



ORIENTATION AND MOBILITY OF VISUALLY IMPAIRED CHILDREN IN RELATION TO CHRONOLOGICAL AGE AND GENDER

Original scientific paper

Dzenana Radzo Alibegovic¹, Sevala Tulumovic¹

¹Faculty of Education and Rehabilitation Sciences, University of Tuzla, Bosnia and Herzegovina

Received: 2021/6/10

Accepted: 2021/8/18

ABSTRACT

The aim of this study was to examine the orientation and mobility in children with visual impairment in relation to gender and chronological age. The study included a sample of 35 respondents with visual impairment, aged between 7 and 15. The research was conducted in Sarajevo at the “Centre for Blind and Visually Impaired Children and Youth - Nedžarići” (Bosnian: Centar za slijepu i slabovidnu djecu i omladinu Nedžarići). The results of the research showed that there were statistically significant differences in relation to chronological age obtained on the variables “orientation indoors and in buildings” and “orientation in the yard”, and that there is a relation between orientation and mobility and chronological age on the variables “orientation indoors and in buildings” and “orientation in the yard”. Gender has no significant effect on the orientation and mobility abilities of visually impaired students.

Key words: orientation and mobility, visually impaired children

INTRODUCTION

The term orientation and mobility contains two basic terms that in their root, according to (Hornby, 2000) have the following meaning: orientate - “exactly determinate the position”, or “accurately determine the position” and mobile - “moving, easily and quickly from place to place”, that is, “to move easily and quickly from one place to another”. Kay (1999) defines orientation as “awareness of the current position in space, determining space, and moving through it”. Orientation in space is the ability of an organism to react to any change in the surrounding environment, i.e. to place analyzers in the best position for the analysis of stimulus reception and response to them (Dikic & Zigic, 2010). In addition to the term orientation and movement, the term mobility is often used, but it does not only mean movement through a certain space, or locomotion,

but it also means “mental orientation”, i.e. the ability of an individual to recognize the environment and its spatial and temporal relations (Zovko, 1994). Orientation is used to get introduction and evaluation, and mobility is used to master space. Mobility encompasses all movements and motor skills involved in movement (Jablan, 2007). Mobility for visually impaired children also has a significant cognitive value because it expands the possibility of gaining direct experience about various objects and phenomena with which contact is made (Radzo Alibegovic, 2013). Orientation and mobility include basic skills, travel, use of public transport etc. (Fazzi & Petersmeyer, 2001). The main goal of this study was to determine the differences in orientation and mobility in respondents with visual impairment in relation to gender and chronological age.

Correspondence to:

Dzenana Radzo Alibegovic, Faculty of Education and Rehabilitation Sciences, University of Tuzla, Bosnia and Herzegovina
Univerzitetska 1 Street, 75000 Tuzla, Bosnia and Herzegovina
E-mail: dzenana.radzo@untz.ba

METHODOLOGY

The study included a sample of 35 respondents with visual impairment, aged between 7 and 15. The distribution of respondents with respect to chronological age and gender is shown in Table 1, and Table 1 shows that there were 19 male respondents with impaired vision and 16 female respondents with impaired vision. The average age of the visually

impaired respondents is 12.25 years. The average chronological age of male respondents is 12.58, and the average chronological age of female respondents is 11.88. It can be seen from Table 1 that the difference in arithmetic means between the chronological age of male and female respondents is not statistically significant at the significance level of .05.

Table 1. Average chronological age of respondents with visual impairment

GENDER	\bar{X}	SD	N	df	t	P _{sig}
Male	12.58	2.32	19	33	.864	.39
Female	11.88	2.50	16			

Variables

Anamnestic variables:

1. gender
2. chronological age

Variables for orientation and mobility assessment

1. orientation towards one's own body
2. body posture
3. operating with concepts
4. physical abilities
5. auditory abilities
6. orientation indoors and in buildings
7. orientation in the yard

METHODS

The research was conducted in Sarajevo at the "Centre for Blind and Visually Impaired Children and Youth - Nedzarici". All respondents were examined individually in a separate room and in a pleasant environment.

Measuring/evaluation instruments

Orientation and mobility were examined using the Instrument for Assessing the Mobility of the Blind (Zovko, 1994). The instrument contains 10 areas in which 159 tasks are embedded. For the purposes of this research, 7 areas were used, which relate to:

- orientation towards one's own body
- body posture
- operating with concepts
- physical abilities
- auditory abilities
- orientation indoors and in buildings
- orientation in the yard.

Medical data analysis was used to collect data on visual acuity and type of visual impairment. The analysis of pedagogical-psychological documentation was used to collect data on gender, chronological age and intellectual level.

