

# Socio-Demographic Characteristics and Psychosocial Consequences of Sickle Cell Disease: The Case of Patients in a Public Hospital in Ghana

Vincent A. Adzika, Franklin N. Glozah, Collins S. K. Ahorlu

**Abstract—Background:** Sickle Cell Disease (SCD) is of major public-health concern globally, with majority of patients living in Africa. Despite its relevance, there is a dearth of research to determine the socio-demographic distribution and psychosocial impact of SCD in Africa. The objective of this study therefore was to examine the socio-demographic distribution and psychosocial consequences of SCD among patients in Ghana and to assess their quality of life and coping mechanisms. **Methods:** A cross-sectional research design was used, involving the completion of questionnaires on socio-demographic characteristics, quality of life of individuals, anxiety and depression. Participants were 387 male and female patients attending a sickle cell clinic in a public hospital. **Results:** Results showed no gender and marital status differences in anxiety and depression. However, there were age and level of education variances in depression but not in anxiety. In terms of quality of life, patients were more satisfied by the presence of love, friends, relatives as well as home, community and neighbourhood environment. While pains of varied nature and severity were the major reasons for attending hospital in SCD condition, going to the hospital as well as having Faith in God was the frequently reported mechanisms for coping with an unbearable SCD attacks. Multiple regression analysis showed that some socio-demographic and quality of life indicators had strong associations with anxiety and/or depression. **Conclusion:** It is recommended that a multi-dimensional intervention strategy incorporating psychosocial dimensions should be considered in the treatment and management of SCD.

**Keywords—**Sickle cell disease, quality of life, anxiety, depression, socio-demographic characteristics, Ghana.

## I.BACKGROUND

**S**ICKLE CELL DISEASE (SCD) is a genetic disorder found in individuals who inherit an abnormal gene in the haemoglobin from either parents [1]. The disorder follows a more severe clinical course among patients in Africa than it is for the rest of the world [2]. According to the World Health Organization (WHO), each year about 300, 000 infants are born with major haemoglobin disorders including more than 200, 000 cases of sickle-cell anaemia in Africa, with up to 2% of all children born with the condition located in sub-Saharan Africa [3]. The frequency of the trait is 15% to 30% in West Africa [3], and 2% of Ghanaian new-borns

have SCD [4]. This is an indication that SCD is a significant public health concern in Ghana. Extensive research has been conducted in on SCD in Ghana spanning several decades [5]-[7], but much more research is needed with respect to the psychosocial implications on patients.

It is known that life threatening diseases, such as heart disease, cancer, neurologic disorders, HIV/AIDS and sickle cell disease have severe psychosocial consequences on patients [8]-[10]. A non-linear relationship may also exist between psychosocial consequences and some medical conditions, where the psychosocial state of a patient could exacerbate SCD [9]. People with chronic illness have rates 3-4 times chances of developing mental health disorders than healthy individuals [11]. Sickle cell is a disease with sometimes distressing psychosocial and physiological complications having adverse effects on the physical and emotional wellbeing of the patients and their family [9]. SCD patients are also at risk of maladjustment to life in several functional areas, including emotional and behavioural problems, poor self-concept and interpersonal functioning and limited athletic abilities performance [12], [13]. In regard to this, [14] found that, among African-American adults, the odds of having significant depressive symptoms were much higher for those with severe forms of clinical SCD compared to the healthy population. In a Jamaica sickle cell cohort study, it was found that the prevalence of depression was 21.6% in SCD patients and 9.4% in controls [15]. This is corroborated by findings that African American adults with sickle cell disease reportedly experienced higher levels of depression (26%) or had depressive symptoms (32%) compared to only 9.5% of in the rest of the population [16]. The study concluded that all adults with chronic illnesses should be screened for depression at primary care practice sites where the diagnosis and treatment of depression needs to be properly coordinated [16]. A study has also demonstrated that SCD patients with severe and extremely severe anxiety report significantly higher proportion of vaso-occlusive crisis [17].

Health related quality of life (QOL) refers more specifically to the impact an illness has on the subjective well-being of patients [13]. Measuring the QOL has therefore become increasingly important in evaluating interventions, assessing prognostic factors, comparing therapies, and allocating resources [18]. Dampier et al. [19] found that there is a substantial impairment of health-related QOL in adults with SCD. The pain associated with the crises, and frequent

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hospitalizations have a significant impact on the QOL of patients [20]. In paediatric population, children with SCD have lower daily functioning capacity as well as physical limitations [21].

In individuals with health challenges such as SCD use various means to deal with their circumstance. This is referred to as coping mechanism, which has been defined as constantly changing cognitive and behavioural efforts to manage internal or external demand on individuals' personal resources [22]. In relation to SCD, patients adopt various coping mechanisms in order to deal with the crisis in their life. Coping through religion is multidimensional and individuals depend on religious help to cope with personal difficulty and stress, as seeking strength from God or supernatural being through prayer and meditation and associating with other believes in fellowship that may lead to renewed and deeper Faith in God or a supernatural being [23]-[25].

According to [26] the most frequent psychosocial problems in sickle cell patients are anxiety, depression, social withdrawal, aggression and poor interpersonal relationships. Even though advance in the biomedical management of SCD have been made by researchers in Africa, there is much to learn about the psychosocial consequences of SCD [2]. This is also the case in Ghanaian population in which much more is known about the psychosocial response of other diseases such as diabetes than for SCD. Furthermore, although treatment advances greatly improve the quality of life as well as the lifespan of patients, changes must be identified and taken care of in the management of the patient in an approach which, currently, is unsatisfactory [23]. When this has been done, research must now focus on response of SCD patients to psychosocial therapy interventions. The benefit of such treatment should be monitored. In this study we have examined the socio-demographic characteristics and psychosocial consequences of SCD in Ghanaian patients and attempted to incorporate these into the management of the SCD patient.

