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Psychological Factors Predicting Mental Wellness and Coping in a Sample of Adolescents Suffering from Sickle-Cell Anaemia

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ABSTRACT This study investigated self-esteem (SE), social support, and locus of control (LOC) on the mental wellness and coping behaviour of adolescents suffering from sickle-cell anaemia. This was predicated on the assumption that because of the nature of sickle-cell disease (SCD), patients with high SE, good SS, and has internal LOC would evidence less psychological disturbances and consequently cope better than those with low SE, poor SS and have external LOC. Instruments used include SE scale, SS scale, Awaritefe psychological index, LOC scale and coping (revised) with two dimensions of coping - problem-focused and emotion -emotion focused, using the mean as cut off point. One hundred and fifteen clinically diagnosed sickle-cell patients with an average age of 23.1 years (SD =2.70), and average hospital attendance of 5.4 years were randomly sampled among sickle-cell patients attending University College Hospital (UCH), Ibadan, Lagos University Teaching Hospital (LUTH) and General Hospital, Lagos all in the South-western part of Nigeria. Using a 2x2x2 factorial analysis, results obtained showed a significant relationship between SE (F 1,47=108.948, P<. 001) and SS (F 1,47=10504.825,P<. 01) on mental health status of sickle -cell patients and also a significant main effect of SE (F 1,47=67.646,P<. 001) and SS F 1,47=3.551,P<. 05) on coping behaviour. A significant interaction effect of SE, SS and LOC was sustained (F 1,47=25.552, P<. 001) and (F 1,47=67.646,P<. 001) on mental wellness and coping respectively. A post-hoc analysis of the means further showed that sickle-cell anaemia patients with low SE, good SS and have internal LOC evidence more psychological disturbances and poorer adjustment than those with high SE, poor SS and have external LOC. On SS, sickle-cell patients reportedly preferred sources of support like friends, spouses and government but were most dissatisfied with the nature of support from the government.

INTRODUCTION

Sickle-cell anaemia is a chronic hereditary, haemolytic anaemia prevalent in the population of large parts of Africa, Saudi Arabia, Southern Italy, Greece, West Indies, certain parts of India and mainly among blacks in the United States of America, occurring in about one of four hundred births of black babies. An estimated fifty thousand blacks in the United States alone have sickle-cell anaemia, (Barnhart et al., 1974). The disease is not a new problem. The basic clinical conditions were observed as early as 1910 by James B. Herrick, a physician, in the bloodstream of a West Indian student, (Smith, 1974).

Sickle-cells are elongated red blood cells with sharp double points, giving the cell a crescent shape rather than the round, disc shape of normal red blood cells. The cells resemble the narrow, curved blade of a sickle used to cut grass; hence the name, sickle -cell anaemia. Sickle-cell anaemia is characterised by a chronic haemolytic anaemia, that is, a deficiency of red blood cells due to their excessive destruction, and intermittent crises of variable frequency and severity involving fever and pains in bones, joints and abdomen. In addition, there is an increased incidence of bacterial infection. A multiplicity of symptoms may occur with gradual involvement of many tissues and organ systems, for example, spleen congestion and a somewhat enlarged liver. Life expectancy is reduced; many sufferers succumb in infancy or early childhood, and most do not survive their fourth decade. The clinical picture is quite varied, however, some patients remain relatively asymptomatic for many years, whereas others become severely disabled or die at an early age, Barnhart, (Henry and Lusher, 1974).

Although some features of the disease may be seen at any age -for example, anaemia, painful crises, and bone infarcts-others occur characteristically in certain age groups. For example, clinical manifestations are generally first noted between 6 months and 2 years of age. The most common problems present in this age group and throughout childhood are infections and dactylytis, that is, joint pains, swelling, and limited motion. In adolescents and young adults, leg ulcers, aseptic necrosis of the femoral head, and retinal lesions are usually seen, (Barnhart et al., 1974).