Data processing methods

After the research, the obtained data were processed by the statistical program SPSS 16.0 for Microsoft Windows operating system. Basic statistical parameters were calculated: minimum and maximum results, arithmetic mean and standard deviation. The t-test was used to determine the significance of the differences, and the statistical significance of the correlation between the observed variables was determined by the Pearson and Spearman coefficients.

RESEARCH RESULTS

For the purposes of the research, the respondents were divided into 2 groups: Younger respondents aged 7-12 years, and older respondents aged 13-15 years.

Table 2 shows the results of the research related to the existence of statistically significant differences in arithmetic means in orientation and mobility in respondents with visual impairment in relation to chronological age. It was not possible to determine the existence of statistically significant differences on the variable of "auditory abilities" because both older and younger respondents scored the same, maximum, number of points on that variable. Statistically significant differences were recorded on the variables "orientation indoors and in the buildings" and "orientation in the yard" ($p < .05$). On these variables, older respondents achieved better results. On the variable "orientation indoors and in the buildings" the correlation was achieved at the level of significance of .01, and on the variable "orientation in the yard", the correlation was achieved at the level of .05. There were no statistically significant differences in arithmetic means or correlations on the other variables.

Table 2. Orientation and mobility of respondents with visual impairment in relation to chronological age

Variable	Younger (N=15)		Older (N=20)		t	P _{sig}	r _s	P _{sig}
	\bar{X}	SD	\bar{X}	SD				
Orientation towards one's own body	124.00	8.31	123.10	10.90	.26	.79	-.03	.84
Body posture	18.00	.00	17.90	.30	1.25	.22	-.21	.22
Operating with concepts	24.00	.00	22.70	5.36	.94	.36	-.21	.22
Physical abilities	24.00	.00	23.90	.45	.86	.39	-.15	.39
Auditory abilities	12.00	.00 ^a	12.00	.00 ^a	a.	a.	a.	a.
Orientation indoors and in buildings	72.08	3.09	75.55	2.01	-3.18	.00	.51	.00**
Orientation in the yard	41.20	3.84	43.55	2.01	-2.35	.02	.40	.01*
Orientation and mobility in total	316.00	10.74	318.70	17.57	-.52	.60	.24	.16

*correlation significant at the significance level of .05; ** correlation significant at the significance level of .01

a. It is not possible to determine the significance of arithmetic mean differences and correlation because at least one of the variables is constant

Table 3 shows the results of determining statistically significant differences in the arithmetic means of the observed variables from orientation and mobility in relation to gender. It is evident that there were no statistically significant differences in the orientation and mobility of respondents with visual impairment in

relation to gender, except for the variable "orientation in the yard". On this variable, a correlation of medium strength was achieved at the level of .05. On the variable "orientation towards one's own body", a low correlation was achieved at the level of .05.

Table 3. Orientation and mobility of respondents with visual impairment in relation to gender

Variable	Male (N=19)		Female (N=16)		t	P _{sig}	r _s	P _{sig}
	\bar{X}	SD	\bar{X}	SD				
Orientation towards one's own body	120.63	12.00	126.87	4.50	-196	.06	.36	.03*
Body posture	17.95	.23	17.94	.25	.12	.90	-.02	.90
Operating with concepts	22.74	5.50	23.88	.50	-.82	.41	-.01	.94
Physical abilities	23.89	.46	24.00	.00	-.91	.36	.15	.37
Auditory abilities	12.00	.00	12.00	00	a.	a.	a.	a.
Orientation indoors and in buildings	75.05	2.25	73.56	3.32	1.57	.12	.26	.13
Orientation in the yard	43.89	.46	40.94	4.09	3.13	.00	-.42	.01*
Orientation and mobility in total	316.16	17.80	319.19	10.82	-.59	.55	.06	.74

* correlation significant at the significance level of .05; ** correlation significant at the significance level of .01

a. It is not possible to determine the significance of arithmetic mean differences and correlation because at least one of the variables is constant

DISCUSSION

The results of this study examining the orientation and mobility of respondents with visual impairment in relation to chronological age showed that there was no statistically significant difference between the arithmetic means of younger and older respondents for the variables: orientation towards one's own body, body posture, operating with concepts, physical abilities and orientation and mobility in total. Statistically significant differences were achieved on the variables orientation indoors and in buildings, and orientation in the yard. On these variables, older respondents with impaired vision achieved better results compared to younger respondents with impaired vision. Also, a positive correlation was achieved on these variables.

