

## Girls' Adjustment with Blindness

Omnia Ragab Mohamed<sup>(1)</sup>, Seham Guirguis Ragheb<sup>(2)</sup>, Wafaa Khalil Ibrahim<sup>(3)</sup>

Faculty of Nursing- Ain Shams University-Cairo-Egypt.

### Abstract

**Background:** *Childhood blindness* refers to a group of diseases and conditions occurring in childhood or early adolescence. Blindness is a significant public health problem that affects the health, economic well-being, and productivity of individuals, families, and society as a whole. **Aims:** the aim of this study was to assess girls' adjustment with blindness. **Design:** A descriptive design was used to this study. **Setting:** the study was conducted at two schools for blind girls in Cairo and Mansoura cities, Egypt. **Sample:** purposive sample (47 in Cairo school and 66 in Mansoura School) were included in the study for a total sample of 113 girls. **Tools:** The data were collected using a structured interviewing questionnaire form. The tool consisted of 8 parts: socio-demographic data for girls, the details of girl's blindness history, medical history of girls', menstrual history, assess girl's knowledge of blindness, girl's health problems, assessment of girl's practices towards daily living activities & assessment of girl's adjustment towards blindness. **Results:** the mean age of the studied girl's was  $14.5 \pm 1.8$ , 46% of the studied girls were blind since birth, that 87.6% of studied girls' had unsatisfactory level of knowledge regarding blindness, 64.6% of the studied girls had high total adjustment. **Conclusion:** There was no statistically significant relation between socio-demographic characteristics and level of girls with blindness knowledge. There was statistically significant relation between total adjustment and Daily living activities independence level. There was no statistically significant relation between activities of daily living and level of girls with blindness knowledge. **Recommendations:** Early detection strategies of cases to avoid vision loss specially that most of causes can be treated, Encourage girls with blindness to participate in social life.

**Keywords:** Blindness, Adjustment.

### Introduction

Adolescence is the most turbulent period of life that has a crucial importance for identity formation. Persons who lost their sight at birth or later underwent extensive perceptual, behavioral, cognitive, and emotional changes in their life but not to the same extent (Ivanova et al., 2019).

Blindness is a significant public health problem that affects the health, economic well-being, and productivity of individuals, families, and society as a whole. The focus of population health approaches to eye and vision health should be on creating the conditions in which people can have the fullest capacity to see and that enable individuals to achieve their

full potential. Despite evidence that vision impairment increases the risk of mortality and morbidity from other chronic conditions and related injuries and is associated with a reduced Quality of Life (QOL), eye and vision health is not adequately recognized as a population health priority, so public health action has been extremely limited (Bastable, 2016).

Blind adolescents have a harder time with finding independence. They have to depend more on others to get where they want to go. Sighted adolescents can go off on their own. It is important for blind adolescents to feel independent. With the feeling of independence come a higher self-esteem and a better sense of identity. Blind adolescents those have high self-esteem

and a strong sense of identity have an easier time adapting to their environments than those with low self-esteem and a weaker sense of identity (Amato et al., 2013).

Adjustment is described as the process of responding to life's demands and stresses. People differ greatly in their ability to tolerate stressful experiences and many external factors, such as age, gender, formal and informal support systems, and internal factors like personality which thought to influence adjustment (Baarah et al., 2018).

### **Significance of the study**

According to the World Health Organization W-H-O, there are more than 2.2 million people with visual impairment in Egypt and 1.4 million are children below age 15 have irreversible blindness & need access to vision, rehabilitation services to optimize functioning & reduce disability Considering strained resources for people with visual disability, it is important to study the various factors that could help them to adjust well. This study was conducted to assess the adjustment to vision loss in adolescent girls. And understanding the factors impacting their adjustment might give a direction to redesigning the existing rehabilitation services.

