The Impact of Demographic and Socio-Economic Conditions on the Prevalence of Speech Disorders in Preschool Children in Bitola

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SUMMARY

Introduction Speech development in preschool children should be consistent with a child's overall development. However, disorders of speech in childhood are not uncommon.

Objective The purpose of the study was to determine the impact of demographic and socio-economic conditions on the prevalence of speech disorders in preschool children in Bitola.

Methods The study is observational and prospective with two years duration. During the period from May 2009 to June 2011, 1607 children aged 3 and 5 years, who came for regular examinations, were observed. The following research methods were applied: pediatric examination, psychological testing (Test of Chuturik), interviews with parents and a questionnaire for behavior of children (Child Behavior Checklist – CBCL).

Results 1,607 children were analyzed, 772 aged three years, 835 aged five years, 51.65% male and 49.35% female. The prevalence of speech disorders was 37.65%. Statistical analysis showed that these disorders were more frequent in three years old children, males living in rural areas and in larger families. They did not have their own rooms at home, they were using mobile phones and were spending many hours per day watching television, ($p<0.01$). Also, children whose parents had lower levels of education and were engaged in agriculture, often had significant speech disorders, ($p<0.01$).

Conclusion Speech disorders in preschool children in Bitola have a high prevalence. Because of their influence on later cognitive development of children, the process requires cooperation among parents, children, speech and the audiologist with the significant role in prevention, early detection and treatment.

Keywords: dyslalia; developmental dysphasia; preschool children; socio-economic conditions

INTRODUCTION

Mental health of children and the prevention of its disorders, takes an important place in the healthcare of preschool children. Their development and maturation occurs under the influence of genetic factors that interact with external factors. The hereditary factors are polygenic and play a significant role in increasing the possibility of developing certain disorders, only in relation to the family, social and cultural factors [1]. Children's behavioral disorders can be regarded as indicators for disorders in general environment [2]. The care and upbringing of children, as well as measures that parents use, are very important [3]. The speech development in preschool children is also highly significant. It is a useful indicator of the development of children's cognitive abilities and is correlated with later school achievement [4]. Most of children show a significant progress in speech during the first 4 years of life. All early deterioration should be therefore disclosed [5]. According to the worldwide literature data, it is emphasized that a large number of children with speech disorders in the preschool period have permanent speech disorders later in school achievement and their life [6, 7]. Primary disorders include speech delay, speech and receptive problems. Language and spoken slowdown in children are associated with increased difficulties in reading, writing, attention and socialization. Atypical language development may be a secondary characteristic of physical and developmental problems in childhood. Secondary speech and language slowdown are associated with other conditions, such as hearing problems, intellectual disabilities, autism, physical problems, etc. [8, 9]. The speech-language development and social environment are mutually related [10]. The risk factors for speech disorders are: family history of spoken slowdown, masculine and perinatal factors, and less risky factors, i.e. the level of education of parents, birth order of the child and family size [4]. Also, some habits in children, as sucking fingers, can affect the development of speech disorders [11]. The treatment and rehabilitation of children with speech disorders include the child and family and the team of professional speech therapist, psychologist and child psychiatrist, with special attention to parent's education. Such therapy is very effective in these children. Early phonological and metaphonological intervention can help normalize the development of speech and normal acquisition of written skills in children [12].

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OBJECTIVE

The aim of the study was to determine the prevalence of speech disorders in preschool children in Bitola and to quantify its possible connection with certain demographic characteristics of children (age, sex, breastfeeding), family and socio-economic conditions in their families (town, village, having or not having their own room, the number of family members, birth order of the child, education level of parents, family income), as well as the habits of children (using computer, mobile phone or watching television for several hours).

METHODS

The study was conducted at the Health Centre in Bitola, in the office for preventive healthcare for children aged 0-6 years. In the epidemiological, prospective, two-year study, 1607 children aged 3 and 5 years were included. They came for regular medical checkups in the period from May 2009 to June 2011. Children born within the normal perinatal period, without the risk of birth, with normal psychomotor development, were included in the study. Children born with any kind of risk, as well as children in whom the psychological testing was unsuitable for their age, were excluded from the study. Questionnaires that were not properly and completely filled out by parents were not analyzed. During the study the following methods were applied: psychological testing (Test of Chuturik), pediatric examination, method of interview with parents, questionnaire about the behavior of children by Achenbach [13]. The Chuturik test is a standardized test for the psychomotor development of children in the early childhood period, the 5th year. Child Behavior Checklist by Achenbach is a multicentric empirically based set of statements to evaluate the behavior of children by their parents. There is a list of 113 statements that describe some characteristics of the child, which occur later than the last two months. This questionnaire includes features that characterize internal and external behavior of children. In the study, of all speech disorders in children, only disorders in pronunciation of certain sounds (dyslalia) and disturbances in expressive speech (developmental dysphasia) are analyzed. The conclusion of the existence of these disorders in children was adopted on the basis of analysis of the questionnaires for children's behavior, conversation with parents and clinical examination.