One of the reasons why older respondents in relation to younger respondents achieved statistically significant differences in the results on these variables is that the training in orientation and mobility goes in a certain order. Generally speaking, for successful orientation and movement of visually impaired people, it is necessary to adopt important concepts such as concepts about one's own body, its parts, concepts about the body-environment relationship, concepts about the position and shapes of objects and their relationship in space, etc. The time of transition to the use of a cane and other methods of orientation and movement is determined individually depending on whether the blind person has mastered the knowledge and skills necessary for successful introduction to independent coping and movement.

Older respondents are better at orienting in buildings and indoors and orienting in the yard because the development of these more complex skills takes more time and because they are older and therefore are longer covered by training in orientation and mobility. There were no statistically significant differences in arithmetic means from orientation and mobility in relation to gender. The males and females examined achieved approximately equal results on the examined variables except on the variable of orientations in the yard. On this variable, the male respondents achieved better results, and there was a statistically significant difference. Given that all other examined variables are equally developed; we are of the opinion that this difference can be ignored. There were also no statistically significant correlations between orientation and mobility and gender of respondents with visual impairment. Kuduzovic (2012) conducted a study where he examined the influence of gender and age on orientation and mobility. The sample consisted of 40 respondents aged 7-14. He came to the conclusion that gender has no effect on the ability of orientation and mobility of students with visual impairment. Older respondents with visual impairment achieved better results on almost all examined variables compared to younger respondents. Krucanin (1988) assessed the development of spatial orientation in children with a high degree of visual impairment. The children were divided into 7 groups: aged 7-8, 9-10, 11-12, 13-14, 15-16, 17-18, 19-20. He concluded that spatial orientation of blind children, when walking, improves with age. Ochaita and Huertas (1993) examined the recognition of an unfamiliar/unknown environment on a sample of 40 blind children and adolescents. They concluded that older respondents achieve better results when recognizing an unfamiliar/unknown environment.

CONCLUSIONS

The results of the examination of the ability of orientation and mobility in relation to the chronological age of respondents with visual impairment showed that statistically significant differences were obtained on the variables “orientation indoors and in buildings” and “orientation in the yard”.

There is a relation between orientation and mobility and chronological age on the variables “orientation indoors and in buildings” and “orientation in the yard”. Older respondents with visual impairment have a better developed ability of orientation indoors and in buildings and orientation in the yard compared to younger respondents with visual impairment. There are no statistically significant differences in arithmetic means in respondents with visual impairment between orientation and mobility and gender, except for the variable “orientation in the yard”.

REFERENCES

- Dikic, S., & Zigic, V. (2010). *Orijentacija i kretanje lica ostecenog vida - peripatologija* [Orientation and mobility of visually impaired persons- peripathology]. Fakultet za specijalnu edukaciju i rehabilitaciju. Beograd: Centar za izdavačku delatnost.
- Fazzi, D.L., & Petersmeyer, B.A. (2001). *Imagining the possibilities*. New York: AFB Press.
- Hornby, A.S. (2000). *Oxford Advanced Learner's Dictionary*. London, Oxford University Press.
- Jablan, B. (2007). *Motorne i taktilne funkcije kod slepe dece* [Motor and tactile functions in blind children]. Beograd, Fakultet za specijalnu edukaciju i rehabilitaciju: CID.
- Kay, L. (1999). *Towards Objective Mobility Evaluation: some thoughts on a theory*. New York: American Foundation for the Blind.
- Krucanin, V.A. (1998). *Dinamika vrozastnih izmenenii v prostranstvennoi orijentirovke u detei s glubokim narušeniem zrenia* [Dynamics of age-related changes in spatial orientation in children with severe visual impairment]. Pedagogika, Defektologija, 3.
- Kuduzovic, A. (2012). *Uticaj programiranog vježbanja na orijentaciju i mobilitet slijepih učenika* [The impact of programmed exercise on the orientation and mobility of blind students]. Master's thesis, Faculty of Education and Rehabilitation Sciences, University of Tuzla.
- Ochaita, E. & Huertas, J.A. (1993). *Spatial Representation by Persons Who Are Blind: A Study of the Effects of Learning and Development*. Journal of Visual Impairment and Blindness 87 (2): 37-41. <https://doi.org/10.1177/0145482X9308700201>
- Radzo Alibegovic, Dz. (2013). *Uticaj motorickih i taktilnih funkcija na orijentaciju i mobilitet kod djece oštećenog vida* [The influence of motor and tactile functions on the orientation and mobility of visually impaired children]. Doctoral dissertation, Faculty of Education and Rehabilitation Sciences, University of Tuzla.
- Zovko, G. (1994). *Peripatologija I* [Peripathology I]. Zagreb: Skolske novine.