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THE PREDICTIVE INFLUENCE OF SELF-EFFICACY AND SOCIOECONOMIC FACTORS ON THE PHYSICAL AND MENTAL HEALTH-RELATED QUALITY OF LIFE OF ADOLESCENTS AND YOUNG ADULTS WITH SICKLE CELL DISEASE

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ABSTRACT: *Sickle cell disease (SCD), an inherited disorder of haemoglobin, is associated with severe physical and psychological burdens, both of which are influenced by a wide range of cognitive and socio-environmental factors. The current study aimed to establish the predictive influence of self-efficacy and family socioeconomic factors on the physical and mental health-related quality of life (HRQoL) of adolescents and young adults (AYA) with SCD. A cross-sectional study design was adopted, involving a sample of 116 AYAs with SCD, aged 16 to 24, recruited from two health facilities in South-West Nigeria. Participants completed assessments of SCD self-efficacy using the Sickle Cell Self-Efficacy Scale (SCSES) and HRQoL using the physical and mental component summary measures of the Short-Form 36 (SF-36). Family socioeconomic factors and socioeconomic status were evaluated using a Family Socioeconomic Status Scale adopted for the study. Multiple regression analysis indicated a significant joint influence of self-efficacy and socioeconomic factors on both physical and mental HRQoL, accounting for 64% variance in physical HRQoL and 66% variance in mental HRQoL. All evaluated variables, except home sanitation, independently predicted physical HRQoL, while all variables, except education and occupation, independently predicted mental HRQoL. Family possession, family-specific factors, and home sanitation were the most significant socioeconomic predictors of both physical and mental HRQoL. Moderation analysis indicated that socioeconomic status significantly moderated the influence of self-efficacy on mental HRQoL but not on physical HRQoL. The study highlights the need for exploring comprehensive and multi-faceted approaches in the management of SCD that go beyond medical treatment to address the broader social and psychological factors that influence physical and mental HRQoL.*

KEYWORDS: Sickle Cell Disease, Socioeconomic Status, Self-Efficacy, Adolescents and Young Adults, Health-Related Quality of Life

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INTRODUCTION

Health-Related Quality of Life (HRQoL) is a multidimensional concept that reflects a person's perceived and subjective, yet sometimes realistic, assessment of physical, mental, and social aspects of their life (Awonuga et al., 2022; Olapegba, 2020). The importance of focusing research on the physical and mental HRQoL of individuals with chronic illnesses has been well established (Gholizadeh et al., 2021; Ruscitti et al., 2022). However, certain chronic illnesses, such as sickle cell disease (SCD), have been largely overlooked in this context, despite their significant impact on global health and growing evidence of their localised burden among specific populations (Clayton-Jones et al., 2021; Kuerten et al., 2020; Pecker & Darbari, 2019).

Sickle Cell Disease (SCD) is a severe and life-threatening disorder of haemoglobin associated with devastating physical and mental impacts on patients and their caregivers. It is an inherited blood disorder marked by defective or abnormally shaped (sickle-shaped) red blood cells and is characterised by chronic haemolytic anaemia and vaso-occlusion, which lead to recurring episodes of severe acute pain known as 'crisis'. The disease affects several aspects of the patient's life, cutting across physical, mental, and social functions (Inusa et al., 2019; Salinas Cisneros & Thein, 2020; Sedrak & Kondamudi, 2022). For instance, patients with SCD typically experience an increased physical and psychological burden, including pain, fatigue, and sleep disturbance which are linked with depression and anxiety (Kilonzi et al., 2022; Osunkwo et al., 2021). Adolescents and young adults (AYA) with SCD, along with their caregivers consistently endure intense emotional and physical stress due to the impact of the condition, as well as lingering fears related to important life events such as marriage, childbirth, and death (Bioku et al., 2021; Mumuni et al., 2023; Saif et al., 2022; White et al., 2021). These challenges align with findings that report significant psychological difficulties among individuals living with SCD, including depression (7-36%) and anxiety (21-33%) (Al-Marzouki et al., 2021). Persistent depressive states among SCD patients have also been shown to worsen complications, leading to substance abuse and increased dependence on painkillers (Onyeaka et al., 2019). The prevalence of poor HRQoL among SCD patients significantly contributes to the overall disease burden (Kambasu et al., 2019; Osunkwo et al., 2021). For AYA patients with SCD, this period is especially important for determining their physical and mental health due to the dynamic challenges involved in the transition of care (Boucher et al., 2023).

The management of SCD is influenced by various factors, many of which are specific to the individual. The direct and indirect requirements for the management and care of the disease are substantial and widely spread, underscoring the need for research to identify core predictors of effective management (Hood et al., 2022; O'Brien et al., 2023). Among other predictors such as social support and self-care, self-efficacy and socio-demographic variables have been consistently associated with the management of SCD. Self-efficacy is primarily derived from an individual's retrospective beliefs, which may consciously and unconsciously influence their sense of competence in dealing with the illness (Lippke, 2020).

