PROTOCOLS AND TECHNIQUES IN VISUAL ASSESSMENT OF CHILDREN WITH VARIOUS DISABILITIES

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ABSTRACT

PURPOSE: *To evaluate the understanding of eye-care providers about the protocols and techniques for visual assessment of children with disabilities and implementation of that knowledge in clinical practice.*

METHOD: *Descriptive cross-sectional study was carried out by 47 eye-care professionals working in different eye-care units from September to December 2021. The participants included both males and females which were working in different clinical setups. They were asked to fill a self-designed questionnaire to evaluate their knowledge about protocols and techniques for visual assessment of children with disability. Data was entered and analyzed by using SPSS vs. 25. Frequency and percentages were calculated by standard deviation. The p-value was calculated by Pearson Chi-square method. Informed consent was taken from each participant.*

RESULTS: *Results were taken out from the self-designed questionnaire which showed that out of 47 participants, 33 were males and 14 were females, 32 were optometrists and 15 were ophthalmologists. p-value is insignificant (p≥0.05) which shows both optometrists and ophthalmologists had good perception and knowledge about standards or protocols of visual assessment and when it comes to techniques, they had used different charts, tools and methods during visual functions assessment in children with various disabilities.*

CONCLUSION: *Eye-care professionals -have fair knowledge about the protocols and techniques for assessment. Both optometrists and ophthalmologists follow the protocols of assessment and apply various techniques for visual function assessment in children with disabilities.*

KEY WORDS: V*isual functions, visual acuity, contrast sensitivity, visual field, color vision and glare sensitivity.*

INTRODUCTION

Children with disability are one who have impairment of any body structure or function which causes capacity and performance limitation and also restrict their effective participation in society.[1] In my study, the children with intellectual, visual and hearing disability and speech and language disorders are visually assessed.

Children with disability encounters greater physical, psychological, intellectual and sensory impairments and have special needs that cause their exclusion from developmental agenda so they have poorer health conditions.[2] They usually face stigma and discrimination which restrict their access to special eye care services which leads to health inequalities.[3]

Children with disability have special needs during visual function assessment and ocular examination so unique set of protocols and techniques are needed to assess them properly. The number of children with visual impairment and developmental delay with or without further disabilities is increasing due to brain damage, prematurity, genetic disorders and cerebral palsy.[4] The children with disability or special health needs encounter many visual problems that should be addressed straight away and thorough visual assessment should be carried out.[5] As such children are usually at higher risk of vision impairment.[6] . Their visual abnormalities can be corrected through optical means and they should be encouraged to be tested.[7]

The visual assessment of children with disabilities

follows the identical standards as that of children without such disabilities.[6] Usually eye care providers assess multiple aspects of visual functions.[8]All subjects are assessed according to the protocols including; visual acuity, color vision, contrast sensitivity, visual field assessment, slit-lamp examination, fundus examination and follow up. Complete previous medical history is taken including any hereditary disorder or other diseases that affect visual function of the child.[9]Although visual assessment is a bigger challenge in children with disability, identifying their functional needs are also critical. Close work between eye care professionals, clear instructions and two-way referral system improves focus on visual assessment and its outcomes.[6]

All procedures involving people entail ethical problems. Ethics is the center of health care profession. Ethical codes guide health care professionals. Ethical principles that need to be emphasized are; autonomy, beneficence, non-maleficence, veracity, confidentiality, justice and fidelity.[10] Ethical issues are always interwoven into medical practice. Issues related to the clinical procedures performed on children with various disabilities, such as visual assessment, eye screening, all present to the eye care practitioner as ethical dilemmas. Issue is reviewed and related ethical consideration is applied. Relevant principle is identified and professional can conclude which procedure is ethically permissible for children.[11]

MATERIALS AND METHODS

It was descriptive cross-sectional analytical study, 47 was the sample size of individuals and they were eye care professionals (optometrists and ophthalmologists). Participants included both males and females which were working in different clinical setups. The data was collected 3 months after the approval of synopsis. Participants were asked to fill a self-designed questionnaire to evaluate their knowledge about protocols and techniques in visual assessment. Questionnaire included 20 items. Data was entered and analyzed by using SPSS vs. 25. Frequencies and percentages were found out for qualitative data and for quantitative data mean and standard deviation was used. The p-value was calculated by Pearson Chi-square method. Informed consent was taken from each participant.