According to Barnhart et al. (1974) there are two types of sickle-cell anaemia of differing severity. Individuals with SS haemoglobin have inherited sickling haemoglobin, S, from one par-

ent and a different type, crystallising haemoglobin, C, from the other parent. Haemoglobin SS disease and haemoglobin SC disease are both characterised to be a chronic haemoglobin anaemia. However, the clinical manifestation from intravascular occlusion and vaso occlusion is generally less severe in those SC diseases than in those with SS disease. The incidence of bacterial infections is also much less in individuals with SC disease, but they have a greater frequency of aseptic necrosis of the femoral head, retinal infarcts, and renal papillary necrosis.

In the past, treatment has been supportive and limited to the symptoms, only attempting to alleviate pain or combat infections as they occur, since there is no treatment of the disease itself. For example, when pain is severe or if vomiting and dehydration supervenes, hospitalisation is necessary. Fluids are then given intravenously along with analgesic drugs such as codeine or meperidine. A variety of intravenous fluids such as electrolyte solutions, dextrose, dextran, and plasma have reportedly been effective in alleviating pain, presumably through their ability to mobilise trapped sickle-cells. However, severe pain may persist for days or even weeks in some cases despite this measures.

However, the physical aspects of sickle-cell anaemia constitute only one facet of the health problem. The psychological dimension is another and since it is assumed that the disease is incurable, the management of the disease should be an important factor in treatment and therapy and therefore should be wholelistic in scope. Sickle-cell disease has not been well researched from a psychological perspective compared with other chronic illnesses. This is probably because it is a black man's disease.

The physical and psychosocial functioning of individuals with chronic medical condition varies widely. For many condition, medical factors alone do not adequately account for the extent of illness-related dysfunction. Functioning may be significantly affected by psychological factors, including how patients appraise their health status and cope with the stress of their illness (Holroyd and Lazarus, 1982). Consequently, clearer understanding of predi-ctive factors of mental health and coping and health related outcomes may lead to better treatment and improved functioning.

From a psychological perspective, sickle-cell anaemia also causes severe social and emotional problems. The normal adolescent is characterised psychologically as attempting to achieve emancipation from their parents and increasing independence. However, Whitten and Fischoff (1974), described the chronically ill adolescent as afraid to be an autonomous individual, with drawn from relationships, having limited aspirations and poor self-esteem, feeling depressed, helpless and fearful, and preoccupied with death. Singler, (1975) described chronically ill patients as fearful, non-verbal, bolated and having damaged self-esteem. Whitten and Fischoff (1974) postulate the existence of similar emotional and social problems in patients with sickle-cell anaemia, but this has never been documented. Hurtig and White (1986) in a study with children, (8-16 years) with sickle-cell disease in the United States of America, found adolescents patients with more frequent hospitalisation had lower self-esteem, external locus of control and poorer personality social adjustment, while Kumar et al. (1976) did not find any significant difference in self concept and anxiety scores between sickle cell patients and a healthy control group. Moise (1986) with a sample of 33 sickle cell patients in the United States found that better adjustment was associated with internal locus of control and more positive concept. His study did not look into how these variables will affect their mental health status.

Also, there is a dearth of research on patterns of adjustment among patients suffering from sickle-cell anaemia. The balance of evidence suggests that the overall risk of serious psychological dysfunction attributable solely to SCD is marginal. Studies of children have produced mixed results over a ranged measures, but studies of adults appear to indicate a link between SCD and symptoms of depression and other psychological problems, but it is not clear to what extent the types of problems, observed constitute genuine psychopathologies or to what extent SCD is responsible for their appearance. The most important theme to emerge from this area of investigation is variability in outcome, with numerous factors, both known and unknown, contributing to poorer adjustment. In Nigeria, Ohaeri et al. (1995), suggested from their study that worries over psycho-social consequences of sickle-cell disease, seem to add considerably to the burden of illness. With this in mind, the authors investigated three-predictor psychological variables-self-esteem, locus of control, and social support -and how these variables predict the mental wellness of adolescents suffering from sickle-cell anaemia and their patterns of adjustment.

METHOD

Participants: One hundred and fifteen adolescents clinically diagnosed sickle-cell anaemia patients participated in this study, with an average age of 23.1 years (SD=2.70), and an average hospital attendance of 5.40 years were sampled among sickle cell patients attending University College Hospital (UCH), Ibadan, Lagos University Teaching Hospital (LUTH) and General Hospital, Lagos.