### **Aim of the study**

The aim of the study was to assess girls' adjustment with blindness through:

1. Assessing girls' knowledge related to blindness;
2. Assessing girls' health problems related to blindness;
3. Assessing girls' health practices toward activities of daily living;
4. Assessing girls' adjustment with blindness

### **Research questions:**

1. Is there a relation between blind girls' health problems and their adjustment?
2. Is there a relation between knowledge of blind girls' and their practices toward their activity of daily living?
3. Is there a relation between blind girls' practices toward activities of daily living and their adjustment related to blindness?

### **Subjects and Methods**

#### **I-Technical Design:**

##### **Research Design**

Descriptive design was utilized for the current study.

##### **Research Setting:**

The study was conducted in two schools for blind girls in Cairo and Mansoura cities, Egypt.

##### **Sampling:**

##### **Sample size and characteristics:**

A purposive sample (47 in Cairo school and 66 in Mansoura school) were included in the study for a total sample of 113 girls.

##### **Inclusion criteria**

1. Girls' with acquired or congenital blindness at age between 12-18.
2. Enrolled in preparatory or secondary educational phase;
3. Residing or not residing in school.

##### **Tools of data collection:**

Data was collected through the following tool:

**Tool 1: Interviewing questionnaire:** This tool designed and developed by researcher it was written in a simple Arabic language after

reviewing the related scientific literature in the form of closed ended questions. It consisted of eight parts as the following:

▪ **Part 1:** This was for collection of the demographic data for girls such as age, school year, residence, birth order, siblings, etc.

▪ **Part 2:** This part assessed the details of girl's blindness such as onset time, mode, cause, degree, and family history, and management of the problem by use of eyeglasses, treatment, surgery, and follow-up.

▪ **Part 3:** This part asked about medical history of chronic diseases, physical illness, medications, and disability.

▪ **Part 4:** This was dedicated for girl's menstrual history such as age at menarche, cycle and period durations, and menstrual hygiene.

▪ **Part 5:** This part was intended to assess girl's knowledge of blindness definition, causes, risk factors, prenatal factors, and prevention. It consisted of five Multiple Choice Questions (MCQ).

❖ **Scoring:** For each knowledge question, a correct response was scored 1 and the incorrect zero. The scores of the questions were summed-up and the total divided by the number of the items, giving a mean score for the part. This was converted into a percent score. Knowledge was considered satisfactory if the percent score was 50% or more, and unsatisfactory if less than 50%.

▪ **Part 6:** This part assessed girl's health problems, including physical, cognitive & educational, social & psychological health problems.

○ Physical (14 items): such as fatigue, nausea, allergy, etc.

○ Learning (14 items): such as inability to concentrate, academic failures, etc.

○ Social (8 items): such as feeling of loneliness, difficulty dealing with others, etc.

○ Psychological and behavioral (11 items): such as moodiness, nervousness, aggressive behavior, etc.

❖ **Scoring:** The responses to each problem of the four domains was either "yes" or "no." These were scored one for yes response & zero for no. The total score of each domain and for the total scale was calculated by simple summation. The girl was having health problems in each domain if the total score was >0. This was also applied to the total scale score. The health problems according to the study 83.2% of the studied girls had learning problems, 71.7% had physical problems. While, 66.4% had psychological problems & 42.5% had social problems.

**Part 7:** This part assessed girl's practices of daily living activities include: personal hygiene practices such as showering, brushing teeth, etc. It also assessed health practices such as breast self-examination, exercise, and sleep, as well as the practice of hobbies and participation in school activities and trips. Lastly, it asked about independence in the Activities of Daily Living (ADLs) such as clothing, feeding, mobilizing, and housekeeping. This was modified from **Stillman (1974)**.

❖ **Scoring** of independence in ADLs: The responses to the items were on a 3-point Likert type scale: "dependent/partially independent/ independent." These were scored from one to three. The total score of the five ADLs was calculated and converted into a percent score. The girl was considered dependent if the total score was <60%, and independent if 60% or higher.