## II. METHODS

### A. Population and Sample

A cross-sectional survey design was used in the study. The population consisted of SCD patients at a sickle cell clinic in a major hospital in Accra. About 24, 010 patients attend this hospital in a year, 100 to 120 patients (both old & new) attending daily. A simple random sampling technique was used to select patients, from a list, who attended the hospital within the two months' period of data collection. Those willing to participate in the study and signed the informed consent form were recruited for the study. In all, 387 patients participated comprising of 180 males and 204 females. The age range was 18–65 years with a mean of 24.34 and standard deviation of 6.59.

### 1. Measurement of Depression

The Beck Depression Inventory (BDI) [27] was used to assess depression. This is a 21-item multiple-choice self-report inventory, widely employed in screening for both the presence and severity of depression. The BDI total score is the sum of the ratings for the 21 symptoms. Each symptom is rated on a 4-point scale ranging from 0 to 3. The scores range from 0 to 63. Higher scores indicate more severe depression. On scale, 0 to 9 represents minimal depression; 10 to 16 indicates mild depression; 17 to 29, moderate depression, and 30 to 63, severe form of depression. Among adult SCD patients, [28] found a Cronbach's alpha of 0.91 for the BDI. In the present study a Cronbach's alpha of 0.86 was found for the BDI.

### 2. Measurement of Anxiety

The Beck Anxiety Inventory (BAI), [29] is a 21-question multiple-choice self-report inventory that is used for measuring the severity of anxiety. The questions in this instrument are about common symptoms of anxiety the individual has had during the past four weeks. These symptoms include numbness tingling, sweating not as a result of hot weather or exercise, and fear of pending danger. The BAI total score is the sum of the ratings for the 21 symptoms. Each symptom is rated on a 4-point scale, 0-7 represents minimal anxiety; 8-15, mild anxiety; 16-25, moderate anxiety; and 26-63, severe anxiety. The BAI is psychometrically sound with Cronbach's alpha ranging from 0.92 to 0.94 [29]. In the present sample the Cronbach's alpha was 0.74.

### 3. Assessment of Quality of Life

The QOL index is a measure of an individual's quality of life through self-report of the importance they attach to each of 16 life domains on a 3-point rating scale as well as their current satisfaction with each domain on a 6-point rating scale [30]. The importance scores are multiplied by satisfaction scores for each domain. These scores are then added to determine the overall state of quality of life for the individual. This measure is quick to obtain and to compare with normed values from the community from which changes in individuals in the course of therapy can also be determined and tracked. Higher scores indicate higher quality of life [31]. The Cronbach's alpha for the present sample was 0.88.

### 4. Structured Clinical Interview

The structured clinical interview (SCI) is an instrument that helps a clinician to formulate questions to fit the patients understanding, to ask additional questions that clarify ambiguity and to challenge inconsistencies in answers provided as well as to make a judgement regarding the seriousness of symptoms presented. It is subjective and limited to diagnostic evaluations, research and the training of health professionals. The SCI adapted for the present study seeks information on major complaint, presenting problems, psychosocial history, individual medical history, family

medical history, previous treatment and current medical treatment. It is also designed to elucidate the coping strategies of the patient. Cronbach's alpha was not determined in the present sample as the questions listed were to solicit information about the participants.

#### B. Ethical Approval

The proposal was reviewed and approved by the Institutional Review Board of the Health Research Unit of the Ghana Health Service. Permission was subsequently sought from individual participants after explaining the aims and objectives of the study to them and obtaining a signed informed consent from each participant. As participants were patients in the hospital, a written permission was also sought from the Director of the Sickle Cell Centre and head of the Haematology department of the hospital. Participation was voluntary and responses provided were treated confidentially. Also, participants were identified by codes and not by name during data collection and analysis. It took close to an hour for participants to complete the questionnaires including the structured interview. Participants were given snacks and soft drinks for taking time to participate in the study.

#### C. Statistical Analysis

Prior to sampling participants, G\*power [32] was used to estimate the required sample size given alpha of 0.05, 95% power and effect size of 0.06. The resulting sample size was 336 participants. The Statistical Package for the Social Sciences (version 18) was used to conduct the statistical analysis. Descriptive statistics was used to estimate the prevalence of major psychosocial variables in the study and also to examine the socio-demographic distributions of these variables. Independent-samples t-test and analysis of variance were used to examine group differences in the socio-demographic variables on anxiety and depression. Post hoc analyses using Bonferroni test for significance was used when there were significant main effects in the independent variables. Multiple regression analyses were conducted with the socio-demographic characteristics and quality of life indices as independent variables and anxiety and depression as dependent variables respectively to determine the extent of variance in the dependent variables. Statistical estimates were assessed at the 0.05 level of significance.

### III. RESULTS

#### A. Socio-Demographic Characteristics of the Sample

Table I shows the socio-demographic characteristics of the sample. There were more females than males. Majority of the participants were between the ages of 20-29 years and most of them were single. Close to a third of the participants had a secondary or vocational school education.