The results were statistically processed, and the following methods were used: the distribution of qualitative data presented in absolute and relative numbers, and for testing the significance of differences in speech disorders occurrence in terms of analyzed parameters non-parametric statistics was used (Pearson chi-squared Yates chi- square test). The significance was determined for the level of $p<0.05$ and $p<0.01$. For quantifying the link between certain factors and the presence of disorders in speech, the method of logistic regression analysis was used.

RESULTS

In the analyzed two-year period, in total 1,980 children on regular check-ups were invited to be included in the study. After psychological testing and analysis of the Child Behavior Checklist, the group of respondents consisted of 1,607 children, who had psychomotor development and behavior adequate for their age, 772 of them were three years old and 835 were five years old, 50.65% male and 49.35% female. Six hundred and five (37.65%) had speech disorders, 230 children aged 3 and 102 five-year old chil-

Table 1. Disorders of speech in relation to age and sex of children, breastfeeding, place of residence, having or not having one's own room, using computer, mobile phone and television

Variable		Speech disorders		p-level
		Yes	No	
Age	3 years	377 (48.83%)	395 (51.17%)	0.000*
	5 years	228 (27.31%)	607 (72.69%)	
Sex	Male	370 (45.45%)	444 (54.55%)	0.000*
	Female	235 (29.63%)	558 (70.37%)	
Duration of breastfeeding	>12 months	127 (38.02%)	207 (61.98%)	0.45
	7–12 months	200 (36.36%)	350 (63.64%)	
	Up to 6 months	210 (37.10%)	356 (62.90%)	
	Not breastfed	68 (43.31%)	89 (56.69%)	
Place of residence	Town	330 (31.34%)	723 (68.66%)	0.000*
	Village	275 (49.64%)	279 (50.36%)	
Having own room	Yes	213 (33.97%)	414 (66.03%)	0.015*
	No	392 (40.00%)	588 (60.00%)	
Using computer	Yes	239 (35.41%)	436 (64.59%)	0.11
	No	366 (39.27%)	566 (60.73%)	
Watching TV	Yes	409 (42.05%)	572 (57.95%)	0.000*
	No	196 (31.31%)	430 (68.69%)	
Using mobile phone	Yes	291 (42.05%)	401 (57.95%)	0.001*
	No	314 (34.32%)	601 (65.68%)	

* statistically significant

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Table 2. Speech disorders in children, in terms of the number of family members, birth order of the child and education of parents

Variable		Speech disorders		p-level
		Yes	No	
Family members	<3	64 (33.86%)	125 (66.14%)	0.010*
	4	179 (33.52%)	355 (66.48%)	
	>4	362 (40.95%)	522 (59.05%)	
Order of child birth	First	274 (33.95%)	533 (66.05%)	0.009*
	Second	292 (41.36%)	414 (58.64%)	
	Third, fourth, etc.	39 (41.49%)	55 (58.51%)	
Father's education	High	65 (31.71%)	140 (68.29%)	0.007*
	Secondary	383 (36.76%)	659 (63.24%)	
	Primary	155 (44.41%)	194 (55.59%)	
	Without education	2 (18.18%)	9 (81.82%)	
Mother's education	High	95 (29.50%)	227 (70.50%)	0.000*
	Secondary	306 (36.17%)	540 (63.83%)	
	Primary	197 (47.82%)	215 (52.18%)	
	Without education	7 (25.93%)	20 (74.07%)	

* statistically significant

Table 3. Speech disorders in children in relation to parental employment and family income

Variable		Speech disorders		p-level
		Yes	No	
Employment of parents	Father	291 (41.04%)	418 (58.96%)	0.001*
	Mother	33 (34.38%)	63 (65.63%)	
	Both	150 (30.36%)	344 (69.64%)	
	Nobody	47 (39.83%)	71 (60.17%)	
	Farmers	84 (44.21%)	106 (55.79%)	
Material income	Social help	46 (39.32%)	71 (60.68%)	0.39
	Minimal	150 (38.86%)	236 (61.14%)	
	Average	328 (38.27%)	529 (61.73%)	
	Above average	81(32.79%)	166 (67.21%)	

* statistically significant

dren had dyslalia, while developmental dysphasia was found in 147 three-year old and 126 five-year old children.

