

## Biological and psychological impact of stress on blind children at Benha city

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### Abstract

World Health Organization (WHO) has proposed the following definition for blindness.” A physical, psychiatric, intellectual or sensory impairment, whether temporary or permanent, provided that it lasts for a significant period of time, that limits the capacity to perform one or more essential activities of daily life and which can be caused or aggravated by economic and social environment”, also Visual impairment had a greater impact on social relationships according to its severity and onset and self-concept and social adjustment of children and adolescents. The aim of this work is to Find out degree of stress and its impact among blind and visually impaired children and adolescents in Benha city. Students of El-Noor school for blind at Benha city , in Qalyubia governorate in Egypt ,both sexes aged 6 to 20 years and having vision below 3/60 were included. Those with comorbid deafness/dumbness or other physical disability were excluded. Tools were Ethical approval was obtained from the Institute’s ethical committee and students and informed consent was taken from the concerned authorities the schools as well as the respective guardians, Socio-demographic data.

**Keywords:** Stress, Blindness, Adjustment, Cortisol.

### 1. Introduction

Stress in human life is often equated with tension, anxiety, worry and pressure. Chronic renal failure is threatened with many potential losses and changes in lifestyle. In the initial stages a patient may need only rest and dietary restrictions but as the disease progresses, the patient physically may not be able to cope up with his work and hence take medical leave for hospitalization to reduce his working hours or even may refrain from going to work that may affect the whole family, especially if the patient is the breadwinner [1]. Blindness is one of the most of significant social problem in India. It is estimated that there is an annual incidence of 2million cataract induced blindness in the country. According to WHO there are over forty million people worldwide whose vision is worse, 80%of whom live in developing countries. Half of the blind population in the United States is over 65years of age. Blind and visual disability is a great problem all over the world. Loss of the visual acuity in children requires special attention. Visual impairment is an important cause of developmental disability among children, if these are undetected or untreated can have substantial long-term implications for the quality of the life of the child and the family and also can place the burden on public health resources [2].

Adjustment refers to the psychological process through which people manage or cope with the demands and challenges of everyday life ( Pandey 2018) [3].

The good communication and positive societal interaction foster relationships and emotional adjustment, but for a visually impaired child, these

channels are blocked, sometimes resulting in emotional instability (Pradhan 2010) [4].

Psychological hardiness Refers to the three interrelated personality characteristics known as commitment, control and challenge, which together appear to protect individuals from the negative health effects of stress. Links between hardiness and healthy stress coping have been well documented, Knowledge about who will show a more resilient and adaptive response to stress can be beneficial in recruitment and selection to professions or positions prone to stress. For the present study, we were unable to examine high-vs. Low-hardiness groups, since all subjects scored in the high-hardiness range [4].

cortisol is a key player in the stress response, in the presence of a physical or psychological threat, cortisol levels surge to provide the energy and substrate necessary to cope with stress-provoking stimuli or escape from danger. However, although a stress-induced increase in cortisol secretion is adaptive in the short-term, excessive or prolonged cortisol secretion may have crippling effects, both physically and psychologically [5].

### 2. Patients and methods

El-Nour boarding school for blind children and adolescents at Benha city, in Qalyubia governorate in Egypt ,both sexes aged 6 to 16years and having vision below 3/60 were included there was 90 child were included in our study 30 were visually impaired in residential care(staying in the school 6 days or more in the school) 30 return to their home daily as usual, and 30 control from normal schools. Those

with comorbid deafness/dumbness or other physical disability were excluded. Tools :

### 1. Battery measuring indicators of mental health in visually impaired people(15) Composed of 4 main scales :

1. psychological and social adjustment 35 question.
2. self-esteem 40 question
3. psychological hardiness 23question
4. sense of haPP.iness 31 question

The rating points of 1 to correspond to incremental levels of symptom severity: • A rating of 1 (low) denotes questionable or subtle or suspected low level of mental health and adaptation. • A rating of 2 (medium) denotes questionable or subtle or suspected medium level of mental health and adaptation. • A rating of 3 (high) denotes questionable or subtle or suspected high level of mental health and adaptation.

