

# Assessment of Psychological and Psycho-physiological Problems Among Visually Impaired Adolescents

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## Abstract

**Background:** Visual impairment tends to evoke more discomfiture than any other disability. Primarily, the biggest issue may be that blindness is visible. Furthermore, visual impairment develops serious medical, psychological, social and economic problems.

**Objectives:** The focus of the current study was to investigate the psychological and psycho physiological problems of visually impaired adolescent students.

**Patients and Methods:** Purposive sampling was adopted to select 150 visually impaired students (71 males and 72 females) from five schools in Coimbatore city of the Tamil Nadu state, India. Anxiety, frustration, aggression and social and personal adjustment levels of the visually impaired students were measured in this study using Taylor's manifest anxiety scale, frustration test, aggression scale and the adolescent adjustment inventory, respectively.

**Results:** Anxiety ( $\chi^2 = 185.66, P = 0$  at  $P < 0.01$ ), frustration ( $\chi^2 = 167.23, P = 0$  at  $P < 0.01$ ) and aggression ( $\chi^2 = 57.66, P = 0$  at  $P < 0.01$ ) were significantly related to adjustment among visually impaired students. The adjustment score had a significant positive correlation with anxiety ( $r = 0.919, P = 0$  at  $P < 0.01$ ), frustration ( $r = 0.887, P = 0$  at  $P < 0.01$ ) and aggression levels ( $r = 0.664, P = 0$  at  $P < 0.01$ ), anxiety was significantly correlated with frustration ( $r = 0.961, P = 0$  at  $P < 0.01$ ) and aggression levels ( $r = 0.727, P < 0.01$ ) and frustration was significantly correlated with aggression level ( $r = 0.637, P = 0$  at  $P < 0.01$ ) of visually impaired adolescents. There was a positive relationship between psycho-physiological disorders and anxiety frustration, aggression and adjustment among visually impaired students.

**Conclusions:** Visually impaired students exhibited significant levels of psychological and psycho-physiological problems.

**Keywords:** Adjustment, Adolescence, Aggression, Anxiety, Frustration, Psycho-Somatic Disorders

## 1. Background

Visual impairment tends to evoke more discomfiture than any other disability. Primarily, the biggest issue may be that blindness is visible. Furthermore, visual impairment develops serious medical, psychological, social and economic problems. Thus, of most importance is improvement in prophylaxis, early diagnosis and treatment (1). The blind person is usually not the one who can easily weave himself into the fabric of a crowd. Unlike many other exceptional people, he stands out. We often do not realize that a person has impaired hearing until we talk to him. Likewise, the vast majority of mentally-challenged individuals are indistinguishable from others on the basis of physical appearance. A visually impaired person, however, has a variety of symbols like cane, thick or darkened glasses, a guide dog etc. "A legally blind person is said to be one (i) who has visual acuity of 20/200 or less in the better eye even with correction, (ii) or whose field of vision is so restricted that it subtends an angle of 20° or less in the better eye after correction".

Visual acuity is the ability of the eye to clearly see distant objects, which is determined with the help at Snellen's chart (2). Low vision is defined in terms of reduction in the clarity of vision, whereas partially sightedness is defined in terms of the distance through the Snellen's chart for educational purposes (3). The visual acuity of 20/200 refers to the fact that what a blind person can see at 20 feet a person with normal vision sees at 200 feet (normal visual acuity is 20/20). Personality problems are not inherent in the condition of blindness. If maladjustment does occur in a blind individual, it is more than likely due to the fact that society has treated him differently. In other words, it is society's reaction to the visually impaired person that determines his adjustment. A blind child suffers from behavioral deficiency because of extreme neglect or over-protection (3). Helplessness, tragedy, economic insecurity, fear of darkness etc., all these supposed concomitants of blindness, are experienced by the blind person with the full force of identification.