Table 1 shows the results of the presence of speech disorders in relation to age and sex of the children, breastfeeding, place of residence, having or not having one's own room, using the computer, mobile phone and television.

The results showed that, of the total number of respondents, speech disorders were significantly more frequently reported in male children aged 3 years, compared to 5-year old girls, ($p<0.01$). The place of residence had a highly statistically significant impact on the appearance of speech disorders, ($p<0.01$); 49.64% children in rural areas were faced with such disorders, versus 31.34% children from urban areas. Also, children who did not have room in their homes, significantly more often had disorders in speech as compared to children with their own room, ($p<0.05$). After testing the differences, the presence of speech disorders in children and using computer, mobile phone and watching TV for many hours, statistical significance was determined with regard to mobile phone usage and TV watching ($p<0.01$).

The results of the examination for the manifestation of speech disorders in children, in terms of family structure (number of family members, birth order of the child, education of parents) are shown in Table 2.

The distribution in terms of the number of family members, showed that children who were living in larger families often manifested speech disorders, (40.95%) and tested differences were statistically significant, ($p<0.05$). Speech disorders were significantly more often found in children who were born as a second, third, and other in the family, compared to the firstborn, (41.49% vs.33.95%, $p<0.01$), and the children of families whose parents had primary education, $p<0.01$.

Table 3 shows the results of the presence of speech disorders in children in relation to parental employment and family income.

The displayed distribution for the occurrence of speech disorders indicated that they were mostly registered in subjects whose parents were engaged in agriculture, and at least in children whose parents were employed, (44.21% vs. 30.36%). The tested differences were statistically significant ($p<0.01$). In terms of material income in families, the results showed that the disorders in speech were insignificantly more frequent in children who lived in families that were users of social welfare, and in families with minimal income (39.32 % and 38.86%, respectively, $p>0.05$).

Table 4 shows the results of logistic regression analysis for risk factors that have the predictor role or influence on the occurrence of speech disorders in children younger than 5 years.

By using the univariate analysis, for the occurrence of speech disorders in children the following were confirmed as significant risk factors: child's age up to 3 years old, male, living in rural areas, lack of room in one's home, lower level of education of parents, parents - farmers, using a mobile phone and watching TV many for hours per day.

DISCUSSION

The obtained results in the study showed that the prevalence of speech disorders in children was 37.65%, with a significantly higher manifestation on 3-year old male children. In world literature data different results are shown.

Table 4. Logistic binary regression

Variable		Sig.	Exp(B)	OR 95% CI	
				Lower	Upper
Age – 3 years	5 years	0.000*	0.394	0.320	0.484
Sex – male	Female	0.000*	0.505	0.411	0.621
Place of residence	Village	0.000*	2.159	1.748	2.668
Having own room	Does not have	0.015*	1.296	1.051	1.597
Family members – 3 members	4 members	0.932	0.985	0.693	1.399
	>4 members	0.071	1.354	0.974	1.884
Order of childbirth – first	Second	0.003*	1.372	1.113	1.691
	Third, fourth and so on	0.148	1.379	0.892	2.132
Mother's education – high	Secondary	0.032*	1.354	1.026	1.787
	Primary	0.000*	2.189	1.609	2.978
	Without education	0.695	0.836	0.342	2.044
Father's education – high	Secondary	0.169	1.252	0.909	1.724
	Primary	0.003*	1.721	1.198	2.472
	Without education	0.355	0.479	0.101	2.278
Employed parents – both	Father	0.000*	1.597	1.252	2.036
	Mother	0.437	1.201	0.756	1.908
	Farmers	0.001*	1.817	1.288	2.565
	No one	0.049*	1.518	1.002	2.300
Material income above average	Average	0.117	1.271	0.942	1.714
	Minimal	0.122	1.303	0.931	1.822
	Social help	0.223	1.328	0.841	2.095
Not using	Computer	0.115	0.848	0.690	1.041
	Mobile phone	0.002*	1.389	1.133	1.702
	TV	0.000*	1.569	1.270	1.938