Design and Instruments: This study employed a 2x2x2 factorial design which depicted the two levels of self-esteem (high and low), social support - (good and poor), and locus of control (internals and externals) and the dependent variable mental wellness and patterns of adjustment.

A questionnaire divided into six sections - A, B, C, D, E, and F was employed. Section A contained items tapping socio-demographic information, for example age, sex, education level etc. Section B contained items measuring self-esteem developed by Adanijo and Oyefeso, (1988). Responses choices was based on a likert type format with categories ranging from 1 standing for strongly disagree (which represent 5marks) to 5 standing for strongly agree (representing 1 mark). The instrument have been used among Nigerians among bank officials by Adanijo and Oyefeso with a split-half reliability of P, .01, N=420) and with a stability of 0.74 (P .01, N258 and 0.92 (P .01, N-258) among undergraduate and high school students respectively.

Section C contained items measuring social support developed by Sarason, (1980). This scale has 27 items each having two parts - SS (A) and SS (B). SS (A) was aimed at finding out the source of social support. The individual was receiving SS (B) was to determine the extent to which respondents were satisfied or dissatisfied with that particular source of support. The options ranged from 1-6 (1 - very dissatisfied and 6 - very satisfied). Sources of support include, father, mother, sister, uncle, aunt, husband, wife and others each representing 1 - 9 on the scale. Scoring was done in such a way that the higher the score, the more satisfied the respondent was with his/her social support and vice versa. Inter-item correlation, for the SSQ was determined by the other and ranged from 0.35 to 0.71 while test-retest reliability was 0.90. Section D contained items that measured health locus of control developed by Wallaston and Wallaston (1981). The 11-item scale was devised to measure the extent to which people attribute and feel their action affect their health. Reliability for the scale of 0.50 was established using Cronbach reliability coefficient alpha. A discriminant validity of 0.21 was also established.

Section E contained the Awaritefe Psychological Index (API), developed by Awaritefe (1982) with one thousand and one hundred psychiatric patients of varied description attending Neuropsychiatric hospital in Benin and one thousand and three hundred and seventeen normal subjects. The instrument is of clinical importance as a measure of general psychopathology based on a three point scale of yes, No and ? (Question mark) implying that the respondent is undecided; with scale values of 2,0,1 respectively. The instrument has three forms - A, B, and C. Only form A was used in this study which contained 114 items, measuring mental wellness in the following areas: sleep, intellectual, perception, heat, sensation of movement, mood, speech, motor behaviour, activity, head, alimentary tract and general somatic.

The API has been reported to correlate significantly with the MPI on the N scale (.49,P< .005). Also concurrent validity was established (Awaritefe, 1982, and Imade, T, 1986) on Nigerian subjects by correlating the scores on State Trait Anxiety Inventory (STAI) of Spielberger, Gorsuch and Lushene (1970) and Maudsley Personality Inventory (MPI) by Eysenck (1959). A significant relationship was found between API and MPI (N) for males (.42, P<. 01), API and MPI (N) (.51, P<. 01), API and STAI (.44, P. 01), API and STAI x-2, (.41, P,.01). The scale has also been validated among Nigerian prisoners, Idemudia, (1995,1998) with a split-half reliability of 0.89. Awaritefe (1982) reported the following consistency reliability (alpha coefficient = K-R20) of the API as .81. The retest reliability coefficient for both boys and girls combined was .85, for girls alone, .86 and for boys only .80.

The instrument according to Awaritefe (1982) is useful in the following ways: the appraisal of the level of severity of mental wellness at a given point in time; the assessment of the effect of therapeutic intervention; and the study of incidence rate of psychiatric morbidity in the general population.