This shock causes withdrawal, extreme apathy, and suicidal ideas. The above feelings may create anxiety, frustration and maladjustment among visually impaired individuals (4). India's disabled population has increased by 22.4% between 2001 and 2011. The number of disabled, which was 22 million in 2001, rose to 26.8 million in 2011. Rural areas have more disabled people than urban areas. According to the 2011 Indian census, 20.3% of the disabled are movement disabled followed by hearing impaired (18.9%) and visually impaired (18.8%). Poverty is the most probable cause of disability in India because disabled people are more likely to suffer from malnutrition, live in crowded conditions, have limited access to medical care, be poorly educated, have not been immunized, had lacked adequate care during pregnancy and birth, and have mothers who had undergone multiple pregnancies (5). The inability of blind people to control their environment by sight has still another effect. They are frequently disturbed by a fear of being observed by others. A blind person, who cannot determine whether he is being observed, or when the observation begins or ends, feels that he must control his movements and his behavior, which produces a state of tension and self-consciousness and anxiety towards the society (6). It was observed that the effects of deafness i.e. auditory deprivation, which further leads to poor communication, are paramount. This can affect social, psychological and many other aspects of life. In spite of their impairment and communication difficulties, they are affected by adjustment problems in their personal and social life (7). Visually impaired people had a higher prevalence of depression compared with people with good vision. Of visually impaired older individuals, 13.5% were depressed compared with 4.6% of people with good vision (8). People with visual impairment are more likely to experience problems with functioning, which in turn leads to depression (9). Psychosocial development and social support of adolescents with and without visual impairments was assessed. The results showed that the psychological well-being of the two groups of adolescents did not differ. However, visual impairments tended to cause stress, especially in girls, and many adolescents with visual impairments reported problems in their relationships with friends (10). Visual impairment had a greater impact on social relationships according to its severity and onset (11). It was reported that self-concept and social adjustment of adolescents with visual impairments were similar in different educational settings (12). However, small samples, different scales, and gender and cultural differences make it hard to draw conclusions from these studies (13).

## 2. Objectives

In this study, an attempt was made to examine the levels of anxiety, frustration, aggression and adjustment and their influence on psycho-physiological disorders among visually impaired adolescent students. The study also aimed at understanding the influences of variables such as gender and age on the occurrence of psychologi-

cal and psycho-physiological disorders.

## 3. Patients and Methods

In order to meet out the above objectives, 150 visually impaired adolescent students studying in schools, in and around Coimbatore city (Tamil Nadu, India) were included in this study. Five different tools were used and the data were statistically analyzed.

### 3.1. Samples

Among the visually impaired adolescent students approximately 1550 were doing their regular education in special schools or integrated mainstream education in Coimbatore city. For the purpose of this study, the purposive sampling technique was used to collect primary data from 150 respondents. The respondents were visually impaired adolescent students selected from five schools, which included both government and private schools in Coimbatore city. Among the visually impaired students, 71 were males and 79 were females. Since purposive sampling was done, exclusion and inclusion criteria only accepted adolescent students aged between 13 and 19 years old. Low/partial vision (visual acuity between 20"/70" and 20"/200") and total visual impairment was considered as an inclusion criteria for the study. Practically, the included students were unable to read text even with spectacles. Psycho-physiological problems were not taken into account before conduct of the study. Only adolescents without hearing impairment (but with visual impairment) were considered for the study. Permissions were obtained from the coimbatore district collectorate (Tamil Nadu state) and Head masters of the individual institutions, after explaining the benefits of this particular study. The students and the school authorities were assured that their anonymity would be maintained. The questionnaires were administered individually to each participant separately by reading the questions for them and marking their responses. The age of the respondents ranged from 13 to 19 years. Among 150 visually impaired students, most of them were at the mid-adolescence stage (60.0%, 68.7%); followed by early adolescence (32.7%, 24.7%) and late adolescence (7.0%, 6.7%) stage of male and female students, respectively.

### 3.2. Measures

The five tools used in this study were as follows, the personal information profile questionnaire, Taylor's manifest anxiety scale (MAS) (14), frustration test (FT) (15), aggression scale (AS) (16) and adolescent adjustment inventory (AAI) (17). The reliability coefficient values were calculated based on the data obtained from the subjects, based on the translated test and finally compared with the values given in standardized instruments. Twenty-five students were administered to take the test after three weeks to calculate reliability. Discriminate validity was determined by the agreement or association among variables in a tool and was

calculated by spearman's correlation coefficient value between major variables. It was judged on the basis of whether an indicator corresponds to theoretical expectations in terms of relationships with other variables in a tool (18). There were four variables in these tools, anxiety, frustration, aggression and adjustment. Spearman's correlation value among these variables was calculated. The values ranged from 0.963 to 0.603. All the values were within an acceptable range due to not having any values less than 0.3 (19).

