

## Original Research Article

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# Association of somatic problems with mental health among sickle cell anaemic adolescents of Chhattisgarh, India

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## ABSTRACT

**Background:** The sickle cell disease is characterized by various somatic problems and medical complications with psychological problems. Sickle cell patient faces physical, economical and psychological burden. There is paucity of evidences in understanding the bio-psychological aspects of sickle cell anaemic patients especially in India. Therefore, an attempt has been made to know the somatic problems in adolescents and its effects in mental health of the adolescents suffering from sickle cell anaemia. The main aim was to find out association of somatic problems with mental health among adolescents suffering from sickle cell anaemia and occurrence of somatic problems among homozygous/heterozygous sickle cell adolescents

**Methods:** The total sample of the study consists of 309 sickle cell anaemic adolescents of age range 11-19 years. The information was collected for present research from various hospitals and health clinics of Chhattisgarh state during January, 2013 to July, 2015. An interview-schedule was prepared to know the various somatic problems and other related information. Mental Health Battery (Hindi version) was used to assess the mental health among sickle cell anaemic adolescents developed by Singh and Gupta, 1983.

**Results:** The study revealed that 23.3 percent of the cases were homozygous whereas 76.7 percent cases were heterozygous. The overall contribution of mental health dimension are 28.0% ( $R^2=.280$ ;  $F (3,304) =31.250$ ;  $p<0.01$ ) in which two predictors of mental health namely Emotional Stability and Overall Adjustment contributed significantly. Total 84.1 percent patients were reported somatic problems and somatic problems of sickle cell patients are significantly and negatively related to all dimensions of mental health.

**Conclusions:** For reducing the somatic problems, mental health of the adolescents will have to be increased.

**Keywords:** Mental health, Somatic problems, Sickle cell anaemia, Adolescents

## INTRODUCTION

Sickle cell anaemia is a hereditary haemolytic disorder in which human haemoglobin molecules become mutant.<sup>1</sup> which results in production of abnormal sickle shaped RBCs, therefore it is known as sickle cell. The patients who have severe chronic anaemia resulting from excessive destruction of their erythrocytes are termed as sickle cell anaemia.<sup>2</sup> About five percent of the world population is carrier for hemoglobin disorders.<sup>3</sup> It is an

important public health problem in India also. The sickle cell gene prevalence in India varies from 2-34 percent.<sup>4</sup> Panigrahi, Patra and Khodiar, (2014) found 11 percent prevalence of sickle cell anaemia in Chhattisgarh.<sup>5</sup> The sickle cell disease can be characterized by various somatic symptoms and medical complications like recurrent pain, anemia, and low exercise tolerance, splenic sequestration, susceptibility to infection, lung problems, late onset of puberty, stroke, priapism, enuresis, delayed growth and decreased life expectancy.<sup>6</sup>

Edwards, Fillingim and Keefe, (2001) has shown that psychosocial factors contribute to complaints of pain.<sup>7</sup> Pain can be throbbing, sharp, dull and unpredictable related to lower back, legs, knees, chest, arms and abdomen.<sup>8</sup>

Mental health is a 'state of well-being in which an individual realizes his or her own potential, can cope with the normal stress of life, can work productively and fruitfully and is able to make a contribution to her or his community'.<sup>3</sup> Meninger, (1945) defined mental health as 'mental health is the adjustment of human beings to the world and to each other with a maximum of effectiveness and happiness. It is the ability to maintain an even temper, an alert intelligence, socially considerate behavior and a happy disposition, in simple words it means the capability to balance feelings, desires, ambitions and ideas in ones day to day life'.<sup>9</sup> There are various dimensions of mental health viz. emotional stability, adjustment, autonomy, security-insecurity, self-concept, and intelligence.

Studies found that both the physiological and psychological problems are associated with sickle cell disease.<sup>10,11</sup> Symptoms of depression and anxiety have been reported among adolescents and children and mental disorder viz. separation, opposition, anxiety disorder and defiant disorder, attention deficit hyperactivity disorder and enuresis disorder, are found among children with sickle cell disease.<sup>12,13</sup> SCD patients have psychosocial, behavior problems, impaired peer relationships and repeated absence in school.<sup>14,15</sup> Depression in children with sickle cell disease had shown mixed results where children experience high rate of fatigue, somatic complaints, impaired self esteem, hopelessness feelings, school absenteeism etc.<sup>16</sup> Various studies have shown psychosocial health problems during adolescence viz. depression, anxiety and substance misuse. Few published studies have reported prevalence of mental disorders. Adolescents with sickle cell disease had more severe depression compared to the adolescents suffering from cystic fibrosis, spina bifida and diabetes mellitus.<sup>17</sup> Significantly higher depression score was observed in adolescents with SCD reported by Morgan and Jackson, 1986.<sup>18</sup> Sickle cell adolescents show higher level of behavioral problems than younger patients.<sup>19</sup>

Sickle cell anaemia is an inherited blood disorder with physical, economical and psychological burden to patients and its increasing prevalence in India needs to explore the somatic problems and psychological factors contributing to the problem. There is paucity of evidences in understanding the bio-psychological aspects of sickle cell anaemic patients especially in Chhattisgarh. Therefore, an attempt has been made to know the psychological problems in adolescents and its effects in mental health of the adolescents suffering from sickle cell anaemia. The sickle cell disease patients have many somatic complaints and vary from patients to patients. Therefore it is necessary to find out the mental health predictors of the somatic complaints among the sickle

cell disease adolescents in order to help them in better adjustment.