Section E contained items measuring coping behaviour, which is an adaptation of the revised version of a scale developed by Folkman and Lazarus (1985) and revised by Folkman et al (1986). Response choice was based on a 1-point Likert scale ranging from 1=Does not apply/Not used, 2=used somewhat, through 3=used quite a

bit to 4=used a quite deal. The scale contained 50 items, sub-divided into eight sub-scales with each sub-scale measuring behavioural or cognitive activity. These sub-scales were classified into two broad categories problem-focused coping and emotional focused coping Psychometric properties were determined among sickle-cell patients in a pilot study, by item analysis yielding internal consistency with high alpha coefficients ranging from .50 -.78. Validity of the scale was ascertained by a multiple factor analysis with each factor obtained varying according to each problem area (i.e., sub-scales) and the explicit scales accounting for 50.4 percent variance. This scale has also been validated among Nigerian cancer patients by Idemudia and Balogun, (1995).

The questionnaire was administered on clinically diagnosed sickle cell out patients and hospital patients at U.C.H, LUTH and General Hospital, Lagos.

On clinic days, patients identified from their case notes, were given the questionnaire to respond to. Those who were half literate were assisted through interview method following the format of the questionnaire. Data was collected in the months of January to June 2001.

RESULTS

A 2 x 2 x2 factorial analysis of variance was performed on the data, and the results indicated a significant main effect for self-esteem, F (1,47)=108.948, P<. 001 and social support F (1,47)=10504.825, P<. 01, on mental wellness of sickle cell patients. (See Table 1).

This result revealed that sickle-cell patients with low self -esteem, manifested higher psychological symptoms than sickle- cell patients with high self-esteem. Also, sickle-cell patients with good social support showed less psychological problems than patients with poor social support.

Unfortunately, locus of control, which was expected to predict, mental health status of sickle-cell patients did not reach an acceptable level of statistical significance. But when locus of control interacted with self-esteem and social support it reached a very significant level, F (1,47)= 25.552,P<. 001.

An inspection of the cell means for significant interaction effect on self-esteem, social support, and locus of control for mental health status revealed that sickle cell patients with low self-esteem, poor social support and are externals (X=120.1,X=70.2,X=68.1) showed higher symptoms of psychological disorders than sickle-cell patients with high self-esteem good social support and are internals, (X=200.1; X=190.4; X=75.6).

A post hoc analytic comparison of these means using Turkey's Honestly Significance test (HSD), revealed significant difference between the means at P<.05, df=5, HSD=12.8, (Table 2)

On pattern of coping, self-esteem as a predictor variable revealed a significant main effect for problem-focused coping, F(1,47) =67.646, P<.001 (See Table 3).

Another predictor variable determining mental wellness and coping behaviour of sickle-cell patient was the presence of social support defined as the source of support an individual was receiving and the level of satisfaction the person is getting from the support.

Results in Table 3 also showed a significant main effect for social support on coping behaviour, F (1,47) =3.551, P<. 05.Sickle-cell patients with good social support, (X=193.4), adjusted better by adopting a problem-focused coping than sickle-cell patients with poor social support, (X=70.1)

On the satisfaction of source of social support patients received, sickle-cell patients with

Table 1: A summary of 2x2x2 factorial analysis of variance showing the effect of self-esteem, locus of control and social support on mental wellness of sickle-cell disease patients

Source of Variance	*Sum of Squares*	*Degree of Freedom*	*MS*	*F*	*P*
Self Esteem-A	4748.449	1	4748.449	108.948	.000*
L.O.C.-B	69.790	1	69.790	1.601	.212-ns
Soc.sppt.-C	457.825	1	457.825	10.504	.002***
A & B	527.562	1	527.562	12.104	.001*
A & C	135.846	1	135.846	3.117	0.84-ns
B & C	426.160	1	426.160	9.778	.003***
A&B&C	7795.630	1	1113.661	25.552	.000*
Error	2048.479	47	43.585		

*P<. 001, **P<. 005

Table 2: Summary of difference between pairs of means indicating source of interaction between self-esteem, locus of control, social support on mental wellness

	LEP	*HIG*	*LIP*	*HEG*	*HIP*	*LEG*
X SE/LOC/SS (LEP)	*	200.1	98.1	170.1	198.2	0
X SE/LOC/SS (HIG)		*	200.1	0	0	200.1
X SE/LOC/SS (LIP)			*	170.1	198.2	98.1
X SE/LOC/SS (HEG)				*	0	170.1
X SE/LOC/SS (HIP)					*	198.1
X SE/LOC/SS(LEG)						*