#### B. Socio-Demographic Characteristics & Anxiety and Depression

Results of independent-samples t-tests showed that there were no statistically significant differences in (1) anxiety levels between males ( $M = 25.92$ ,  $SD = 10.57$ ) and females

( $M = 24.53$ ,  $SD = 10.84$ ),  $t(386) = 0.75$ ,  $p > 0.05$ ; (2) depression levels  $t(386) = 0.21$ ,  $p > 0.05$  between males ( $M = 16.03$ ,  $SD = 8.54$ ) and females ( $M = 15.04$ ,  $SD = 7.62$ ). Table II shows results of one-way analysis of variance conducted separately for anxiety and depression by age group, level of education and marital status. Results indicate that there were significant age group differences in depression scores but not in the anxiety scores. Post hoc analyses using Bonferroni test for significance in depression scores indicated that mean depression scores were significantly higher in the 40-49 year age group compared to the other age groups. Also, there were significant relationship between depression scores and education, but not with anxiety scores. Post hoc analysis using Least Significant Differences showed that the mean depression scores were significantly higher for those with primary level of education than for the other levels of education. Finally, one-way ANOVA results demonstrated that there was no relationship between either anxiety and depression and marital status (Table II).

TABLE I  
SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Characteristics	N	%
<b>Age group (n = 385)</b>		
<20	85	21.30
20-29	142	36.88
30-39	95	24.68
40-49	29	7.53
50-59	20	5.19
60+	14	3.64
<b>Gender (n = 384)</b>		
Male	180	46.88
Female	204	53.12
<b>Educational level (n = 382)</b>		
No education/Primary	28	7.33
Junior high/Form 4	96	25.13
Secondary/Vocational	166	43.46
Tertiary	92	24.08
<b>Marital Status (n = 372)</b>		
Single	312	83.87
Married	34	9.14
Divorced	26	9.68

#### C. Indicators of Quality of Life in Patients

In relation to the quality of life (QOL), patients were asked to indicate their level of satisfaction or dissatisfaction in 16 different dimensions of quality of life. Patients were generally dissatisfied with the quality of life they have and this was highest for health, self-esteem, goals and values as well as money in descending order (Fig. 1). This is even more compelling given that the proportion of indifference and satisfaction have similar levels. The levels of dissatisfaction with quality of life and/or satisfaction were similar across the four quality of life dimensions – work, play, learning and creativity (Fig. 2). The level of indifference was also similar across these four dimensions of quality of life.

TABLE II  
ONE-WAY ANOVA SHOWING SOCIO-DEMOGRAPHIC CHARACTERISTICS DIFFERENCES IN ANXIETY AND DEPRESSION

Characteristics	Anxiety				Depression			
	M	SD	df	F	M	SD	df	F
<b>Age group</b>								
<20	24.47	10.00			15.37	8.67		
20-29	26.55	10.54			15.86	8.15		
30-39	19.33	10.75	(5, 386)	1.65	15.19	7.49	(5, 386)	4.86**
40-49	37.75	2.23			24.50	4.36		
50-59	17.00	6.40			10.43	5.62		
60+	11.00	0.00			0.00	0.00		
<b>Educational level</b>								
No education/Primary	29.56	10.26			21.67	8.77		
Junior high/Form 4	27.00	11.55	(3, 386)	1.69	13.00	9.24	(3, 386)	5.24**
Secondary/Vocational	25.88	10.10			15.70	7.65		
Tertiary	23.13	11.46			13.84	8.25		
<b>Marital Status</b>								
Single	25.26	10.64			15.49	8.11		
Married	26.92	11.41	(2, 386)	1.06	17.75	9.39	(2, 386)	1.89
Divorced	36.00	0.00			26.00	0.00		

\*\* $p < 0.01$

TABLE III  
MAJOR COMPLAINTS/REASONS FOR VISITING THE HOSPITAL

Complaints	N	%
Bodily Pains/Back Pains	159	45.6
Malaria	57	16.3
Check Up	42	12.0
Others (e.g. wound, mouth sore, cough, swollen feet, etc.)	23	6.6
Fever/Vomiting	22	6.3
Dizziness	13	3.7
Abdominal pains/menstrual pains	8	2.3
Weakness	8	2.3
Headache	6	1.7
Crisis	5	1.4
Rheumatism	3	0.9
Typhoid fever	3	0.9

TABLE IV  
COPING MECHANISMS USED TO MANAGE CRISIS AMONG RESPONDENTS

Coping mechanism	N	%
Going to hospital/clinic	224	64.9
Take my medication, drugs, etc.	155	44.9
Believe (have faith) in God	114	33.0
Avoid people/withdraw from social activities/stop work	11	3.2
Try to avoid it/ take my mind off	11	3.2
Others e.g. psyche myself, encourage myself, etc.	11	3.2
Bath & sleep/relax	8	2.3
Call on friends/relatives	6	1.7
Take water/fruits	5	1.4
Go to church	4	1.2