▪ **Part 8:** This was for assessment of girl's adjustment towards blindness. It was

modified from **Linkowski and Dunn, (1974)**. It consisted of 33 items with a 4-point Likert type scale: “strong agree/agree/ disagree/ strong disagree.” These are categorized into three domains of coping:

- Physical (12 items) such as: “my disability prevents me from mobilizing easily,” etc.
- Psychological (10 items) such as: “my disability annoys me so that I cannot enjoy anything,” etc.
- Social (11 items) such as: “my disability has limited my social relations,” etc.

❖ **Scoring:** The items checked strong agree/ agree/ disagree/strong disagree were scored from 3 to zero, respectively. For each domain and for the total scale, the scores of the statements were summed-up and the total divided by the number of the statements, giving a mean score for the part. These scores were converted into percent scores. The girl’s adjustment was considered high adjustment if the percent score was 60% or more, and low adjustment if less than 60%.

### **Tool Validity & Reliability**

Face and content validity of the study tools was assessed by group of 5 experts in nursing department faculty of nursing, Ain-Shams University for comprehensiveness, accuracy and clarity in language Reliability done by using the Cronbach Alpha coefficient 0.735.

### **Operational Design**

**The operational design of the study entails three main phases:**

#### **A- Preparatory phase**

This phase include review of the past and current national and international related literature using articles, journals,

scientific periodicals and text books and online reference was conducted to develop the study tools under the supervisor guidance to get acquainted with the various aspects of the research questions.

#### **B- Pilot Study**

A pilot study was carried out on 10% of the total sample size. It was conducted to test the clarity and applicability of the study tool and the time required for the interview. Since no modification was needed in the data collection tool, the girls in the pilot study were included in the main study sample.

#### **C- Field Work**

After securing all the necessary permissions, the researcher visited the study settings and met with the director of each school to schedule the proper time for data collection. Then, met with the blind girls individually, introduced herself, gave a brief explanation of the nature and aim of the study, and obtained an oral informed consent for participation.

Each girl was interviewed individually after agreeing to participate. The interviews were conducted at school library. All safety precautions for COVID-19 (hand washing, use of sanitizers, wearing face mask, and social distancing) were applied to prevent infection. During the interview, the researcher tried to facilitate the understanding of any confusing or difficult questions.

The interview for each girl took 20-30 minutes. The fieldwork lasted over a period of 4 months. It was started at the beginning of February 2019, but was stopped because of COVID-19 quarantine. Then, it was resumed after the return of study at schools. The researcher was available in the study settings 3 days/week, Sunday to Tuesday from 8.00 am to 1.00 pm. On average, 6-8 girls were interviewed per day.

## II- Administrative Design

An official permission was sent to the Director of central organization for packing and counting and also an official permission was sent to security director at ministry of education to conduct the study, then was submitted for administrators of previously mentioned setting, concerned the title objective, study technique and tools seeking for their co-operation total confidentiality of any obtained information was ensured.

Official permission to conduct the study were obtained from the Central Agency for Public Mobilization and Statistics (CAPMAS), and the Security Director at Ministry of Education, and the Security Directors of Cairo and Dakahlia Education Departments. These were obtained based on letters issued from the Dean of the Faculty of Nursing, Ain-Shams University, explaining the aim of the study, and with a copy of the interview form enclosed. Based on this, official approvals were sent to the director of each school.

### Ethical considerations:

Approval from Scientific Research Ethical Committee Faculty of Nursing Ain Shams University & Verbal approval was obtained from the girls' before inclusion in the study; a clear and simple explanation will give according to their level of education. They were assured that all the gathered data will be treated confidentially and used for research purpose only and that they have the right to withdraw from the study at any time without giving any reason.

## III- Statistical analysis

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics in the form of

frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the coping scale through its internal consistency. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. In order to identify the independent predictors of the knowledge, problems, independence, and coping scores multiple linear regression analysis was used and analysis of variance for the full regression models was done. Statistical significance was considered at p-value <0.05.

### Result:

**Table (1):** reveals that 50.4% of the studied girls were less than 15 years old with mean and standard deviation  $14.5 \pm 1.8$ . In addition, 18.6% were at prep 1 grade and 18.6% at secondary 3. While, 52.2% were at preparatory school phase. Also, 71.7% were from urban areas. 98.2% had siblings and 50.4% were at first birth orders.