### 2. Salivary cortisol level

Procedure of saliva collection: To avoid an increase in cortisol concentration and contamination of the oral cavity due to food intake or smoking , the test subjects were instructed not to eat, drink or smoke later than 60 minutes before the samples were collected. The subjects were not allowed to expose themselves to physical strain later than 60 minutes before sampling and they were instructed to rest lying down during the last 30 minutes. Brushing of the teeth was not allowed during the 60 minutes preceding saliva collection to minimize the risk of blood contamination. The mouth was to be rinsed with water 15 minutes prior to saliva collection, two samples were aPP. lied morning(6-7 am) and evening sample(8-9pm) .

### 3. Statistical Analysis

The data was analyzed using Statistical Package for Social Science version 20 (SPSS Inc., Chicago, IL, USA). Parametric data were expressed as mean  $\pm$  standard deviation and nonparametric data were expressed as numbers and percentages of the total. Comparisons of the each scale with cortisol level were done, mean  $\pm$  standard deviation were done using the paired *t*-test. A *P* value of  $P \leq 0.05$  was considered statistically significant.

### 4. Results

**Table (1) shows enrolls 30 student male, 30 females** , with a mean age of 6-10y, 28(46.7), 11-13y 14(23.3), 14-16y 18(30) years (range 6–16 years). The mean duration of visual impairment was 10.34 (3.73) years , and the mean visual impairment congenital 44(73.3%), acquired 16( 26.7%).

Table (2) shows comparison of The mean and standard of residential care group and in day only care group we found according to the battery there is a highly significant relation with psychological hardiness scale.

Table (3) shows correlation of salivary cortisol am there a negative relation with social and psychological adjustment, and sense of haPP.iness, also negative relation of significance with self -esteem but positive relation with psychological hardiness.

Table (4) shows correlation of salivary cortisol pm there a negative relation with social and psychological adjustment ,and sense of haPP.iness and psychological hardiness ,also negative relation of significance with self -esteem.

### 5. Discussion

The aim of the study to detect the effect of certain life stressors and blindness as a major disability in visually impaired children and adolescent in comparison with sighted ones by investigating the indicators of mental health parameters for blind (social and psychological adjustment, self-esteem , psychological hardiness, and sense of haPP.iness scales) and psychiatric morbidities with it, and detecting its significance in relation to salivary cortisol level(AM,PM).we found that when the cause for impairment was analyzed among the students, nearly half of the visually impaired respondents 29 (48.3%) were blind due to inborn deformities or acquired cause. In general, the data revealed the prevalence of medium levels of social and psychological adjustment, self -esteem, psychological hardiness, sense of haPP.iness scales as an indicator of mental wellbeing, but the prevalence of psychiatric morbidity after was (n=23)38.3% of 60 visually impaired child ,psychiatric morbidity with preeminence of internalizing disorders, depression was 12(20%), generalized anxiety disorder was 7(11.7%), but externalized behavior was in form of ODD 14 (23.3%), with no conduct cases.in comparison with sighted children (control= 30) depression was 3(10%) anxiety 2(6.7%), ODD 3(10%), with no conduct cases.

But ,Ethiopian study also found 4.7% psychiatric morbidity among visually impaired people with majority having internalizing disorders.

Likewise, an Indian study reported that 7% of blind subjects had psychiatric morbidity with preeminence of internalizing disorders[9].

In the current study there is psychological hardiness is more in boys than girls(in day sitting group), more in adolescents than younger ages, more in sighted than blind students ,more in congenital blind than acquired.

In residential care group psychological hardiness is more in girls than boys, more in younger age than in older (6-10),more in sighted ,more in congenital blind.

In our study we found that Self-esteem was lower among girls(36.7% of medium degree) with visual impairment than among boys(56.7% of medium degree) in in entry group, but in at home group self -esteem in girls (46.7%) higher than boys(36.7%) in medium degree.

It was confirmed that when there is an increase in anxiety and depression, there is proportionate increase in maladjustment or poor adjustment. The students stages did not have a significant relationship with the student's adjustment, internalized or externalized problems.

It could be deduced that most of the visually impaired students make appropriate social and psychological adjustments based on their level of depression. There was a significant relationship between adjustment and depression among the visually impaired subjects. In general, when there is an increased level of frustration (depression), there is an increase in maladjustment or poor adjustment.

