек и висока, додека децата што не пелтечат покажуваат високи резултати на истата скала. Статистички значајни разлики меѓу децата што пелтечат и што не пелтечат, во просечните резултати за фонолошка свест не беа пронажени во ова истражување.

Conclusion

The results of the conducted research showed that phonological awareness of stuttering children was between two values: above average and high, while non-stuttering children scored high on the same points scale. Statistically significant differences between stuttering and non-stuttering children, in average result of phonological awareness were not found in this research.
The examination of the differences of stuttering and non-stuttering children in individual variables, which describe phonological awareness, showed that these two groups statistically significantly differ in terms of ability to rhyme. Low phonological awareness of male stuttering subjects contributed to these differences. There were no statistically significant differences in other individual variables, which describe phonological awareness ability between stuttering children and their fluent peers. The results suggest that during the process of evaluation and diagnostics of stuttering children, special attention should be paid to their linguistic abilities. Precise diagnostics would even ensure guidelines in the treatment of stuttering in terms of approach and strategies which imply development of phonology and phonological awareness in stuttering children during their treatment.

**Conflict of interests**

Authors declare no conflict of interests.
Литература/ References