### 3.3. Personal Information Profile Questionnaire

This questionnaire was used to collect data regarding the individual aspects of the students, namely, gender, age, class, number of siblings, nature and reason of impairment, type of birth, residential area, monthly income, economic status of the family, parent's marriage details and number of psycho-physiological disorders. The major impairment categories consisted of 1) due to congenital reasons, 2) due to sickness and 3) due to accident.

### 3.4. Taylor's Manifest Anxiety Scale (MAS)

In 1953, Taylor published his results of an experiment in which the performance of adults in a classical conditioning situation was found to be related to the scores on a questionnaire relating to anxiety. The Taylor's manifest anxiety scale (14), one of the earliest self-report inventories, has been used extensively in experimental results. These questionnaires are filled by giving 'T' (for true) or 'F' (for false) answers for each of the 50 statements. A score that was higher than average (14 or 15) indicated high degree of anxiety. Low scores indicated low level of anxiety and scores much higher than the average suggested that the person experienced an unusually high degree of anxiety. Taylor reported retest correlations of 0.89, 0.82 and 0.81 over intervals of three weeks, five months and nine to seventeen months, respectively. The split half and test-retest reliability coefficients were found to be 0.92 and 0.87, respectively. The validity coefficient was found to be 0.96.

### 3.5. Frustration Test (FT)

Frustration test studies the effect of frustration upon the quality of a person's behavior as a whole. Scores above 35 in each of the categories are matters of concern because of high frustration level. Frustration clear lines are indicated by scores below 15. This scale consists of 40 items, out of which each of the four modes of frustration has 10 items. Regression, fixation, resignation and aggression are the four modes of frustration. The split half test-retest reliability coefficients were found to be: regression (0.78), fixation (0.92), aggression (0.87) and as a whole (0.88). The validity coefficient was found to be 0.72.

### 3.6. Aggression Scale (AS)

Aggression has been defined as "an act whose goal response is injury to an organism or organism-surrogate"

(20). Aggressive behavior is a logical and expected consequence of frustration. Frustration produces instigations to a number of different types of responses, one of which is instigation to some form of aggression. This scale has 30 items. Each of the items has five alternate answers (multiple choice) graded on a five-point scale on the positive dimension and a zero point on the negative dimension. This test is valid for the measurement of aggression of 11 to 24-year-olds. The level of aggression was categorized based on the scores obtained by the subjects. Scores of 107 and above were categorized as 'saturated', scores ranging from 90 to 106 as 'high', scores of 61 to 89 as 'average', 46 to 60 as 'low' and scores of 45 and below as 'clean'. The split half and test-retest reliability coefficients were found to be 0.82 and 0.78, respectively. The validity coefficient was found to be 0.60.

### 3.7. Adolescent Adjustment Inventory (AAI)

The adolescent adjustment inventory (17) is one of the well-standardized inventories for adolescents. It measures social and personal adjustment. High scores indicate mal-adjustment and low scores indicate that the subject is well adjusted. The odd-even reliability coefficients were 0.84 and 0.95 for personal and social adjustment, respectively, after applying spearman's brown correction. Scores on both parts were also found to be significantly correlated. The validity coefficient was found to be 0.89.

### 3.8. Statistical Techniques Used

The collected primary data were codified and the data were fed into a computer database using statistical package for social sciences (SPSS for windows; version 10.0.1, SPSS Inc.). The data were analyzed and interpreted with appropriate tabulations and diagrams for statistical presentation. Chi-square test, t test, one-way analysis of variance (ANOVA) and Pearson's correlations were conducted to testify the hypothesized tests.

## 4. Results

Descriptive statistical analysis was performed with scores obtained from the 150 visually impaired adolescent students. The results are shown in Table 1.

It was found that anxiety had a significant influence on adjustment (social and personal) level among visually impaired students ( $\chi^2 = 185.66$ ,  $df = 4$ ,  $P = 0$  at  $P < 0.01$ ). Overall, the data revealed the prevalence of moderate levels of both adjustment and anxiety among the 150 visually impaired students (Table 2). Therefore, the hypothesis stating that anxiety level of the visually impaired students will make a significant difference in their social and personal adjustment scores was accepted.