Self-efficacy is an important predictor of health outcomes and health behaviour among chronically ill patients (Chen et al., 2023). Self-efficacy provides a link between an individual's self-perceptions and health management actions, thereby serving as a mediator between health behaviours and health outcomes, as well as a significant construct in the management of chronic diseases (Al Raqaishi et al., 2022; Kanter et al., 2020; Torun et al., 2021). Higher levels of self-efficacy are associated with decreased severity of acute pain, reduced self-reported

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symptoms, increased use of adaptive coping mechanisms, and greater compliance with medical regimens. On the other hand, lower levels of self-efficacy are linked to increased symptoms, greater severity of pain, and a higher number of physician visits (Chen et al., 2023; Melin et al., 2023). In the context of SCD, higher levels of self-efficacy have been linked to fewer crises over a specified period. Also, self-efficacy and related beliefs account for differences in healthcare use, which in turn influences predictions regarding potential changes in SCD symptomatology (O'Brien et al., 2023). Although the specific psychological mechanisms underlying the roles of self-efficacy in the management of chronic illness have not been fully elucidated, self-efficacy has been strongly linked to the ability to enhance positive health behaviours and reduce the impact of stressors associated with chronic conditions like SCD (Ahmadi et al., 2023; Al Raqaishi et al., 2022; Su et al., 2023).

The management of SCD is also a complex, life-long process that requires multidisciplinary and integrated approaches to care, including daily medication, regular monitoring both within and outside healthcare settings, and critical lifestyle adjustments. As with most chronic illnesses, the effective management of the condition can be influenced by various socioeconomic factors, which, in turn, impact the HRQoL of patients (Pai et al., 2019). For AYAs with SCD, household or family socioeconomic factors are particularly relevant in understanding the impact of socioeconomic status on the patient's health and well-being (Beli et al., 2024; de Jesus et al., 2018). One key factor is household or family income. The complex demands of managing SCD, such as the rising costs of medications and frequent hospitalisations, can be particularly challenging for families with low income. Patients from low-income households have limited access to necessary healthcare services, which can lead to poorer physical and mental health outcomes, as well as lower self-efficacy (H. Khan et al., 2023; Nzekwue & Ogueh, 2022).

Given that existing studies show a lack of systematic investigation into how environmental factors affect cognitive beliefs of health and their direct impact on the mental and physical HRQoL of AYA individuals with SCD, the study aims to achieve the following key objectives: a). Determine the joint and independent predictive influence of self-efficacy and family socioeconomic factors (education and occupation of household heads or principal caregivers, family possession, economic stability, healthcare access and quality, home sanitation, and family-related factors), on the physical and mental HRQoL of AYAs with SCD; b). Determine the most significant family socioeconomic factors that influence the physical and mental HRQoL of AYAs with SCD; and c). Establish the moderating role of family socioeconomic status (SES) on the relationship between self-efficacy and physical and mental HRQoL of AYAs with SCD.

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MATERIALS AND METHODS

Research Design

Using the correlational analytical cross-sectional approach, the influence of self-efficacy expectations and HRQoL, as well as family socioeconomic factors was examined among AYA SCD patients. The study also involved the use of moderation analysis to examine the moderating role of socioeconomic status (SES) on the predictive influence of self-efficacy expectations on HRQoL within the given population.

Participants

The study focused on adolescents and young adults (AYA) with SCD in the southwestern region of Nigeria. Data was collected from SCD patients within the AYA age range (16-24 years) who were stable, meaning they had been crisis-free for at least one month prior to the study to avoid confounding effects related to ongoing morbidity. AYAs with SCD are faced with unique challenges that impact various aspects of their development and well-being such as physical, emotional, social, and educational well-being (Allen et al., 2022; Oberoi, Jacob, et al., 2022; Oberoi, Patterson, et al., 2022)

Sample

The study's sample consisted of 116 adolescents and young adult (AYA) with SCD, aged 16 to 24. Data were collected from out-patient AYAs with SCD, recruited through Sickle Cell Club groups affiliated with the University College Hospital, Ibadan, and Ring Road State Hospital, Challenge, Ibadan. These health facilities serve as referral centres for other hospitals within Oyo State, as well as neighbouring southwestern states, including Osun, Ondo, Ogun, Lagos, and Ekiti.

Measures

Self-Efficacy (SE): SE was assessed using the Sickle Cell Self-Efficacy Scale (SCSES), a nine-item self-administered questionnaire designed to measure disease-specific perceptions and beliefs regarding an individual's ability to manage day-to-day issues related to SCD, as well as effectively handle SCD symptomatology (Cronbach alpha = .89) (Edwards et al., 2000).