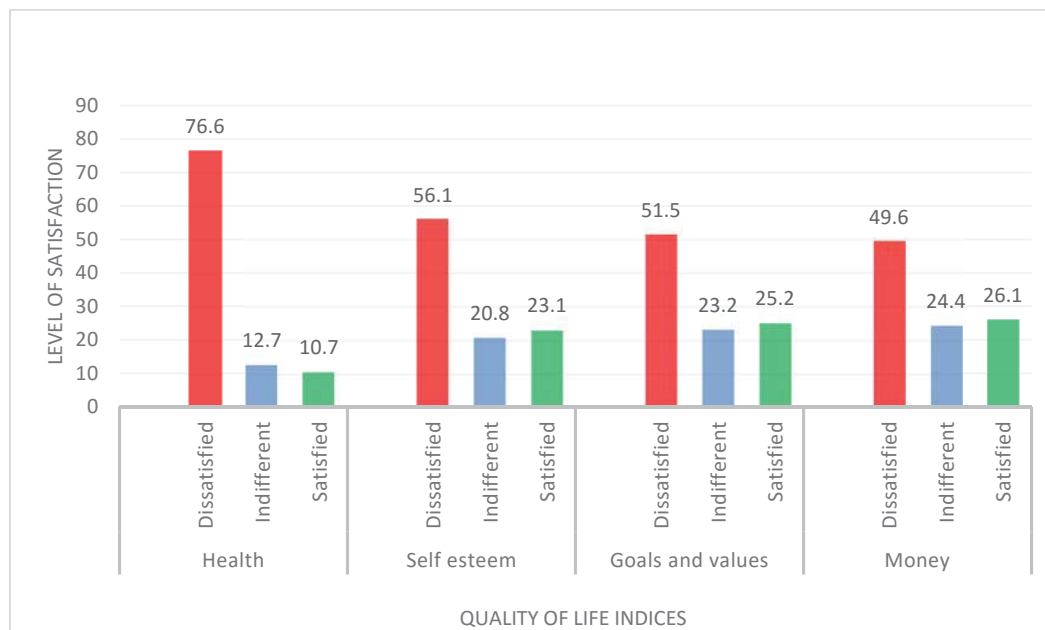


Fig. 1 Quality of life indicators: health, self-esteem, goal & values and money

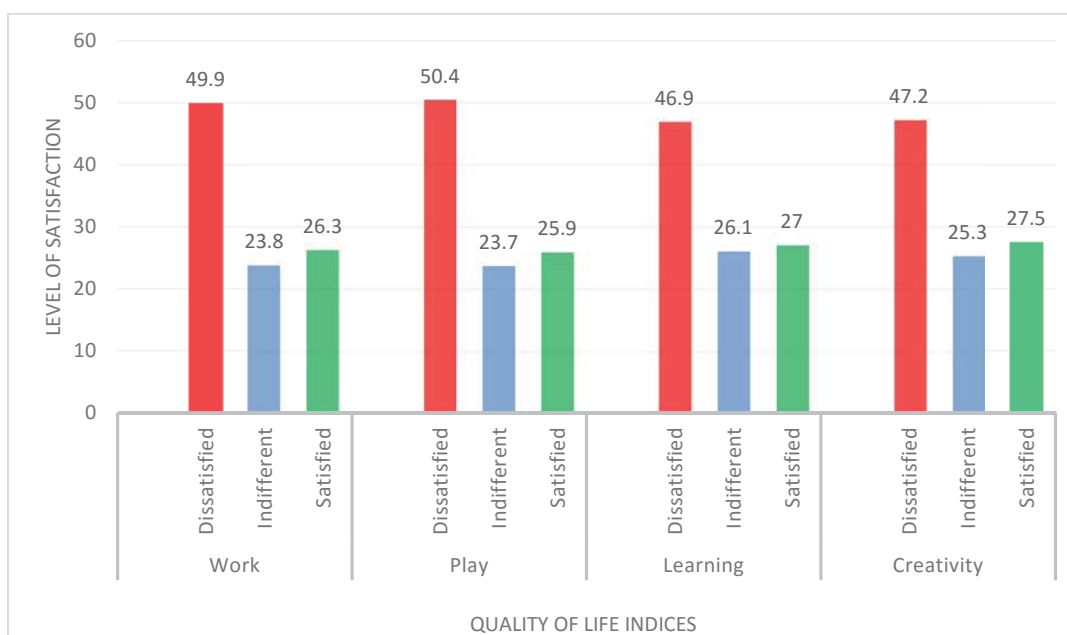


Fig. 2 Quality of life indicators: work, play, learning, creativity

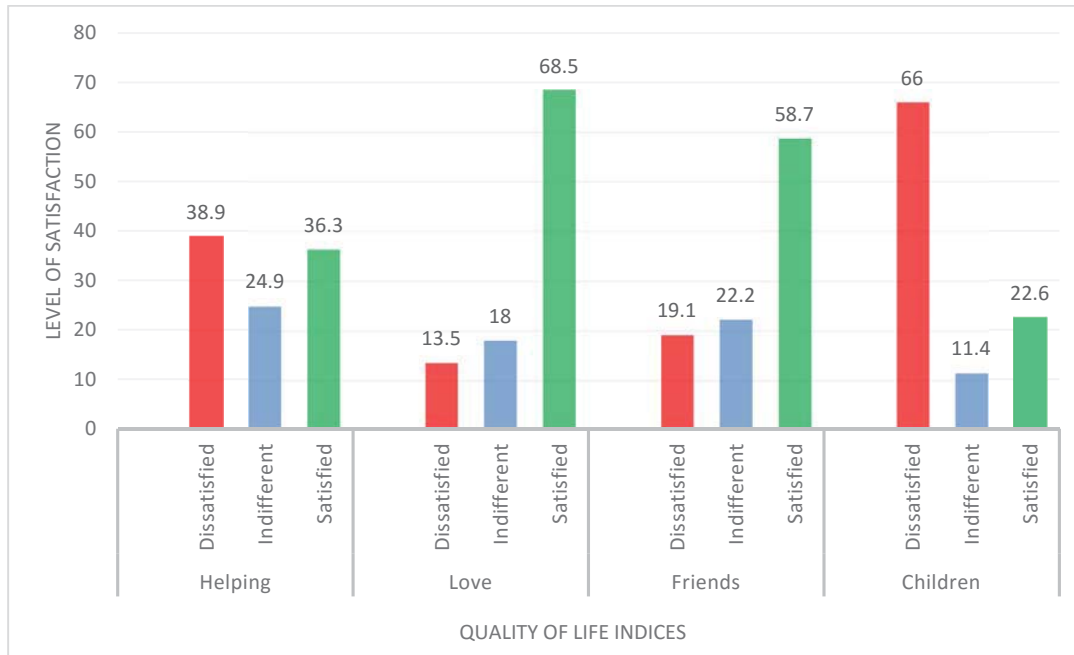


Fig. 3 Quality of life indicators: helping, love, friends and children

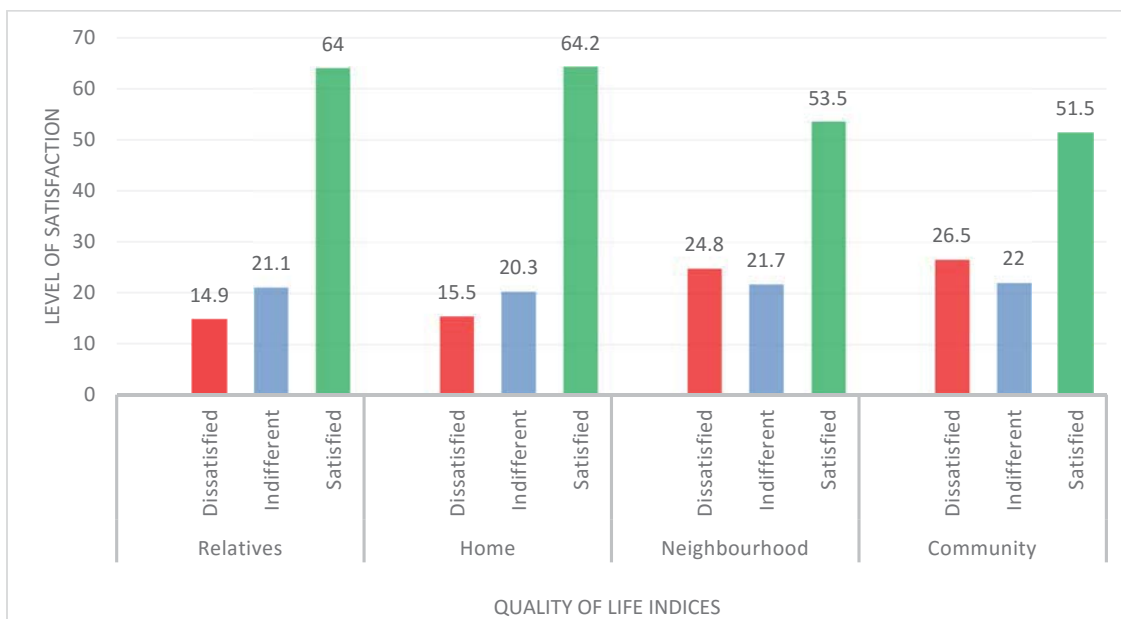


Fig. 4 Quality of life indicators: relatives, home, neighbourhood and community

Patients reported they were more satisfied than dissatisfied with love received and with friends. They were however more dissatisfied with their children and helping relationships (Fig. 3). Also, patients reported that they were more satisfied with their relatives, home, neighbourhood and community, indicative of their sense of belonging to the family or community (Fig. 4). Results of these 16 indicators of quality of life of patients measured demonstrate that patients were generally dissatisfied with their quality of life

with respect to the first eight areas (Figs. 1 and 2), and more satisfied with the last eight (Figs. 3 and 4).

#### D. Clinical Interview Indicators

Table III shows the reasons why patients visited the hospital. The highest reported symptoms resulting in hospitalisation was severe bodily pains and malaria and the least was in patients with alleged typhoid fever or rheumatism.



Seeking help at the hospital was the main coping mechanism whenever patients had a crisis (Table IV). Resorting to prayers at the church was the least reported coping mechanism. It was noted, however, that many relied on their personal touch with God as well as keeping to medication regime.

#### *E. Effects of Socio-Demographic Characteristics and Quality of Life Indicators on Anxiety*

Multiple regression analysis was used to test if the socio-demographic characteristics and quality of life indicators significantly predicted patients' anxiety. The results indicated that the predictors explained 36% of the variance. It was found that level of education, quality health, number of children and a conducive neighbourhood significantly predicted anxiety (Table V). This indicates that higher level of education, satisfaction with health, availability of children and quality of neighbourhood mitigate anxiety levels.