Frustration had a significant influence on adjustment (social and personal) level among visually impaired students ( $\chi^2 = 167.23$ ,  $df = 4$ ,  $P = 0$  at  $P < 0.01$ ) (Table 3). Overall, the data revealed the predominance of moderate levels of both adjustment and frustration among the 150 visu-

ally impaired students. Therefore, the hypothesis stating that frustration level of the visually impaired students will make a significant difference in their social and personal adjustment scores was retained.

It was found that aggression had a significant influence on adjustment (social and personal) level among the visually impaired students ( $\chi^2 = 57.66$ ,  $df = 4$ ,  $P = 0$  at  $P < 0.01$ ) (Table 4). Overall, the data revealed moderate levels of adjustment and low levels of aggression among the respondents. Hence, the hypothesis, stating that aggression level of the visually impaired students will make significant differences in their social and personal adjustment scores, was accepted.

Gender had a significant effect on anxiety level of the visually impaired students ( $\chi^2$  value = 36.125,  $df = 2$ ,  $P = 0$  at  $P < 0.01$ ) (Table 5). The majority of the female respondents were moderately anxious, when compared to the male respondents. Gender had no significant influence on the frustration level of the students ( $\chi^2$  value = 7.142,  $df = 2$ ,  $P = 0.03$  at  $P < 0.05$ ).

Gender significantly affected aggression level of the visually impaired students ( $\chi^2$  value = 77.75,  $df = 2$ ,  $P = 0$  at  $P < 0.01$ ). The majority of the female respondents ( $n = 70$ ) were less aggressive, when compared to the male respondents ( $n = 12$ ). Gender significantly affected the adjustment (social and personal) score of the visually impaired students ( $\chi^2$  value = 14.19,  $df = 2$ ,  $P = 0$  at  $P < 0.01$ ). Among the 150 visually impaired respondents, most of the female ( $n = 61$ ) and male ( $n = 43$ ) respondents possessed moderate adjustment scores. Overall, the data revealed the prevalence of moderate levels of adjustment (social and personal) in both male and female respondents.

There was a significant correlation between age and adjustment level of the visually impaired students ( $r = 0.023$ ,  $n = 150$ ,  $p = 0.779$ , two tailed). There was no significant correlation between age and anxiety level of the visually impaired students ( $r = 0.027$ ,  $n = 150$ ,  $p = 0.741$ , two tailed). Frustration of the visually impaired students was not significantly correlated with their age ( $r = -0.028$ ,  $n = 150$ ,  $P = 0.731$ , two tailed) and similarly, aggression of the visually impaired students was also not significantly correlated with their age ( $r = 0.093$ ,  $n = 150$ ,  $P = 0.258$ , two tailed). There was a significant positive correlation between adjustment scores and anxiety level of the visually impaired students ( $r = 0.919$ ,  $n = 150$ ,  $P = 0$  at  $P < 0.01$ , two tailed). Visually im-

paired students' frustration and aggression level were also positively correlated with social and personal adjustment scores ( $r = 0.887$ ,  $n = 150$ ,  $P = 0$  at  $P < 0.01$ , two tailed) and ( $r = 0.664$ ,  $n = 150$ ,  $P = 0$  at  $P < 0.01$ , two tailed), respectively. The correlation between anxiety and the frustration level of the visually impaired students ( $r = 0.961$ ,  $n = 150$ ,  $P = 0$  at  $P < 0.01$ , two tailed) were positive and statistically significant. Similarly, anxiety and aggression level of the visually impaired students ( $r = 0.727$ ,  $n = 150$ ,  $P = 0$  at  $P < 0.01$ , two tailed) were statistically significant and positively correlated with each other. The correlation between frustration and aggression level of the visually impaired adolescents ( $r = 0.637$ ,  $n = 150$ ,  $P = 0$  at  $P < 0.01$ , two tailed) were found to be positive and statistically significant (Table 6).