**Table (2):** demonstrates that 89.4%, 32.7% and 24.8% of the studied girls had a correct answer regarding causes, risk factors and prevention of blindness respectively. 87.6% of them had unsatisfactory level of knowledge.

**Figure (1):** reveals that 83.2% of the studied girls had learning problems, 71.7% had physical problems. Meanwhile, 66.4% had psychological problems compared to 42.5% had social problems.

**Table (3):** presents that 61.1% and 78.8% of the studied girls regarding independence in personal hygiene and

eating respectively. Meanwhile, 75.2% of the studied girls were independent as total.

**Table (4):** presents that 45.1% of the studied girls had high physical adjustment. 82.3% had high psychological adjustment. In addition, 53.1% had high social adjustment. Lastly. 64.6% of the studied girls had high total adjustment.

**Table (5):** clarifies that there was no statistically significant relation between activities of daily living and level of girls with blindness knowledge.

**Table (6):** reveals that there was statistically significant relation between physical adjustment and DLAs independence. Adding to that, there was statistically significant relation total adjustment and DLAs independence

**Table (7):** reveals that there was highly statistically significant relation between having social problems and adjustments. Besides, there was statistically significant relation between having learning problems and adjustment.

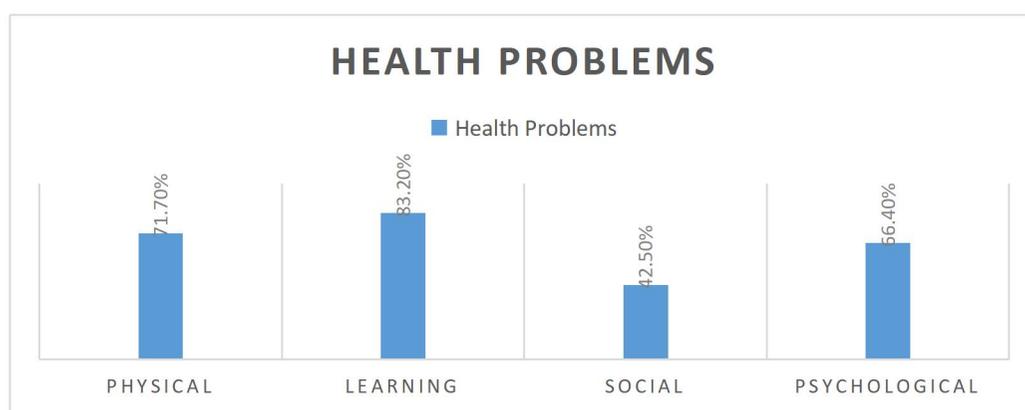
**Table (1):** Distribution of the girls' with blindness according to their demographic characteristics. (n=113).

	No.	%
Age:		
<15 years	57	50.4
15+years	56	49.6
Mean $\pm$ SD		14.5 $\pm$ 1.8
Educational grade:		
Prep. 1	21	18.6
Prep. 2	18	15.9
Prep. 3	20	17.7
Sec. 1	16	14.2
Sec. 2	17	15.0
Sec. 3	21	18.6
School phase:		
Preparatory	59	52.2
Secondary	54	47.8
Residence:		
Urban	81	71.7
Rural	32	28.3
Have siblings:		
No	2	1.8
Yes	111	98.2
Birth order:		
1	57	50.4
2+	56	49.6

**Table (2):** Distribution of girls with blindness related to their correct score level of knowledge about visual loss.(n=113).

Correct knowledge about blindness	No.	%
Definition	3	2.7
Causes	101	89.4
Risk factors	37	32.7
Prenatal factors	9	8.0
Prevention	28	24.8
Total knowledge:		
Satisfactory ( $\geq 50\%$ )	14	12.4
Unsatisfactory ( $< 50\%$ )	99	87.6

(@) Not mutually exclusive



**Figure (1):** Total health problems as reported by girls with blindness (n=113).

**Table (3):** Total Distribution of Girls with blindness related to their independent level towards Daily Living Activities (DLA) practices as reported by girls in the study sample (n=113).