RESULTS

Results were taken out from the self-designed questionnaire using statistical method which showed that out of 47 participants, 33 were males and 14 were females, 32 were optometrists and 15 were ophthalmologists. 28(59.6%) followed medical ethical codes while dealing with children with various disabilities. 1(2.1%) is not sure about following medical ethical codes while dealing with these children during their clinical practice. 17(36.2%) always follow ethical principles and codes in practice. 1(2.1%) sometimes take into consideration the medical ethical codes. Positive responses of following ethical principle of autonomy were 87.2% while that of confidentiality were 100%. 57.5% of eye-care professionals responded that they explain procedure of assessment before carrying it out. The use of sign language and other non-verbal ways of communication were used by 76.6% of eye-care providers. 68% of ECP responded that they see pupillary reaction of the child prior to visual function assessment. Only 19.1% of ECP used OKN drum test during the visual assessment of children having visual impairments as a suspect of blindness **[Table 2].**

Protocols	Qualification	Postive responses (yes/ always)	Negative responses (not sure/ sometimes / never)	p-value
Applying medical ethical codes	Optometrists	31	1	0.03
	Ophthalmologists	14	1	
Following principle of autonomy	Optometrists	30	2	0.03
	Ophthalmologists	11	4	
Following principle of confidentiality	Optometrists	32	0	0.21
	Ophthalmologists	15	0	
Ensuring friendly confortable environment	Optometrists	29	3	0.31
	Ophthalmologists	13	2	
Explaining procedure before assessment	Optometrists	19	13	0.25
	Ophthalmologists	8	7	
Do not treat such children with unnecessary symptoms	Optometrists	21	11	0.06
	Ophthalmologists	14	1	
Interrupt them while they are explaining their medical complaints	Optometrists	2	30	0.86
	Ophthalmologists	1	14	
Take consent from patient guardian	Optometrists	23	9	0.50
	Ophthalmologists	12	3	
Speak clearly without exaggerating mouth movements	Optometrists	28	4	0.23
	Ophthalmologists	15	0	
Involve child's guardian to convey you message	Optometrists	16	16	0.93
	Ophthalmologists	8	7	
Use of sign language	Optometrists	27	5	0.50
	Ophthalmologists	10	5	
Checking previous medical history	Optometrists	25	7	0.52
	Ophthalmologists	12	3	
See pupillary reaction	Optometrists	23	9	0.21
	Ophthalmologists	9	6	

The responses of participants related to the use of different charts in visual acuity assessment of children with various disabilities shows that 3(6.4%) out of 47(100%) use keys picture chart. 5(10.6%) of them use the lea symbol chart to measure visual acuity in children with disability. 8(17.0%) of them measure visual acuity in children with the use of lea number chart. 25(53.2%) of them measure visual acuity of children having disabilities with the help of ETDRS chart. 6(12.8%) of them used Snellen based charts to measure visual acuity in such children. Different charts used by optometrists and ophthalmologists to measure the contrast sensitivity in children with various disabilities are as follows; 4(8.5%) of respondents use hiding Heidi paddles to assess contrast sensitivity in children with various disabilities. 5(10.6%) of them measure the contrast sensitivity in such children using lea number contrast sensitivity chart. 6(12.8%) of them use lea symbol contrast sensitivity chart to measure contrast sensitivity in children. 27(57.4%) of them use pelliRobson chart to measure contrast sensitivity. 5(10.6%) never checked their contrast sensitivity during their practice (p=0.28).

Different techniques for color vision assessment used by respondents during visual assessment of children with various disabilities showed following results; 14(29.8%) out of 47(100%) use D-15 test for color vision assessment. 7(14.9%) of them use PV-16 test for the assessment of color vision. 25(53.2%) of them measure color vision of children with disability using Ishihara test. Only 1(2.1%) of them never checked color vision of such children (p=0.24). For visual field assessment participants responded in a way that 2(4.3%) of them used the method of finger mimicking for the assessment of field of vision in children. 34(72.3%) of them use confrontation for visual field assessment.6 (12.8%) of them measure visual field by using the technique of perimetry. 5(10.6%) of them never checked field of vision during assessment of children with various disability (p=0.34) **[Table 1].**