TABLE V  
MULTIPLE REGRESSION ANALYSIS SHOWING SOCIO-DEMOGRAPHIC CHARACTERISTICS AND QUALITY OF LIFE INDICATORS ON ANXIETY

	B	SE B	$\beta$	F	R <sup>2</sup>
(Constant)	24.41	2.77			
Sex	1.11	0.77	0.05		
Age	-.08	0.07	-0.06		
Education	-1.56	0.48	-0.15**		
Marital Status	0.94	1.63	0.03		
Health	-0.84	0.22	-0.26**		
Self Esteem	-0.36	0.34	-0.12		
Goals & Values	0.21	0.40	0.07		
Money	-0.26	0.40	-0.08		
Work	-0.09	0.49	-0.03		
Play	-0.63	0.46	-1.20	8.04**	0.36
Learning	-0.85	0.51	-0.27		
Creativity	0.68	0.50	0.21		
Helping	0.17	0.19	0.06		
Love	0.05	0.26	0.02		
Friends	0.06	0.25	0.02		
Children	0.68	0.21	0.21**		
Relatives	0.45	0.35	0.17		
Home	0.26	0.37	0.10		
Neighbourhood	-0.78	0.39	-0.29*		
Community	0.18	0.37	0.06		

\*  $p < 0.05$ , \*\*  $p < 0.01$

#### *F. Effects of Socio-Demographic Characteristics and Quality of Life Indicators on Depression*

The multiple regression analysis showed that the predictors explained 21% of the variance. It was found that age, health, money, learning, and creativity significantly predicted depression (Table VI). This indicates that getting older, satisfaction with health and ability to learn are negatively associated with depression. Also, an individual's satisfaction with their creativity and money is positively associated with their depression.

TABLE VI  
MULTIPLE REGRESSION ANALYSIS SHOWING SOCIO-DEMOGRAPHIC CHARACTERISTICS AND QUALITY OF LIFE INDICATORS ON DEPRESSION

	B	SE B	$\beta$	F	R <sup>2</sup>
(Constant)	38.25	4.07			
Sex	0.93	1.13	0.04		
Age	-0.26	0.10	-0.15**		
Education	-0.83	0.70	-0.06		
Marital Status	3.07	2.40	0.07		
Health	-0.84	0.32	-0.19**		
Self Esteem	-0.43	0.51	-0.11		
Goals & Values	-0.55	1.58	-0.13		
Money	1.23	1.58	0.28*		
Work	-0.06	0.71	-0.02		
Play	-0.22	0.68	-0.05	4.72**	0.21
Learning	-2.84	0.75	-0.65***		
Creativity	1.78	0.74	0.41*		
Helping	0.29	0.27	0.08		
Love	-0.41	0.39	-0.11		
Friends	-0.21	0.37	-0.06		
Children	0.40	0.31	0.09		
Relatives	0.75	0.51	0.20		
Home	0.18	0.54	0.05		
Neighbourhood	-0.06	0.58	-0.02		
Community	-0.28	0.55	-0.07		

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

#### IV. DISCUSSIONS

The aim of this study was to examine the socio-demographic characteristics and psychosocial consequences of SCD among patients in Ghana. The results revealed that there are no gender and marital-status differences in levels of anxiety and depression among patients. However, age and level of education impacted levels of depression but not anxiety. It was also noted that patients were more satisfied with loving relationships, presence of friends, relatives, as well as home, community and neighbourhood environments. It came to light that pain was common symptoms that led to seeking help from the hospital during SCD crisis. The next significant coping mechanism was their Faith in God. Lastly, socio-demographic and quality of life indicators had strong influences on the patients in regard to expression of anxiety and depression.

Our observation that gender and marital-status impacted levels of anxiety or depression differs from that of [33] in which gender and marital-status did not appear to influence levels of anxiety and depression. However, there was consistency in regard of age and level of education on depression among SCD patients [33]. It has been found that females generally complain more than males during illness [34]. Also, [35] found that marital status did not have any significant effect on depression. Cultural and gender role socialisation and expectations was expected to have accounted for gender and age differences in the present study. In Ghanaian culture, males are expected to show bravery, strength and endurance during times of crisis and is expected to be the bread winner and leader in their family [36]. Similarly, older people are also expected to be leaders

and be care takers of younger ones including females. Males and older individuals are therefore expected to report or complain less during SCD crisis, but this was not the case in this study. Perhaps, this may have been influenced by the fact that the sample comprised of more females and younger patients.

Our second observation that patients when in crisis were dissatisfied with their health, self-esteem, goals and values, and amount of money they have suggest that they were more satisfied with their ability to work, learn, play, be creative, and happy with friends. Dampier et al. [19] found that there is substantial impairment of health-related quality of life in adults with SCD who are in severe pain, hospitalised and are receiving blood transfusions. The factors that threaten the survival of SCD patients impact negatively on the quality of life of the patient [20]. Also, it has been asserted that paediatric population with SCD have lower daily functioning and general physical limitations [21]. This suggests that what constitutes the indicators of quality of life is universal, and therefore it is not surprising that what Ghanaian patients construe as quality of life is similar to that of patients in other countries or cultures.

Our observations are similar to those in previous studies that also found that the main reason why SCD patients visit the hospital was because of pain. Bloom [37], for example, found that abdominal and muscular pains were the main complaints presented by patients reporting at the hospital. According to [37], other coping mechanisms included avoiding people or withdrawing from social activities, stopping work, bathing and sleeping, relaxing with friends and relatives and taking their medication. Our survey showed that patients went to Church to seek help. Interestingly, however, a significant number depended on their personal Faith in God to cope with an unbearable SCD condition. It has been asserted that different coping mechanisms may help persons to adjust to their new conditions and follow recommendations [38]. Religious beliefs and going to a place of worship has been reported to have a positive impact in coping and also seen as a hopeful approach when individuals have difficulties with their health [24], very similar to the effects and role of praying [23]. In Africa, and Ghana for that matter, a large proportion of the population are religious and rely on their beliefs as well as prayers in times of difficulty, including SCD crisis.