Physical and Mental HRQoL: The 36-item Short Form 36 Health Survey (SF-36) was used to assess the physical and mental HRQoL of the participants. Studies examining the reliability of the SF-36 report high internal consistency across its dimensions, with Cronbach's alpha coefficients ranging from 0.70 and 0.95. Estimates of reliability in the physical and mental sections are typically above 0,90.

Family Socioeconomic Status: To assess family socioeconomic factors and SES, the study used a family socioeconomic status (SES) scale, modified and standardised for the population, based on the family SES scale for health research introduced by El-Gilany, El-Wehady, and El-Wasify (2012). The modified family SES scale demonstrated strong test-retest and inter-rater correlation coefficients ranging between .81 and .97, with moderate internal consistency (Cronbach $\alpha = 0.69$).

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Statistical Analysis

Data analysis was carried out using the Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics were represented as frequencies and percentages, while normally distributed continuous variables were reported as means and standard deviations (±SD). Multiple linear regression analysis was used in evaluating the predictive influence of self-efficacy and socioeconomic factors on physical and mental HRQoL and in identifying the most crucial socioeconomic factors influencing HRQoL. Moderation analysis was employed in evaluating the moderating role of SES.

RESULTS

Sample Characteristics

The sample included 82 females (70.7%) and 34 males (29.3%) all of which were within the age range of adolescents and young adults as defined by the WHO (N=116). Consequently, the participants were within the ages of 16 and 24 (Mean = 21.2; S.D = 2.3). Participants were made up of individuals from the following ethnic groups: Hausa, 6(5.2%); Igbo, 26(22.4%); Yoruba 73(62.9%); and Other 11(9.5%). Distribution of education attainment of the participants include graduate, 4(3.4%); higher national diploma (HND), 4(3.4%); MPA. 1(0.9%); post-graduate, 22(19.0%); primary, 2(1.7%); secondary, 19(16.4%); and undergraduate, 64(55.2%). Participants included SCD patients with the HbSC genotype 26(22.4%) and the HbSS genotype 90(77.6%). The age of diagnosis of participants was identified at a mean value of 6.2 years and SD of 4.8. 80 participants (69%) had no other family member with SCD, while 36 participants (31.0%) had one or more family members with SCD.

Table 1: Sociodemographic Information of Sample Participants

		N	N%	Mean (x̄)	Median	Mode	Variance	SD
Gender	Female	82	70.7					
	Male	34	29.3					
	Total	**116**	**100**					
Age				21.2	22.0	22.0	5.4	2.3
Ethnicity	Hausa	6	5.2					
	Igbo	26	22.4					
	Other	11	9.5					
	Yoruba	73	62.9					
	Total	**116**	**100**					
Marital Status	Married	10	8.6					
	Single	106	91.4					
	Total	**116**	**100**					
Education	Graduate	4	3.4%					
	Higher National Diploma	4	3.4%					
	MPA	1	0.9%					
	Post Graduate	22	19.0%					

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	Primary	2	1.7%					
	Secondary	19	16.4%					
	Undergraduate	64	55.2%					
	Total	**116**	**100**					
SCD Type	HbSC	26	22.4%					
	HbSS	90	77.6%					
	Total	**116**	**100**					
Age of Diagnosis				6.2	5.0	1.0	23.2	4.8
Family Members with SCD	No	80	69.0%					
	Yes	36	31.0%					
	Total	**116**	**100**					
Number of Family Members with SCD				1.7				

Influence of Self-Efficacy and Socioeconomic Factors on Physical HRQoL

Multiple regression of the independent variables, including SCD self-efficacy and socioeconomic factors (education and occupation of household heads or principal caregivers, family possession, economic stability, healthcare access and quality, home sanitation, and family-related factors), was carried out against the sample's SF-36 physical component summaries (PCS) scores (Table 2).

Table 2: Summary of the multiple linear regression showing the independent and joint influence of self-efficacy and socioeconomic factors (including education, occupation, family possession, economic stability, healthcare access and quality, home sanitation, and family-related factors) on physical HRQoL

Predictors	**βeta**	**T**	**Sig.**	**R**	**R²**	**F**	**p**
				.64[a]	.51	9.29	<.01
SCD Self-Efficacy	.52	6.61	<.01				
Education	.10	1.25	<.05				
Occupation	.13	1.59	<.05				
Family Possession	.28	2.77	<.01				
Family-Related	.20	2.53	<.05				
Home Sanitation	.20	1.91	>.05				
Economic Stability	.03	.37	<.05				
Health Care	.03	.42	<.05				
df = 8,107							

The result of multiple regression to predict physical HRQoL essentially showed that these variables statistically significantly predicted physical HRQoL, $F(8,107) = 9.287$, $p < .0005$, $R^2 = .510$. All evaluated variables aside from home sanitation added statistically significantly to the prediction, $p < .05$.

