Frequency of anemia, and its effects on intelligence and emotional intelligence of 10th class students of Government Schools of District Charsadda, Khyber Pakhtunkhwa

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ABSTRACT

BACKGROUND: Anemia caused from Iron deficiency is one of most wide-spread diseases in the world. School children especially the adolescence are more prone to anemia and its consequences because of their different nutritional needs. Students with low hemoglobin will have low emotional intelligence and intelligence.

OBJECTIVE: To assess frequency of anemia and its effect on intelligence and Emotional intelligence score of 10th class students of government schools of District Charsada Khyber Pakhtunkhwa.

MATERIAL & METHOD: A Cross-sectional descriptive study conducted in Government schools of district Charsada from 1st February to 30thApril 2016. Total of 400 students were selected by simple random sampling technique. A self administered questionnaire was implemented and blood sample were taken from those who were present on the day of blood sampling and consented to give blood sample.

RESULTS: The mean intelligence test score of the students were severe anemic 32.2 ±10.8, mild anemic 37.2 ± 6, moderate anemic 37.9 ± 10.7 and non-anemic 37 ± 12, and mean scores were 24.6 ±6.9, 25.9 ± 6.1, 25.8 ±6, 25 ±5.7 respectively

CONCLUSION: Intelligence and are affected if Hemoglobin levels is below 8g/dl, while above this level of Hemoglobin both of these cognitive modalities show no significant variation.

Key words: *Intelligence , Emotional intelligence , blood Hb levels, Anemia.*

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INTRODUCTION:

The physical and emotional intelligence along with the other variables affect the academic status of the students. As students who are not healthy they do not do well in their studies, they may present with anemia, especially in developing countries which is one of the common problems among students and have a negative impact. Anemia in school children results in poor cognitive and emotional development, impaired physical development, poor school performance and reduced work capacity with impaired social and economic development of the country[1].

According to World health organization iron deficiency anemia affects approximately 2 billion people (34%) of the population globally[2]. The rate among students is 25.4% and in preschool age children it reaches to 47.4%[3]. Beside all other consequences anemia also results in distress, reduced brain development and thus leads to impairment of academic performance of the children[4]. This deficiency could be the result of poor dietary intake or chronic infection, could be an indication of celiac diseases, but in our set up infections like malaria, diarrhea and measles could also lead to anemia among these children[5].

Intelligence is the ability to achieve one's goals in life, given one's socio-cultural context, by capitalizing on strengths and correcting or compensating for weakness in order to adapt to shape and select environment through combination of Analytical , creative and practical intelligence[6] , while Emotional intelligence is abilities such as being able to motivate oneself and persist in face of frustration , to control impulse and delay gratification , to regulate one's moods and keep distress from swamping the ability of think to empathize and to hope are used here[7].

This study focused on frequency of anemia and its effect on the intellectual and emotional intelligence (EI) score of class 10th students of government schools of district Charsada of KPK, Pakistan. We focused on government schools as these schools are accessible to the local communities and these student lack facilitation and assistance from the parents and school.

MATERIALS & METHODS:

A cross sectional descriptive study was conducted in the all government schools of district Charsada. Target group was class 10th students 40 students were selected by simple random sampling technique from each of the 10 schools.

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Ethical approval was obtained from the Ethical committee of the institute and also EDO education Charsada was procured. Education development officer (EDO) identified the location of the different schools for the survey. Consents were taken from the head of participating schools as well as from the parents or guardians of the children who were supposed to be a part of this survey.

Those students who were willing to participate were included in the study population and those who were absent on day of data collection were excluded from the study population. Informed verbal consent was taken from students.

The EI portion consists of questionnaire generated on basis of Daniel Goldman theory of EI[8] . The questionnaire consists of questions regarding five components of EI i.e.

1. Self awareness
2. Self Management
3. Motivation
4. Social awareness
5. Social Management

The General Intelligence test portion of questionnaire was created on basis of Sternberg's triarchic[9] theory of intelligence .According to this theory intelligence consist of three components analytical intelligence, creative intelligence and practical intelligence. Each was evaluated as:

The Analytical component involved when the information processing components of intelligence were applied to analyze, evaluate in relatively familiar kind of problems, for this purpose we used marks in 9th class in the previous board examination as measure of their analytical or academic intelligence.

Creative intelligence was measured by test created according to Torrance creative intelligence[10] test, to access how well an individual cope with an unseen passage. The test consists of five questions.

1. Making different shapes using geometrical figures i.e. drawing cartoon using a circle, triangle, square.
2. Drawing different shapes by using lines i.e. Making table using line
3. Questions were asked about an unseen picture
4. Writing unusual uses of different familiar tool or objects i.e. unusual uses of match stick
5. Writing about consequences of some improbable situation i.e. consequences of no raining for many years.

They were asked to write a story in 15 minutes, “describe the world through an eye of insect”, it was scored for originality and development of the plot for the quality.

Practical intelligence was assessed by applying individual abilities to the kinds of problems that they confront in their daily life at school. The student were asked

1. His daily Goals and Ambition in life
2. His planning for achieving his goal to evaluate his self adapting and self shaping ability for attaining his daily goals and long term goals
3. The reasons for choosing particular goals and the planning for achieving it to evaluate his ability of using his knowledge and experience in the above 2 .
4. Evaluation of subject's success in achieving his goals on scale of 1 to 5 by one of his class fellows
5. Evaluation of subject's success in achieving his goals on scale of 1 to 5 by his teacher .