	No.	%
Independent in:		
Personal hygiene	69	61.1
Clothing	24	21.2
Eating	89	78.8
Mobilizing	25	22.1
Housekeeping	37	32.7
Total:		
Dependent	28	24.8
Independent	85	75.2

(@) Not mutually exclusive

**Table (4):** distribution of girls related to their high level of adjustment towards blindness in the study sample (n=113).

Items	No.	%
High (60%+) adjustment:		
Physical	51	45.1
Psychological	93	82.3
Social	60	53.1
Total adjustment:		
Low	40	35.4
High	73	64.6

**Table (5):** Relations between girls' with blindness knowledge and their practices in DLAs.

Activities of Daily living	Knowledge				X <sup>2</sup> test	p-value
	Satisfactory		Unsatisfactory			
	No.	%	No.	%		
Personal hygiene:						
Dependent	10	14.5	59	85.5		
Independent	4	9.1	40	90.9	0.72	0.40
Clothing:						
Dependent	4	16.7	20	83.3		
Independent	10	11.2	79	88.8	Fisher	0.49
Eating:						
Dependent	10	11.2	79	88.8		
Independent	4	16.7	20	83.3	Fisher	0.49
Mobilizing:						
Dependent	5	20.0	20	80.0		
Independent	9	10.2	79	89.8	Fisher	0.30
Housekeeping:						
Dependent	2	5.4	35	94.6		
Independent	12	15.8	64	84.2	Fisher	0.14
Total:						
Dependent	2	7.1	26	92.9		
Independent	12	14.1	73	85.9	Fisher	0.51

**Table (6):** Relations between girls' with blindness independence in DLAs and their adjustment towards blindness.

Adjustment	DLAs independence				X <sup>2</sup> test	p-value
	Dependent		Independent			
	No.	%	No.	%		
Physical adjustment:						
Low	22	35.5	40	64.5		
High	6	11.8	45	88.2	8.45	0.004*
Psychological adjustment:						
Low	7	35.0	13	65.0		
High	21	22.6	72	77.4	Fisher	0.26
Social adjustment:						
Low	15	28.3	38	71.7		
High	13	21.7	47	78.3	0.66	0.41
Total adjustment:						
Low	16	40.0	24	60.0		
High	12	16.4	61	82.6	7.70	0.006*

(\*) Statistically significant at p&lt;0.05

**Table (7):** Relations between girls' with blindness health problems & their adjustment towards blindness (n=113).

Health Problems	Adjustment				X <sup>2</sup> test	p-value
	Low		High			
	No.	%	No.	%		
Have chronic diseases:						
No	38	35.8	68	64.2		
Yes	2	28.6	5	71.4	Fisher	1.00
Have physical illness:						
No	35	35.7	63	64.3		
Yes	5	33.3	10	66.7	0.03	0.86
On medication:						
No	38	35.5	69	64.5		
Yes	2	33.3	4	66.7	Fisher	1.00
Age at menarche:						
<12	25	38.5	40	61.5		
12+	14	31.1	31	68.9	0.63	0.43
Anxious about adolescence:						
No	22	40.0	33	60.0		
Yes	18	31.0	40	69.0	0.99	0.32
Have physical problems:						
No	30	37.0	51	63.0		
Yes	10	31.3	22	68.8	0.34	0.56
Have learning problems:						
No	38	40.4	56	59.6		
Yes	2	10.5	17	89.5	6.18	0.01*
Have social problems:						
No	29	60.4	19	39.6		
Yes	11	16.9	54	83.1	22.84	<0.001*
Have psychological problems:						
No	31	41.3	44	58.7		
Yes	9	23.7	29	76.3	3.44	0.06
Total problems:						
Yes	38	35.5	69	64.5		
No	2	33.3	4	66.7	Fisher	1.00