* statistically significant

Zubrick et al. [14] analyzed 1,766 children aged 2 years, in 13.4% of children speech disorders (late occurrence) were noted in those who had a significant family history, male gender and early neurobiological growth. In the study, tests for the presence of speech disorders in children concerning breastfeeding showed that children who were not breastfed often manifested speech disorders, compared to the remaining ones. Ferguson and Molfese [15] stated that breastfeeding was found to be a protective factor for the development of speech disorders in children. Fox et al. [16] concluded that speech disorders had a high incidence in children who used a pacifier bottle for a long time. The delayed usage of a bottle during the infant feeding, at least 9 months of age, may also be protective for the development of speech disorders [11]. Andres et al. [17] also found that breastfed children during testing showed advantage in cognitive development (mental, linguistic) compared to those who were fed with milk formula. The obtained results in this study showed that speech disorders were significantly more common among children in rural areas compared to those who had not their own room at home, those who lived in larger families and were born second, third and so on. Nelson et al. [4], on the other hand, found that the number of members in the family, and birth order of the child, were fewer risk factors for the occurrence of disorders in speech. The results in the study also showed that disorders in speech were significantly more common in children whose parents had primary education and were working as farmers and in children of families that were welfare recipients. However, some authors concluded that the occurrence of speech disorders does not depend on the educational level of parents and social status [14]. Mikelić et al. [18], on the other hand, stated that the rehabilitation of children with speech disorders should normally be in the family environment, monitored by a team of experts (psychiatrist, psychologist, audiologist) during which the educational level of the parents was very significant. The presence of speech disorders among respondents in terms of using a computer, mobile phone and television, was significantly higher in children who used a mobile phone and who were watching TV for a long time.

CONCLUSION

The study showed that the prevalence of speech disorders among preschool children in Bitola was 37.65 %. In the study, the significant correlation between the occurrence of these disorders in children with familiar factors and socio-economic conditions in which children lived was also established. Thus, the reasons for their occurrence should be sought in the family. It is very important that parents should be aware of the existence of these disorders in their children, and they should critically consider the reasons for their appearance, harmful consequences that could arise, and should promptly seek help from the appropriate competent experts. Also, a serious daily involvement of health professionals dealing in preventive healthcare is necessary, by working on prevention, and also early detection and treatment of speech disorders in children in

collaboration with the child and hers/his family. Their mutual commitment is to increase their activity to the proper care and education of children, overcoming all factors that are predictors for the occurrence of certain problems, early detection of any changes in children, careful application of reason and involving team action for their improvement.

NOTE

This manuscript is a part of Domnika Rajchanovska's doctoral dissertation titled "Epidemiological Studies of Behavioral and Emotional Disorders in Children of Preschool Age".

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Утицај демографских и социјално-економских услова на распрострањеност говорних поремећаја код деце

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КРАТАК САДРЖАЈ

Увод Развој говора код деце предшколског узраста треба да буде у складу са целокупним развојем детета. Међутим, поремећаји говора код деце нису неуобичајена појава.

Циљ рада Циљ истраживања је био да се одреди утицај демографских и социјално-економских услова на распрострањеност говорних поремећаја код деце предшколског узраста у Битољу, у Македонији.

Методе рада Истраживање је било опсервативно и проспективно, а трајало је од маја 2009. до јуна 2011. године. Током те две године испитивана су деца узраста од три године и пет година која су редовно долазила на прегледе. Примењене су следеће истраживачке методе: педијатријски преглед, психолошко тестирање (Чутуриков тест), разговор с родитељима и упитник за испитивање понашања детета (енгл. *Child Behavior Checklist – CBCL*).

Резултати Испитано је 1.607 деце, и то 772 трогодишњака и 835 петогодишњака. Дечаци су чинили 51,65% испитаника, а девојчице 49,35%. Преваленција говорних поремећаја била је 37,65%. Статистичка анализа је показала да се ови поремећаји чешће јављају код трогодишњих дечака који живе у руралним областима и у многочланим породицама. Ова деца немају код куће своју засебну собу и свакодневно проводе сате гледајући телевизију ($p<0,01$). Код деце чији су родитељи нижег степена образовања и баве се пољопривредом такође могу да се јаве значајни поремећаји говора ($p<0,01$).

Закључак У Битољу је утврђена висока преваленција деце предшколског узраста са говорним поремећајима. С обзиром на утицај који ови поремећаји имају на каснији когнитивни развој детета, процес превенције, раног откривања и лечења захтева сарадњу родитеља, детета и аудиолога, што у целости игра значајну улогу.

Кључне речи: дислалија; развој дисфазије; деца предшколског узраста; социјално-економски услови

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