Blood samples were collected from those students who were present on day of blood collection and had completed the questionnaire. Blood was taken by a trained health technician under aseptic condition. Potassium oxalate was used as anticoagulant and blood samples were delivered to the private laboratory on the same day for analysis. Blood was analyzed in the automatic Hb analyzer. Anemia was diagnosed and classified according to WHO Hb cut off values for anemia i.e. 13g/dl non anemic, 11-13 g/dl mild anemic, 8-11 g/dl moderate and 8 g/dl and below as severe anemia[11].

The data was analyzed in Microsoft Excel and result presented in text and graphically. Mean (of percentage of total marks of student from their 9th class board exam + intelligence test marks for intelligence+EI) were calculated.

RESULTS:

Out of 399 students blood was collected from 251 students making the response rate 62.90% The mean Hb levels obtained were 10.8±1.4. Out 251 students 10(4%) were severe anemic, 121(48.2%) were moderate anemic, 109(43.4%), were mild anemic, and only 11 (4.4%) were non anemic.

The mean intelligence test score of these student were 32.2 ±10.8, 37.2 ± 6 , 37.9 ± 10.7, 37 ± 12, respectively and mean EI scores were 24.6 ±6.9, 25.9 ± 6.1, 25.8 ±6, 25 ±5.7 respectively.
Intelligence was above 70% in non anemic while emotional mild, was lowest in severe anemic followed by moderate, mild and non anemic see table 1 for detail.

DISCUSSION:

Our study revealed that intelligence and emotional intelligence score is lowest in those students who are severely anemic. Study on adjustment and emotional intelligence indicated that higher emotional intelligence scores may predict better overall adjustment[12], as well as better functioning in terms of internalizing and externalizing behaviors[12].

Emotional intelligence is most important in adolescence because of rapid emotional changes associated with adolescence growth[12]. It gives them a sense of control for emotional regulation although assume to be mostly done during childhood failure to develop strong emotional intelligence leads to depression and aggressive behavior during this transitional phase of life. Also this intelligence is important in developing skills of an individual in communication, leadership, collaboration and cooperation[13] which are needed for interaction with others in the community and the work place.

For the students belonging to different anemia group have this sequence of intelligence and Emotional intelligence, non-anemic ~ mild anemic ~ moderate anemic > severe anemic while the relation of intelligence and EI with the Hb levels was more conclusive, reveling intelligence maximum around Hb level 7g/dl and EI minimum around the same HB level, while at HB levels above 8 g/dl, no significant effect on both of above mentioned cognitive modalities is evident, also EI was seen comparatively more at Hb levels 13g/dl consistent with result of other studies[14]. The students having low Hb levels might be kept from manifesting their intelligence, because of low EI , gives an indirect relation of low intellectual performance of these student with low Hb levels (around HB level 7g/dl) .

Fig1: frequency of anemia, emotional intelligence and intelligence level of class 10th students of district Charsada.

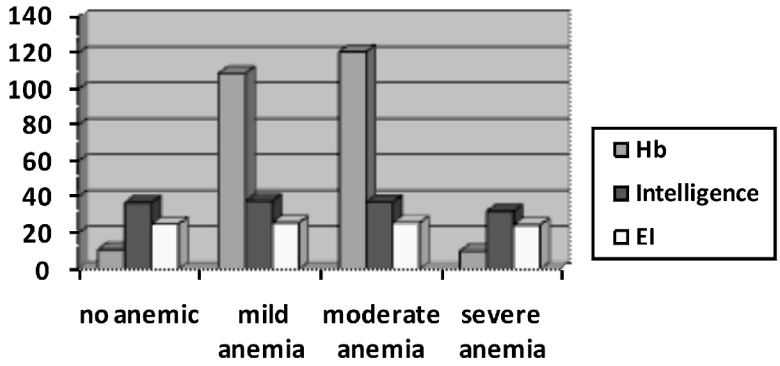


Table 1: anemia comparison with emotional intelligence and intelligence score of class 10th students of district Charsada.

	Emotional intelligence					Intelligence		
	Self awareness	Self management	Motivation	Social awareness	Social management	Analtytical	Practical	creative
Non anemic	3.32(66.5)	3.27(65.4)	2.45(49)	4.22(84.4)	3.56(71.2)	360(65.45)	3.59(71.81)	11.16(44.64)
Mild	3.68(73.6)	3.82(76.4)	2.41(48.2)	4.16(83.2)	3.38(67.6)	336.34(59.11)	3.30(66.09)	10.55(42.2)
Moderate	3.97(79.4)	3.89(77.8)	2.26(45.2)	3.58(71.6)	3.77(75.4)	318.98(55.51)	3.32(66.41)	10.61(42.45)
Severe	3.92(78.4)	3.76(75.2)	2.11(42.2)	2.98(59.6)	3.14(62.8)	290(52.72)	3.01(60.02)	9.02(36.81)

including intelligence is correlated with blood Hb levels[15] a study conducted in Islamabad in which , non-anemic students performed well on intelligence test as compared to anemic students[16] other possible reasons contributing to the low intelligence of student are their uneducated parents and poor socio-economic background [17] which leads to poverty, poor nutrition and unhealthy living conditions putting additional burden on a growing child.

Because of the small sample size, shorter study period and lack of resources and small number of students a relationship with anemia and the intelligence and Emotional intelligence could not be made conclusive. Further research is needed to find the cause of this physiological problem which negatively affects learning and educational achievement of the students. Public health experts should look for solutions by addressing to the root causes of the problem.

CONCLUSION:

Solution to problem lies in our passion of solving it, this simple study unveiled some facts of the student's poor performance in schools. In-depth research is needed to identify the underlying reason for anemia poor intelligence and emotional intelligence.

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