### **Objectives**

The main aim was to find out association of somatic problems with mental health among adolescents suffering from sickle cell anaemia and occurrence of somatic problems among homozygous/heterozygous sickle cell adolescents.

### **METHODS**

For the present investigation data was collected from hospitals and health clinics of various districts of Chhattisgarh, India during January, 2013 to July, 2015 where regular investigations of sickling are being done. The total sample of the study consists of 309 sickle cell anaemic adolescents (112 were males and 197 were females) of age range from 11-19 years. Purposive sampling technique was used for the selection of the sample. The inclusion criteria of the study was all the diagnosed cases of sickle cell anaemia (homozygous and heterozygous) belonged to 11-19 years age group (adolescents) of either sex from various hospitals of Chhattisgarh and exclusion criteria of sample of the study were subjects having major medical illness, patients suffering from other genetic or chromosomal abnormalities and congenital anomaly, renal disease related to SCD, rheumatic arthritis and illiterate patients of sickle cell anaemia.

### **Data collection**

Primary information was collected from various hospitals and health clinics of eleven districts of Chhattisgarh by using non-participant observation, interview-schedule, mental health battery (MHB). An introductory explanation was made to inform the patients, parents and guardians about the purpose of study. Signed, informed consent was obtained from the patients.

### **Measures**

An *interview-schedule* was prepared to know the various somatic problems and other related information. Mental Health Battery (Hindi version) was used to assess the mental health among sickle cell anaemic adolescents of Chhattisgarh developed by Singh and Gupta.<sup>20</sup> Mental health battery includes six dimensions of mental health viz. emotional stability (ES), overall adjustment (OA), security insecurity (SI), autonomy (AY), self concept (SC) and intelligence (IG). Basic information of mental health dimension is given in (Table 1).

### **Analysis**

The information obtained was scored as per the manual and organized and tabulated for the analysis. To analyze the obtained data descriptive analysis (Frequency, Mean, and Standard Deviation), correlation analysis, Multiple

Regression was computed with the help of IBM SPSS Statistics 20.lnk.

## RESULTS

Total 309 sickle cell adolescent patients selected for the present investigation in which, most were found to be heterozygous as compare to homozygous. The mean age of sickle cell anaemia was 15.5 (SD=2.05). Weakness

was the most prevalent symptom in sickle cell patients which was higher in females as compared to males. The second common symptom was anaemia which was also moderately higher in females. Most of the respondents suffered from joint and abdominal pain. In both the sexes the percentage of respondents who attended higher secondary school was quite high. Majority of the family members earn less than 5000 rupees per month. Most of the sickle cell adolescents had very poor level of mental health.

**Table 1: Basic information of mental health dimension.**

SN	Basic information	Number of items	Number of dimensions	Response	Scoring	Reliability
1	Originally developed by Singh and Gupta (1983).	130	6	'Yes' or 'No' & 'Right' or 'Wrong'	1 for 'Yes/ right' & 0 for 'No/wrong'	Cronbach's alpha ( $\alpha$ ) 0.82.

**Table 2. Zygosity of sickle cell adolescents with gender distribution.**

S.N.	Zygosity	Male		Female		Total	
		No.	%	No.	%	No.	%
1	Homozygous	38	33.9	34	17.3	72	23.3
2	Heterozygous	74	66.1	163	82.7	237	76.7
	Total	112	100	197	100.0	309	100.0

**Table 3. Occurrence of somatic problems in sickle cell patients.**

S.N.	Somatic problems	Heterozygous		Homozygous		Total	
		No.	%	No.	%	No.	%
1	Yes	192	81.0	68	94.4	260	84.1
2	None	45	18.9	4	5.6	49	15.9

Mean value of somatic problems occurred = 4.15; SD = 2.18

**Table 4: Correlation between Somatic problems and mental health.**

S.N.	Mental health dimensions	Somatic problems			
		Mean	SD	Correlation (r)	P value
1	Emotional stability	9.2	3.2	-0.333	.000
2	Overall adjustment	23.9	4.6	-0.271	.000
3	Autonomy	10.7	2.1	-0.026	.324
4	Security insecurity	9.6	2.1	-0.149	.004
5	Self concept	7.3	2.4	-0.108	.028
6	IQ	13.9	5.8	-0.235	.000
7	Overall mental health	74.4	12.7	-0.339	.000

**Table 5: Linear regression of mental health and somatic problems.**

S.N.	Predictors	R <sup>2</sup> Change	B-coefficient	t-value	Significance
1	Emotional stability	.083	-.029	-5.81	.000
2	Overall adjustment	.028	-.187	-3.46	.001
3	Zygosity	.169	.411	.789	.000

R<sup>2</sup>=.280; F (3, 304) =31.250; p<0.01.