Our finding that the level of education and quality of life indicators influenced anxiety is supported by [39] which showed that low educational levels are significantly associated with anxiety. Previous studies have found that neighbourhood socioeconomic distress emerged as a significant independent predictor of quality of life, and living in a distressed neighbourhood predicted diminished health related quality of life in SCD patients [13]. This suggests that educated individuals are more likely to be better informed about SCD and its management and outcomes and therefore experience less anxiety.

Again, while age and some individuals' quality of life such as having good health and ability to learn had a negative

association with depression, quality of life indicators such as creativity and having enough money were positively associated with depression. It has been asserted that depression has significant associations with functional impairment and quality of life [40]. Previous studies suggest that levels of family income impact depressive symptomatology [41]. Patients with low family income are more likely to be depressed than those endowed financially [35]. Olson et al. [42] have confirmed that depression is strongly associated with poverty.

Finally, anxiety and depression have been discovered as psychological complications of SCD with important consequences [43]. Having elevated depressive symptoms are higher for those with high clinical SCD severity compared to those without SCD [14], [15]. In addition, individuals with SCD experience higher levels of depression and depressive symptoms, indicating that all adults with chronic illnesses need to be screened for depression in primary care practice sites where the diagnosis and treatment of depression needs to be coordinated [16].

This study has a couple of limitations that is worth mentioning in order to serve as a guide for the design and conduct of future studies. First, given the relatively large number of patients who visit the hospital, selecting a much larger sample would have helped in increasing the generalisability of the findings of the study. Nonetheless, the sample size used for this study was enough with respect to statistical requirements. Second, a much more objective assessment of quality of life to corroborate the subjective assessment of satisfaction or dissatisfaction would have benefitted this study. Also, self-report measures, as was used in the study, may cause systematic measurement errors (common methods variance), and responses given by participants may not have been accurate. Finally, not including a control group as a basis to compare differences and relationships among the study variables limits our ability to generalise the findings therefore interpretation of the results should be done with due cognisance to this fact.

## V.CONCLUSION

This preliminary study reveals that socio-demographic characteristics and other indicators of quality of life play a major role in whether patients with life threatening diseases such as SCD will suffer anxiety and/or depression. These factors, that include levels of education, income, gender, and social relations, must be taken into account in the management of such patients to facilitate healing and restoration of quality of life. More of such studies are called for to gain a better insight into the impact of the psychosocial life of the patients and their families.

## COMPETING INTERESTS

The authors declare that they have no competing interest.



## AUTHORS' CONTRIBUTIONS

VAA conceived the research idea. All authors contributed to literature search, review and data analysis. VAA, FNG and CSKA drafted the manuscript. All authors contributed to writing as well as approved the final version of the manuscript.