(\*) Statistically significant at  $p < 0.05$

## Discussion

Regarding socio demographic for girls with blindness, the current study revealed that more than half of girls were less than 15 years old. In addition, more than half of them were at preparatory school phase. Majority of girls had siblings and more than half of them were at first birth orders This result was in agreement with **Verdier et al., (2018)** who studied girls with blindness—major causes, developmental outcomes and implications for habilitation and educational support in Swedish, and found that study sample were

at preparatory school phase, had blindness. Also, this result was supported with **Ivanova et al., (2019)** who studied girls with complete congenital stationary night blindness in Russian, and found that more than half of them were at first birth orders.

Regarding girl's level of knowledge about visual loss one third of the studied girls had a correct answer regarding causes, risk factors and prevention. This result was accordance with **Byanju et al., (2019)** who studied the childhood blindness and visual impairment in the Narayani, and found that majority of participants had low level of

knowledge about blindness. On the other hand, this result was congruent with **McGuire et al., (2019)** who studied the prevalence of cerebral palsy, intellectual disability, hearing loss, and blindness, and found that more than half of participants had correct answer about knowledge of blindness.

Regarding total distribution of girls with blindness related to their independent level towards Daily Living Activities (DLA) practices of girls, the current study presented that the highest percentage of the studied girls regarding independence in personal hygiene and eating. This result was in agreement with **Verdier et al., (2018)** who studied the challenges and successful pedagogical strategies: Experiences from six Swedish students with blindness in different school settings, and found that majority of participants were independent on others in daily activities. Conversely, this result was in disagreement with **Ivanova et al., (2019)** who studied the girls with complete congenital stationary night blindness in Russian, and found that majority of girls were dependent on their mothers in daily activities.

Regarding their high adjustment towards blindness, nearly two thirds of the studied girls had high total adjustment. This result was supported by **Nazeer et al., (2019)** who studied the color vision deficiency in medical students in India, and found majority of participants had high level of total adjustment about color vision deficiency.

Regarding Relations between girls' with blindness knowledge and their practices in DLAs, the current study clarified that there was not statistically significant relation between activities of daily living and level of girls with blindness knowledge. This result was

accordance to **Gilbert et al., (2021)** who studied the childhood blindness and visual impairment in South-East Asia and found that there was no statistically significant relation between student's daily living activities and their demographic characteristics. On the other hand, this result was supported by **Onuigbo et al., (2020)** who studied the predictive influence of irrational beliefs on self-esteem of preparatory students with late blindness, and found that there was statistically significant relation between student's daily living activities and their demographic characteristics

Regarding Relations between girls' with blindness independence in practices of DLAs and their adjustment towards blindness, the current study revealed that there was statistically significant relation between physical adjustment and DLAs independence. Adding to that, there was statistically significant relation between total adjustment and DLAs independence. This result was supported by **Nazeer et al., (2019)** who studied the color vision deficiency in medical students in India, and found majority of participants had improvement in adjustment with daily living activities.

Regarding Relations between girls' with blindness health problems & their adjustment towards blindness, the current study revealed that there was highly statistically significant relation between girls' having social problems and adjustments. Besides, there was statistically significant relation between having learning problems and adjustment. This result was supported by **López et al., (2021)** who studied the Causes of Blindness and Visual Impairment in Early Childhood at a Low Vision Service in Mexico City: A 15-year, and found that majority of participants had problems and improve with adjustment.

### Conclusion

The current study concluded that there was statistically significant relation between age and status of daily living activities independence. There was no statistically significant relation between activities of daily living and level of girls with blindness knowledge about blindness. Also there was statistically significant relation between physical adjustment and Activities of daily living independence. Adding to that, there was statistically significant relation between total adjustment and DLAs independence. The study clarifies that there was highly statistically significant relation between girls' having social problems and adjustments. Besides, there was statistically significant relation between girls' having learning problems and adjustment.