Where SE = self-esteem, LOC = locus of control, and SS = social support. P<. 05 (i.e. mean difference, 12.8 using HSD, revealed a significant difference between the means at P,.05, df =, HSD=12.8.

good social support identified, friends, spouse, and children as most favourable,(See Table 4)

Value A indicates the number of times respondents preferred each source. Value B showed the number of times a particular source of social support was not chosen. From the table, most of the social support sickle-cell patients preferred and got satisfaction, were from friends, spouses, and children. Many patients also preferred other sources, for example, aunts, uncles, and Government, but were not satisfied with the source of support. In other words, 89 percent of the patients did not get any support from the government. This is a rather sad observation because of the serious nature of the illness.

Locus of control -the extent to which sickle-cell patients feels and attributes actions to their health status-which was expected to predict mental wellness and coping behaviour, unfortunately, did not reach an acceptable level of significance. The indication of this is that, sickle-cell patients, whether they attribute their problems to luck, chance, fate or to themselves, have come to accept their circumstances as they are. But when locus of control as a variable interacts with other variables measured in this study, it becomes very significant (See Tables1&3), F (1,47)=25.552,P<. 0001, for mental wellness and F (1,47) =13.997, P<. 0001,for problem- focused coping.

Table 3: A summary of a 2x2x2 Analysis of Variance showing predictive value of self-esteem, locus of control and social support on problem-focused coping of sickle-cell patients

Variance	*Sum of square*	*DF*	*MS*	*F*	*P*
Self-esteem-A	101169.051	1	101169.051	67.646	.000*
LOC-B	16.524	1	16.524	.110	.742
Soc.Suppt-C	533.446	1	533.446	3.551	.056***
A&B	132.079	1	132.079	.879	.353
A&C	78.946	1	78.946	.525	.472
B&C	1097.723	1	1097.723	7.307	.010***
A&B&C	4719.781	1	4719.781	13.997	.000*
Error	704.201	47	150.238		

P<.001* .*P<.01* .****P<.05*

Table 4: Summary of valid percentage of support, source of preference, and the lack of it among sickle-cell patients

Source	*Value A*	*Value B*	*Valid percent*
No one	10	94	75.2
Parents	10	91	72.8
Sibling	23	70	56.0
Spouse	19	45	36.0
Friends	40	08	6.4
Grand children	13	99	79.2
Government	10	112	89.6
Aunt/Uncle	12	120	96.0
Children	12	48	38.4
Others	11	86	68.8

ing.

A perusal of table 5, also shows a correlation between self-esteem and social support. There is also a high correlation on API sub-scales and locus of control.

The above table indicates that seventy of illness on API sub-scales is higher in sleep disturbance, intellect, perception, heat, mood speech, Head and general somatic for social support and self-esteem. Only three of the twelve sub-scales (intellect, mood and General Somatic) were correlated with locus of control.

DISCUSSION

Results from this study showed that self-es-

teem and social support are good predictor variables of mental health and coping behaviour of sickle cell patients. However, locus of control can only be relevant when it interacts with other variables. In other words, sickle-cell patients with high self-esteem, good social support and are internals, i.e. attributes actions to themselves, rather than blame others, experienced less symptoms of psychological disturbances than sickle cell patients with low self-esteem, poor social support and are externals.

Although studies on sickle-cell diseased patients, currently is mixed at best, the findings on self-esteem, in this study, corroborates with the studies of Hurtig and White (1986), Whitten and Fishoff (1974) and Singler (1975). Hurtig and White (1986), found that frequently hospitalised sickle cell patients tend to have lower self-esteem, have external locus of control and have poorer personality social adjustment. Other researchers Singler (1975) described chronically ill patient like sickle-cell diseased patients, as fearful, non-verbal, bolated, and having damaged self-esteem, while, Whitten and Fishoff (1974) have also described the sickle-cell patients as having limited aspiration and poor self-esteem.