The percentage distribution of zygosity in patients classified according to gender. The table revealed that 23.3% of the cases were homozygous (Males-33.9%;

Females-17.3%) whereas 76.7% cases were heterozygous (Males-66.1%; Females-82.7%) (Table 2).

The occurrence of somatic problems among the sickle cell patients in which 84.1 percent patients were reported somatic problems. The frequency of presence of somatic problems were observed to be higher in homozygous i.e. 94.4% compared to heterozygous i.e. 81.01% whereas only 5.6% homozygous individuals reported that they do not have any somatic problems and 18.9% heterozygous individuals reported that they do not suffer from any problem (Table 3).

The correlation between somatic problems and dimensions of mental health showed that somatic problems of sickle cell patients are significantly and negatively related to all dimensions of mental health viz. Emotional stability; overall adjustment, security insecurity, self concept, IQ, Overall mental health except autonomy (insignificant). Therefore, higher level of mental health dimension lower will be the Emotional stability; overall adjustment, security insecurity, self concept, IQ, Overall mental health. In order to reduce the Emotional stability; overall adjustment, security insecurity, self concept, IQ, Overall mental health, mental health dimensions will have to be enhanced (Table 4).

To explore the mental health predictors of somatic problems in sickle cell adolescents linear regression analysis have been computed. Regression model revealed that there was significant contribution of independent variable in the variation of criterion variables. The overall contribution of independent variable are 28.0% ( $R^2=0.280$ ;  $F (3,304) =31.250$ ;  $p<0.01$ ) in which two predictors of mental health namely emotional stability ( $R^2=0.083$ ;  $B=-0.0289$ ;  $t=-5.81$ ;  $p=0.000$ ) and Overall Adjustment ( $R^2=0.028$ ;  $B=-0.187$ ;  $t=-3.46$ ;  $p=0.001$ ) contributed significantly on changes in criterion variables. Emotional stability (8.3%) and overall adjustment (2.8%) and zygosity (16.9%) contributed significantly on changes in somatic problems of sickle cell anaemic patients. The significantly negative relation between somatic problems and emotional stability, overall adjustment shows higher the emotional stability, overall adjustment, lower will be the somatic problems. The present study shows highest positive contribution of zygosity on variation in somatic problems which means more somatic problems occurred among the homozygous sickle cell patients (Table 5).

## DISCUSSION

Weakness was the most prevalent symptom in sickle cell patients considered for the present study which is in conformity with the studies conducted by Patra et al; Chikhlikar and Wilkinson (2014).<sup>21,22</sup> In the present study most of the patients replied that they had weakness followed by anaemia and joint / abdominal pain. Many studies have also reported the similar clinical symptoms in their studied populations.<sup>23-26</sup>

Results of the present study reveal that somatic problems of SCD are significantly and positively related to all dimensions of mental health. These findings are in coherence with findings of earlier researches which report that psychological variables are associated with sickle cell disease problems. Relationship between medical problems and psychopathology in SCD patients were observed by Leavell and Ford.<sup>27</sup> Morgan and Jackson; Seigel, Golden, Gough, Lashley, and Sacker observed significantly higher depression scores among adolescent with SCD as compared to normal.<sup>19,28</sup> Jacob observed that SCD patients who experience frequent painful crisis exhibits problems with self concept, low self esteem, anxiety and depression.<sup>28</sup>

Emotional Stability, overall adjustment and zygosity contributed significantly on changes in some problems of SCD. There was significant negative relation between somatic problems and emotional stability, overall adjustment, Security Insecurity, self concept. The study of Ohaeri and Shokunbi revealed that psychosocial burden indices, financial burden and disruption of family routines were significantly higher in sickle cell disease patients.<sup>29</sup> High prevalence of psychiatric disorders including depression, anxiety, attention deficit, oppositional defiant disorder and conduct disorder was observed by Benton, Boyd, Ifeagwu, Feldtmose, and Whitley in 2011 among the SCD adolescents.<sup>30</sup> Sogutlu, Levenson, McClish, Rosef, and Smith also observed that somatic symptom of SCD patients was associated with depression; anxiety and poor health related quality of life.<sup>31</sup> Simon et al concluded that SCD adolescents' interpersonal characteristics were significantly associated with depression and anxiety.<sup>32</sup>

## CONCLUSION

The main objectives of the present investigation were to explore the somatic complaints of sickle cell disorder in adolescents and its relationship with mental health status of sickle cell adolescents of Chhattisgarh. The investigation revealed that frequency of heterozygous patients was higher than homozygous patients and more somatic problems occurred in homozygous sickle cell patients. The somatic problems as perceived by the respondents were weakness, anaemia, joint and abdominal pain etc. The correlation between somatic problems and mental health dimensions indicate that for reducing the somatic problems, mental health dimension viz. will have to be increased. Results showed higher the emotional stability, overall adjustment; lower will be the somatic problems.

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