Techniques	Responses	Optometrists	Ophthalmologists	p-value
		Frequency / percentages	Frequency/ Percentage	
Visual Acuity assessment	Kays picture chart	1(2.1%)	2(4.2%)	0.01
	Lea number chart	5(10.6%)	3(6.4%)	
	Lea symbol chart	5(10.6%)	0(0.0%)	
	ETDRS chart	20(42.6%)	5(10.6%)	
	Snellen chart	1(2.1%)	5(10.6%)	
Contrast sensitivity function assessment	Hiding Heidi peddles	4(8.5%)	0(0.0%)	0.28
	Lea symbol CS chart	3(6.4%)	3(6.4%)	
	Lea number CS chart	4(8.5%)	1(2.1%)	
	Pelli Robson chart	19(40.4%)	8(17.0%)	
	Never checked	2(4.2%)	3(6.4%)	
Color vision assessment	Ishihara test	14(29.8%)	11(23.4%)	0.24
	Matching test	0(0.0%)	0(0.0%)	
	D-15 test	12(25.5%)	2(4.2%)	
	PV-16 test	5(10.6%)	2(4.2%)	
	never checked	1(2.1%)	0(0.0%)	
Visual field assessment	Finger mimicking	2(4.2%)	0(0.0%)	0.34
	Confrontation test	24(51.0%)	9(19.1%)	
	By using perimetry	3(6.4%)	3(6.4%)	
	By using amsler grid	1(0.0%)	0(0.0%)	
	Never checked	2(4.2%)	3(6.4%)	

TABLE 1: Techniques (methods and charts) which are used by optometrists and ophthalmologists for visual assessment. (N=47)

DISCUSSION

Most of the participants (optometrists or ophthalmologists) of my research have awareness about the protocols and techniques for visual assessment of children with various disabilities. Participants were given a questionnaire to assess quality of clinical service they provide irrespective of age, gender or the domain of their work in eye-care providing units. On the basis of their responses, they seemed quite comfortable while dealing and managing the ethical dilemmas related to children with various disabilities in their practice just like the studies done at Pleven university hospital.[12] They have fair knowledge about dealing with such children similar to the study done at urban public teaching hospital.[12]

Unlike the study conducted in Nigerian teaching hospital, most of them have dealt with children with various disabilities and they do follow medical ethical codes while performing clinical procedures on such children during their practice at their work place.[13]But a few of them need thorough awareness about these codes and as per need they introduced ethical module in their medical colleges for proper training of eye-care professionals in this regard just as previous studies indicated.[14]

Most of the participants responded that they provide comfortable environment for children with disability to ensure their full participation in the process of visual assessment. Unlike the study which indicated confidentiality breaches in various hospitals, this study indicated that the respondents are sincere about maintaining the confidentiality of children's medical records unless urgently needed to break it for child's own good.[15]Like studies done previously principle of autonomy is respected and followed by the participants.[16]Participants responded that they explain procedure before performing visual assessment. They avoid showing unnecessary sympathy to the child which make them feel inferior.

A few of respondents responded that they interrupt children with disability while they are explaining their medical complaints due to some unrevealed reasons but most of them responded that they try to avoid interrupting them to get proper information about the medical complain of the child. There was a moderate level of awareness about informed consent among the participants unlike the previous studies.[17]

About involving parents or guardians of the child to convey their message, most of the respondents responded positively. They responded that they involve guardian to increase participation of child in visual assessment. They also avoid exaggerated mouth movements during assessment. But most of them use sign language or non-verbal ways to communicate with children having any hearing or speech disorder unlike the

study conducted in Changi general hospital.[18] Respondents do check previous medical records and most of them also see child's pupillary reaction to identify other ocular pathologies. Responses to the application of OKN test to check blindness in children is poor, a few of participants perform OKN test during assessment.

Most of the participants use ETDRS chart, Snellen and lea number charts for the visual acuity assessment. A few of them use lea symbol and kays picture chart to check visual acuity in children with various disabilities. To assess the contrast sensitivity function, most of the participants use pellirobson chart, some of them use lea symbol contrast sensitivity chart, lea number contrast sensitivity chart and hiding Heidi paddles. A few of them have never checked contrast sensitivity in children with various disabilities.

For the assessment of color vision, most of the respondents use ishihar color vision test and D-15 test or PV-16 test. A few of them never checked color vision function in children with various disabilities during the visual assessment. Most of the participants responded that they use confrontation method for the assessment of visual field. Some measure the field of vision by using perimetry and finger mimicking. A few of them never checked the visual field in children with various disabilities during their visual assessment.

CONCLUSION

Eye-care professionals have fair knowledge about these protocols and techniques but a minor disconnect exists in the implementation of this knowledge while doing visual assessment of the children having disabilities in their clinical practice.

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