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## REFERENCES

- [1] Oniyangi O, Omari AA. Malaria chemoprophylaxis in sickle cell disease. *Cochrane Database Syst Rev*. 2006; 4: CD003489.
- [2] Rees DC, Williams TN, Gladwin MT. Sickle-cell disease. *Lancet*. 2010; 376: 2018–31.
- [3] WHO. Sickle-cell anaemia. Annual Report: fifty-ninth world health assembly. Geneva: Author; 2006.
- [4] Kyerewaa EA, Edwin F, Etwire V. Controlling sickle cell disease in Ghana—ethics and options. *Pan Afr Med J*. 2011; 10:14.
- [5] Konotey-Ahulu FID. Computer assisted analysis of data on 1,697 patients attending the sickle cell/haemoglobinopathy clinic of Korle Bu Teaching Hospital, Accra, Ghana. *Ghana Med J*. 1971; 10:241.
- [6] Konotey-Ahulu FID. The Sickle Cell Disease Patient. London: MacMillan; 1991.
- [7] Konotey-Ahulu FID. Sickle-cell disease and the patient. *Lancet*. 2005; 365(9457): 382–3.
- [8] Brown BJ, Okereke OJ, Lagunju IA. Burden of health-care of carers of children with sickle cell disease in Nigeria. *Health Soc Care Community*. 2010; 18(3): 289–95.
- [9] Evans DL. Mood disorders in the medically ill: scientific review and recommendations. *Biol Psychiatry*. 2005; 58: 175–89.
- [10] Ehigie BO. Comparative analysis of the psychological consequences of the traumatic experiences of cancer, HIV/AIDS, and sickle cell anaemia patients. *IFE Psychologia*. 2003; 11:34–54.
- [11] Lewis M, Vitulano LA. Biopsychosocial issues and risk factors in the family when the child has a chronic illness. *Child Adolescent Psychiatric*. 2003; 12: 389–99.
- [12] Noll RB, Vannatta K, Koontz K, et al. Peer relationships and emotional well-being of youngsters with sickle cell disease. *Child Development*. 2007; 67: 423–46.
- [13] Palermo TM, Riley CA, Mitchell BA. Daily functioning and quality of life in children with sickle cell disease pain: relationship with family and Neighbourhood socioeconomic distress. *Journal of Pain*. 2008; 9: 833–40.
- [14] Laurence B, George D, Woods D. Association between elevated depressive symptoms and clinical disease severity in African-American adults with sickle cell disease. *J Natl Med Assoc*. 2006; 98:365–9.
- [15] Asnani MR, Fraser R, Lewis NA, Reid ME. Depression and loneliness in Jamaicans with sickle cell disease. *BMC Psychiatry*; 2010: 10.
- [16] Jenerette C, Funk M, Murdaugh C. Sickle cell disease: A stigmatizing condition that may lead to depression. *Issues Ment Health Nurs*. 2005; 26(10): 1081–101.
- [17] Mahdi N, Al-Ola K, Khalek NA, Almawi WY. Depression, Anxiety, and Stress Comorbidities in Sickle Cell Anemia Patients with Vaso-occlusive Crisis. *J. Pediatr Hematol Oncol*. 2010; 32(5): 345–49.
- [18] Panepinto JA, O'Mahar KM, DeBaun MR, et al. Validity of the child health questionnaire for use in children with sickle cell disease. *J Pediatr Hematol Oncol*. 2004; 26(9):574–78.
- [19] Dampier C, LeBeau P, Rhee S, et al. Health-related quality of life in adults with sickle cell disease (SCD): a report from the comprehensive sickle cell centers clinical trial consortium. *Am J Hematol*. 2011; 86: 203–5.
- [20] Pereira SAd, Brenner S, Cardoso CS, Proietti ABd. Sickle Cell Disease: quality of life in patients with hemoglobin SS and SC disorders. *Rev Bras Hematol Hemoter*. 2013; 35(5): 325–31.
- [21] Kater AP, Heijboer H, Peters M, et al. Quality of life in children with sickle cell disease in Amsterdam area. *Netherlands Journal of Medicine*. 1999; 143: 2049–53.
- [22] Hitchcock JE, Schubert PE, Thomas SA. Community health nursing. Caring in action. (2nd ed). Thomson/Delmar Learning, Clifton Park: NY; 2003.
- [23] Anie KA, Feyijimi EE, Olu OA. Psychosocial impact of sickle cell disorder: perspectives from a Nigerian setting: Globalization and Health. 2010; 6:2.
- [24] Uwakwe CBU, Kofie SA, Shokumbi WA. Sickle cell disease and the psychological adjustment of sufferers in a Nigerian Teaching Hospital. *Niger Med J*. 2001; 41(1):21–3.
- [25] Young C, Koopsen C. Spirituality, Health, and Healing: An Integrative Approach. Sudbury: Jones & Bartlett Learning; 2005.
- [26] Barakat LP, Lash L, Lutz MJ, Nicolaou DC. Psychosocial adaptation of children and adolescents with sickle cell disease. In R. T. Brown (Ed.), *Pediatric Hematology/ Oncology: A Biopsychosocial Approach*. New York: Oxford University Press; 2006.
- [27] Beck AT, Ward CH, Mendelson M, et al. An inventory for measuring depression. *Arch Gen Psychiatry*. 1961; 4:561–71.
- [28] Gallagher D, Breckenridge J, Steinmetz J, Thompson L. The beck depression inventory and research diagnostic criteria: congruence in an older population. *J Consult Clin Psychol*. 1983; 51(6):945–6.
- [29] Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: psychometric properties. *J Consult Clin Psychol*. 1988; 56: 893–7.
- [30] Frisch MB, Cornell J, Villanueva M, Retslaff PJ. Clinical validation of the Quality of Life Inventory: A measure of life satisfaction for use in treatment planning and outcome assessment. *Psychological Assessment: J Consult Clin Psychol*. 1992; 4: 92–101.
- [31] Frisch MB. Use of the Quality of Life Inventory in problem assessment and treatment planning for cognitive therapy of depression. In A Freeman, FM Dattilio (Eds), *Comprehensive Casebook of Cognitive Therapy* (pp. 27–52). New York: Plenum; 1992.
- [32] Faul F, Erdfelder E, Buchner A, Lang A-G. Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behav Res Methods*. 2009; 41: 1149–60.
- [33] Levenson JL, McClish DK, Dahman BA, et al. Depression and anxiety in adults with sickle cell disease: The PiSCES project. *Psychosom Med*. 2008; 70(2): 192–6.
- [34] Ilesanmi OO. Gender Differences in Sickle Cell Crises: Implications for Genetic Counselling and Psychotherapy. *J Psychol Psychother*. 2013; 3: 123.
- [35] Hasan SP, Hashmi S, Alhassen M, et al. Depression in sickle cell disease. *J Natl Med Assoc*. 2003; 95:533–7.
- [36] Ampofo AA, Boateng J. “Multiple meanings of manhood among boys in Ghana,” In *From boys to men: social construction of masculinity in contemporary society*. Landsdowne: University of Cape Town Press; 2007.
- [37] Bloom M. Understanding the Sickle Cell Disease: Jackson, MS: Mississippi University press; 1995.
- [38] Falvo D. Medical and psychosocial aspects of chronic illness and disability (2nd ed.). Gaithersburg, MD: Aspen; 1999.
- [39] Bjelland I, Krokstad S, Mykletun A, et al. Does a higher educational level protect against anxiety and depression? The HUNT study. *Soc Sci Med*. 2008; 66(6):1334–45.
- [40] Bair MJ, Robinson RL, Katon W, Kroenke K. Depression and pain comorbidity: a literature review. *Arch Intern Med*. 2000; 163:2433–45.
- [41] Schaeffer WJJ, Gil KM, Burchinal M, et al. Depression, disease severity, and sickle cell disease. *J Behav Med*. 1999; 22(2):115–26.
- [42] Olson SH, Iyer S, Scott J, et al. Cancer history and other personal factors affect quality of life in patients with hepatitis C. *Health Qual Life Outcomes*. 2005; 3:39.
- [43] Anie KA, Steptoe A, Ball S, et al. Coping and health service utilisation in a UK study of pediatric sickle cell pain. *Arch Dis Child*. 2005; 86: 325–9.