#### 4.1. Psychological Problems Versus Psychosomatic Disorders

The respondents were interviewed and their recent case history was obtained from the class teachers, and the presence of disorders was determined by enquiring the subjects directly and having discussions with their teacher. Among the 150 respondents, 29 did not have any disorder with a mean anxiety score of 12.96. Twenty-six respondents had one disorder with a mean score of 25.19. Forty-three respondents had two disorders with a score of 27.98. Fifty-two respondents had three disorders with a score of 34.48. Twenty-nine did not suffer from any disorder with a low mean frustration score of 24.03. Twenty-six respondents had one psycho-physiological disorder with a mean frustration score of 67.38. Forty-three respondents had two disorders with a mean score of 70.18. Fifty-two respondents had three psycho-physiological disorders with a mean frustration score of 84.44. Twenty-nine students did not have any disorder with a mean aggression score of 43.58. Twenty-six students had one disorder with a mean score of 45.81. Forty-three respondents had two disorders with a mean score of 50.86. Fifty-two respondents had three disorders with a mean aggression score of 81.25. Twenty-nine respondents did not have any disorder with a mean adjustment score of 48.17. Twenty-six had one psycho-physiological disorder with a mean adjustment score of 84.42. Forty-three subjects had two disorders with a mean adjustment score of 89.44. Fifty-two respondents had three disorders with a mean adjustment score of 100.71.

**Table 1.** Descriptive Statistics for Psychological Problems Among Visually Impaired Students

Statistics	Mean		Standard Error		Standard Deviation		Minimum Score	Maximum Score	Confidence Level, 99.0%		
	Male (71)	Female (79)	Male (71)	Female (79)	Male (71)	Female (79)			Both genders	Both genders	Male (71)
<b>Gender (Number)</b>											
<b>Anxiety</b>	29.49	24.47	1.08	0.74	9.07	6.6	10	41	2.77	1.91	
<b>Frustration</b>	70.56	61.37	3.01	2.42	25.4	21.48	17	103	7.76	6.22	
<b>Aggression</b>	75.21	44.65	2.55	1.11	21.52	9.91	36	110	6.58	2.87	
<b>Adjustment</b>	83.5	85.5	1.63	1.85	19.3	21.5	40	110	5.9	6.23	

**Table 2.** The Relationship Between Anxiety and Adjustment Scores Among Visually Impaired Students

Adjustment (Social and Personal) Category	Anxiety			Total
	Low	Medium	High	
Low	28	0	0	28
Medium	0	86	18	104
High	0	4	14	18
<b>Total</b>	28	90	32	150

**Table 3.** The Relationship Between Frustration and Adjustment Scores Among Visually Impaired Students

Adjustment Category	Frustration			Total
	Low	Medium	High	
Low	28	0	0	28
Medium	0	80	24	104
High	0	6	12	18
<b>Total</b>	28	86	36	150

**Table 4.** The Relationship Between Aggression and Adjustment Scores Among Visually Impaired Students

Adjustment Category	Aggression			Total
	Low	Medium	High	
Low	26	2	0	28
Medium	56	38	10	104
High	0	7	11	18
<b>Total</b>	82	47	21	150

**Table 5.** The Relationship Between Gender and Psychological Issues Among the Visually Impaired Students

Variable	Low	Medium	High	Total
<b>Anxiety</b>				
Male	12	29	30	71
Female	16	61	2	79
Total	28	90	32	150
<b>Frustration</b>				
Male	12	35	24	71
Female	16	51	12	79
Total	28	86	36	150
<b>Aggression</b>				
Male	12	40	19	71
Female	70	7	2	79
Total	82	47	21	150
<b>Adjustment</b>				
Male	12	43	16	71
Female	16	61	2	79
Total	28	104	18	150

**Table 6.** The Relationship Amongst Age, Adjustment (Social and Personal), Anxiety, Frustration and Aggression of Visually Impaired Adolescent Students<sup>a</sup>

Category	Age	Adjustment	Anxiety	Frustration	Aggression
<b>Age</b>					
r	1	0.023	0.027	-0.028	0.093
Sig.		0.779	0.741	0.731	0.258
<b>Adjustment</b>					
r		1	0.919 <sup>b</sup>	0.887 <sup>b</sup>	0.664 <sup>b</sup>
Sig.			0.000	0.000	0.000
<b>Anxiety</b>					
r			1	0.961 <sup>b</sup>	0.727 <sup>b</sup>
Sig.				0.000	0.000
<b>Frustration</b>					
r				1	0.637 <sup>b</sup>
Sig.					0.000
<b>Aggression</b>					
r					1

<sup>a</sup>Correlation was significant at the 0.05 level (2-tailed).