### Recommendation

In the light of these findings it was recommended that:

- Early detection strategies of cases to avoid vision loss specially that most of causes can be treated, by developing comprehensive eye-health programmes at national and subnational levels, collaboration and coordination between stakeholders involved in preventing avoidable blindness.
- Training programs that include essential skills the girls' need to work competitively and live independently including skills to help to travel alone, to gain confidence to live successfully and pursue their professional goals. Also they should have rehabilitation programs that help them practice new skills related to emotions, communication, lifestyle and goals.
- Repeat this study on large number to generalize the results in different governorates.

### References

- Ahnou-Zabsonre, A., Meda, R., Diallo, J.W., Djigumde, W. P., Sanou, J., Meda-Hien, G., ... & Diomandé, A. (2020).** Causes of childhood blindness and visual impairment in Ouagadougou: About 398 cases. *Journal Francais d'Ophthalmologie*.
- Amato, S., Hong, S. & Rosenblum, L. P. (2013).** The abacus: Instruction by teachers of students with visual impairment. *Journal of Visual Impairment & Blindness*, 107, 262-272.
- Baarah, B.T., Shatnawi, R.A. & Khatatbeh, A.E. (2018).** Causes of permanent severe visual impairment and blindness among Jordanian population. *Middle East Afr J Ophthalmol*; 25:25-9
- Bastable, S.B. (2016).** Essentials of patient education. 2nd ed. Burlington, MA: Jones and Bartlett.
- Byanju, R. N., Kandel, R. P., Sharma, P., Thapa, H. B., Shrestha, M. & Bassett, K. (2019).** Childhood blindness and visual impairment in the Narayani zone of Nepal: a population-based survey. *Ophthalmic epidemiology*, 26(4), 257-263.
- Gilbert, C., Vijayalakshmi, P., Bhaskaran, S., Udupihille, T., Muhiddin, H. S., Windy, D. A., ... & Islam, K. (2021).** Childhood Blindness and Visual Impairment. In *South-East Asia Eye Health* (pp. 169-195). Springer, Singapore.
- Ivanova, M.E., Zolnikova, I.V., Gorgisheli, K.V., Atarshchikov, D.S., Ghosh, P. & Barh, D. (2019).** Novel frameshift mutation in NYX gene in a Russian girls with complete congenital stationary night blindness. *Ophthalmic genetics*, 40(6), 558-563.
- Linkowski & Dunn, (1974).** "Self –concept and acceptance of disability", *Rehabilitation counseling Bulletin*, 17, 28-32.
- López Ulloa, J. A., Burn, H. & Beauregard, A. M. (2021).** Causes of Blindness and

- Visual Impairment in Early Childhood at a Low Vision Service in Mexico City: A 15-year Review. *Ophthalmic Epidemiology*, 1-8.
- McGuire, D. O., Tian, L. H., Yeargin-Allsopp, M., Dowling, N.F. & Christensen, D. L. (2019).** Prevalence of cerebral palsy, intellectual disability, hearing loss, and blindness, National Health Interview Survey, 2009–2016. *Disability and health journal*, 12(3), 443-451.
- Nazeer, M., Bashir, S., & Rafiq, N. (2019).** **Color Vision Deficiency in Medical Students in Jammu & Kashmir, India.** *Галицький лікарський вісник*, (26, число 1), 23-26.
- Onuigbo, L.N., Onyishi, C.N. & Eseadi, C. (2020).** Predictive influence of irrational beliefs on self-esteem of preparatory students with late blindness. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 38(4), 472-497.
- Rideaux, K.S. & Pérez, M.S. (2019).** Countering Color-Blindness in Early Childhood Education: Elevating the Embodied Experiences, and Perspectives. In *Educating for social justice in early childhood* (pp. 20-33). Routledge.
- Stillman, R. (1974):** The callier –Azusa scale. Callier center for communication disorder, Dallas, Texas.
- Verdier, K., Ulla, E., Löfgren, S. & Fernell, E. (2018).** Girls with blindness—major causes, developmental outcomes and implications for habilitation and educational support: a two-decade, Swedish population-based study. *Acta ophthalmologica*, 96(3), 295-300.