Social support defined as the source of support a sickle cell patient was receiving and the satisfaction derived from that source of support was investigated and was found to be a strong predictor of mental health status of sickle-cell patients and their coping pattern. The result revealed that sickle-cell patients with poor social support were psychologically disturbed than those with good social support. This finding supports several studies on social support and chronic illness not reviewed here. On the level of satisfaction derived from the source of support, results revealed that only friends, spouses and children provided adequate satisfactory social support for the subjects. Although other sources were also preferred, eighty-nine percent of the patients did not get any satisfaction from the government. For an incurable and costly disease like sickle-cell anaemia, one would expect that the government will be so concerned as to provide adequate assessment materials (medical and psychological), advance knowledge on preventive measures and awareness among its citizens, provide funds for intensive research on this subject just like it is practised with such illness like cancer, cerebrospinal meningitis etc. and provide funds for procurement of facilities for the treatment of sickle-cell disease.

The expected effect of locus of control on mental health and coping behaviour of patients was not supported but very significant when it interacted, with other variables in this study, indicating that sickle-cell patients with high self-esteem, good social support, and has internal locus of control, manifested less psychological disturbances and adopted a problem - focused coping than sickle-cell patients with poor social support, low self-esteem and external locus of control. The result, in part, supports Moise (1986) study, which he did with thirty-three sickle-cell subjects (age 8-16 years), and associated better adjustment with internal locus of control and positive self-concept.

CONCLUSION

This study investigated the effect of three independent variables, self-esteem, social support and locus of control on the mental health status and coping pattern of sickle-cell patients. Two of the variables - self-esteem and social support had significant main effect for both dependent measures - mental health status and coping behaviour. The third variable, locus of control has no significant main effect but had to interact with self-esteem and social support to reach a significant level on both dependent measures.

From this study conducted in three major hospitals in the south-western part of Nigeria, although self-esteem, social support and to some extent locus of control affects the psychological characteristics and coping behaviour of sickle-cell patients, other factors describing the characteristics of sickle-cell patients include feelings

Table 5: Summary table of correlation between SE, SS and locus on API sub-scales (A - L)

	A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*
SE	.27*	.49**	.26*	.36**	0	.42**	.47**	.38**	0	.42**	.35**	.45**
SS	.36**	.26*	.31**	.36**	-.29*	-.25*		.55**	.40**	.33**		.60**
LOC		.36**				-.26*						.28*

*P<. 01, **P<. 001 A = Sleep; B = Intellect; C = Perception; D = Heat; E = Sensation of movt.; F = Mood ; G = Speech ; H = Motor beh. ; I = Activity; J = Head; K = Alimentary tract; L = General somatic.

of helplessness, fear, and hopelessness.

In a study on the psycho-social aspects of sickle-cell anaemia in adolescents, Conyard et al (1983), confirmed that the psycho-social aspects of sickle-cell disease resemble those of other chronic illnesses, but that, this psycho-social profile does not have the same cultural, social and environmental impact on patients with other chronic disease that it has on patients with sickle-cell anaemia. The reasons they adduced, was that first, sickle-cell anaemia is primarily a disease of Black people; second, that most information concerning sickle-cell disease have short life spans, are unable to work, should not have children, and should not take part in activities such as sports. Third, that parents who have children with the disease experience feelings of guilt.

There is need therefore to carry out further therapeutic research among sickle-cell patients with the immediate family members which will include parents, children where methods of changing attitude, enhancing attitudinal values, promoting awareness in a focused group task-oriented approach.

Also, research should be encouraged to explore other variables of interest concerning sickle-cell patients particularly, the economic cost of sickle-cell disease. A disease of this kind, which most people believe, has a very short life span for sufferers, and very expensive to treat, and kills many youths before they reach their prime age can be frightening, when the economic cost is considered at the national level.

Government should try and improve on their poor role. They should make effort in reducing the prevalence of the disease and re-direct programmes towards prevention by bringing awareness to all and sundry. Because the disease is regarded as a Black Man's disease, the government should rely less on foreign aid and make genuine effort in alleviating and improving the well being of sufferers.

Health professionals - clinical psychologists, medical doctors, nurses should come together in a determined effort to combat this uncomfortable and untreatable disease and help them reach self fulfilment, enhance their sociability, develop their talents, relate to their peers and enjoy life, reinforce confidence and reach more of an emotional and social balance hence "normalcy".

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