<sup>b</sup>Correlation was significant at the 0.01 level (2-tailed).

## 5. Discussion

In this study, an effort was made to investigate the psychological problems of visually impaired adolescent students. In general, when the cause for impairment was analyzed among the students, nearly half of the visually impaired respondents (48.0%) were blind due to inborn deformities. In general, the data revealed the prevalence of medium levels of social and personal adjustment, anxiety, frustration and aggression among the respondents. It was confirmed that when there is an increase in anxiety, there is proportionate increase in maladjustment or poor adjustment. The adolescent stages did not have a significant relationship with the student's adjustment, anxiety, frustration and aggression levels. The above results were in line with the findings of already reported studies (9, 21, 22). It could be deduced that most of the visually impaired adolescents make appropriate social and personal adjustments based on their level of frustration. 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 (personal and social) varies in accordance with the rate of aggression (23). 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 frustration and aggression level among the respondents. Furthermore, escalation in the level of anxiety tends to increase the aggression level, which depicts that

there is a strong relationship between anxiety and aggression level among visually impaired adolescents. There is a relationship between frustration and aggression level among visually impaired adolescents. When they have increased frustration they tend to be aggressive in nature. This might be due to their inability to overcome the frustration hence they develop a defensive attitude. The findings also indicated that there is a prevalence of learning disability, communication disorders and educational retardation due to hearing loss. This may lead to frustration, which tends to manifest into disproportionate aggression. This study is in agreement with previous results (24). Gender of the visually impaired students does have a significant relationship with anxiety, frustration, aggression and adjustment level. 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 adolescents, which projects that adolescent boys tend to have significantly higher stress than girls and girls tend to have significantly higher self-confidence (25). It could be deduced that gender and frustration level among visually impaired students are independent. A significant portion of the visually impaired students irrespective of their gender identity had been experiencing frustration. However, 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 (26). It is evident that there is a strong relationship between the occurrence of psycho-physiological disorders and anxiety, frustration, aggression and adjustment among visually impaired students. Increase in the scores of psychological disorders as mentioned above is directly related to an increase in the number of psycho-physiological disorders among visually impaired adolescents. The above findings were in accordance with earlier reports (27). It was found that the irritable bowel syndrome (IBS) was associated with a higher frequency of generalized anxiety disorder (28). It was also reported that there was a strong significant relationship between depression and anxiety with headaches and irritable bowel syndrome (IBS) (29). When the relationship between anger and psycho-physiological disorders was examined, focusing mostly on anger when it is suppressed or held in rather than expressed behaviorally, as predicted, tension headache sufferers were found to have significantly more anger than non-pair controls (30). The psychosocial implications for better understanding of psychological and psycho-physiological problems can be drawn from this study. Assessing anxiety, frustration, aggression and adjustment level of adolescents may facilitate teachers and parents to get to know the level of psychological problems and help the affected individuals overcome the problems with the help of counselors. The teachers, parents and counselors can easily understand the demographic variables and how far they are related to the students' psychological problems. This study indicated that the students who are affected by psychosomatic disorders may realize the cause for the disorders might be due to maladjustment, anxiety, frustration and aggression. Awareness programs can be put in place for teachers, parents and students to understand the psychological problems of the subjects. The visually impaired students belong to low vision to total blindness categories. Collection of data was done individually for the visually impaired students with strain, spending more time was considered as a major limitation of this study. In the future, this work can be extended by including independent variables such as neurotic tendencies and phobias of the subjects. The dependent variables like scholastic performance, creativity, psychosomatic problems like dermatitis, skin eruptions, eating disorders, backache, hiccoughs and menstrual disturbances can also be included. A similar study can also be done for orthopedic students including all the above variables.

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### Footnotes

**Authors' Contribution:**Bhuvanewari Mohanraj was solely responsible for the commencement and design of the study. Immanuel Selvaraj Chinnadurai collected the data from the visually impaired adolescent subjects from various special schools and interpreted them. Bhuvanewari Mohanraj and Immanuel Selvaraj Chinnadurai drafted the manuscript and they together read and approved the final version. The work was carried out under the technical guidance of Thiruvengadam Srinivasan and Balakrishnan Selvaraj; both corrected the manuscript for its accuracy and suggested statistical interpretations.

**Declaration of interest:**None declared.

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