The rate of adjustment (psychological and social) varies in accordance with the rate of aggression [6] Age did not have any major influence on psychological problems prevalent among the

respondents. There was a positive correlation between adjustment and anxiety level among visually impaired adolescents and the adjustment parameter did not have the same relationship with depression and aggression level among the respondents [6].

Gender of the visually impaired students does have a significant relationship with adjustment or psychiatric morbidities as anxiety, depression. The tendency of aggression among the male students might be due to the existence of a male dominant society. They have been conditioned knowingly or unknowingly to behave aggressively if their desires or interests or needs are not actualized. This assertion could be compared with the study on the impact of emotional maturity on stress and self-confidence of students, which projects that adolescent boys tend to have significantly higher stress than girls and girls tend to have significantly higher self-confidence [7].

Most of the visually impaired students with respect to their gender identity had increased or decreased levels of anxiety, aggression and adjustment. In contrary to the above findings, there was no significant gender difference with respect to psychological problems among visually impaired subjects[8].

**Table (1)** Socio-demographic and clinical characteristics of the visually impaired students (N=60)

Characteristic n (%)	Mean (SD)
Age (y)	6-10y 28(46.7)
	11-13y 14(23.3)
	14-16y 18(30)
Onset (y)	3.34 (2.16)
Duration (y)	10.34 (3.73)
sex	Male 30(50)
	Female 30(30)
Rural domicile	45(75)
Lower Socioeconomic status	35(58.3)
Visually impaired	Congenital 44(73.3)
	Acquired 16(26.7)
	Partial35(58.3)
Visual impairment disability	Complete25(41.7)
	30(50)
Staying in residential school	30(50)

**Table (2)** Shows distribution of Battery measuring indicators of mental health in visually impaired people among day care group, and residential group

Battery	In residential care	In day care	p-value
	No=30 mean±SD	No=30 mean±SD	
Psychological and social adjustment	67.3±7.3	67.1±5.3	0.9(insignificant)
Self-esteem	50.4±8.7	48.3±8.3	0.34(insignificant)
Psychological hardness	40.1±7.2	47.7±7.4	0.0002**(significant)
Sense of haPP.iness	45.4±6.4	45.9±6.5	0.77(insignificant)
Battery(total)	203.2±17.9	209.1±12.1	0.14(insignificant)

Table(3) shows Correlation of salivary cortisol Am level with the scales of the battery

Battery	salivary cortisol am	Correlation coefficient*(r)	P-value
Social and psychological adjustment scale		-.036	.787
self-esteem scale		-.273*	.035
psychological hardiness scale		.070	.595
Sense of haPP.iness scale		-.026	.843

Table(4) shows Correlation of salivary cortisol pm level with the scales of the battery

Variables pm	salivary cortisol	Correlation coefficient*(r)	P-value
Social and psychological adjustment		-.099	.351
Self-esteem		-.287*	.026*
Psychological hardiness		-.162	.216
Sense of haPP.iness		-.238	.067

**Conclusion**

There are many stressors that affect visually impaired children but they have large coping and adjustments that gave to them better living even with minimal help as in residential care students who are far from their families.

**Limitations**

The study group from one school so, the study done on them (close community) so it did not include the non educated or who not completed education ,or who are included in normal schools.

Cultural issues and religious issues are not considered as part of stress.

Difference between rural and urban in dealing with such disability.

In the study we studied family stressors in brief, we need more interviews with families and applying questionnaires.

Common finding (like ticks) not examined in details.

The results of our study can not be generalized to all visually impaired children, as subjects of this study were getting education in a school having a better support system. This highlights the need to include samples from general population.

**Recommendations**

Further studies in larger scale are recommended regarding number of patients. Further studies considering family stressors and cultural issues. Comparative studies that consider the cultural differences to detect the cultural impact on the outcomes i.e rural versus urban Egyptian versus Arabian's. Teaching caregivers how to find problems

and how to deal. Making programs to teach visually impaired children better coping with stressors. Along with a matched control group, a larger sample size, quality of life, disability and burden of various mental disorders, and follow-up studies to know the longitudinal course of the disorders. studying how we can integrate sighted ones in normal school. Difference between rural and urban patient in adjustment. We suggest that mental care should be balanced along with clinical care in order to decrease the distress outcomes. Family support system should be established and special workshops for parents of blind and low vision student should be conducted.

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