This shows a significant joint influence of SCD self-efficacy, and socioeconomic factors [education, occupation, family possession, family related socioeconomic factors (includes

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family residence, number of family members, number of earning family members, and education of children), home sanitation, economic stability, and health care (access and quality)] on the physical HRQoL of adolescents and young adults with SCD [F(8,107) = 9.287, p <.0005, R= .640, R^2 = .510]. This implies that the multiple regression of the eight predictors highlighted showed a significant predictor relationship with the strength of .64 (64%) on physical HRQoL of adolescents and young adults with SCD. In other words, the predictors jointly accounted for 64% variance on physical HRQoL.

With reference to independent predictive roles, all the predictors [self-efficacy (β = .52, t = 6.61, p = <.01), Education (β = .10, t = 1.25, p = <.05), Occupation (β = .13, t = 1.59, p = <.05), Family Possession (β = .28, t = 2.77, p = <.01), Family Related Factors (β = .20, t = 2.53, p = <.05), Economic Stability (β = .03, t = .30, p = <.05), and Health Care (β = .30, t = .42, p = <.05)] independently predicted the physical HRQoL of adolescents and young adults with SCD, asides from Home Sanitation (β = .20, t = 1.91, p = >.05) as a socioeconomic factor.

Influence of Self-Efficacy and Socioeconomic Factors on Mental HRQoL

Multiple regression of the independent variables, including SCD self-efficacy and socioeconomic factors, was also carried out against the sample's SF-36 mental component summaries (MCS) scores (Table 3).

Table 3: Summary of the multiple linear regression showing independent and joint influence of self-efficacy and socioeconomic factors (including education, occupation, family possession, economic stability, healthcare access and quality, home sanitation, and family-related factors) on mental HRQoL

Predictors	βeta	t	Sig.	R	R^2	F	p
				.66[a]	.54	10.495	<.01
SCD Self-Efficacy	.47	3.33	<.01				
Education	.14	6.10	>.05				
Occupation	.12	1.80	>.05				
Family Possession	.25	1.54	<.05				
Family-Related	.30	2.53	<.01				
Home Sanitation	.21	3.85	<.05				
Economic Stability	.04	2.12	<.05				
Health Care	.07	.45	<.05				
df = 8,107							

The result of multiple regression to predict mental HRQoL essentially showed that these variables statistically significantly predicted mental HRQoL, *F(8,107) = 10.495, p <.0005, R^2 = .540*. All evaluated variables aside from educational and occupational factors added statistically significantly to the prediction, *p <.05*.

Essentially, from the foregoing presentations (Table 3) it has been shown that there is a significant joint influence of SCD self-efficacy, and socioeconomic factors on the mental HRQoL of adolescents and young adults with SCD [F(8,107) = 10.495, p <.0005, R= .663, R^2 = .540]. This implies that the multiple regression of the eight predictors highlighted showed a significant predictor relationship with the strength of .66 (66%) on mental HRQoL of

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adolescents and young adults with SCD. In other words, the predictors jointly accounted for 66% variance on mental HRQoL.

With reference to independent predictive roles, all the predictors [self-efficacy (β = .47, t = 3.33, p = <.01), Family Possession (β = .25, t = 1.54, p = <.05), Home Sanitation (β = .21, t = 3.85, p = <.05), Family Related Factors (β = .20, t = 2.53, p = <.01), Economic Stability (β = .04, t = 2.12, p = <.05), and Health Care (β = .07, t = .45, p = <.05)] independently predicted the physical HRQoL of adolescents and young adults with SCD, asides from Education (β = .14, t = 6.10, p = >.05) and Occupational (β = .012, t = 1.80, p = >.05) factors.

Key Socioeconomic Factors Influencing Physical and Mental HRQoL

From Table 2 and 3, the statistical significance of each socioeconomic factor can be denoted from standardised coefficients (βeta) as well as their level of significance (.sig).

From Table 2, Family Possession (β = .28, t = 2.77, p = <.01), Family specific variables [including family residence, number of family members, number of earning family members, and education of children (β = .20, t = 2.53, p = <.05)], and home sanitation (β = .20, t = 1.91, p = >.05) are the most statistically significant socioeconomic factors contributing to physical HRQoL of adolescents and young adults with SCD. All the socioeconomic factors [aside from home sanitation and including Education (β = .10, t = 1.25, p = <.05), Occupation (β = .13, t = 1.59, p = <.05, Economic Stability (β = .03, t = .30, p = <.05), and Health Care (β = .30, t = .42, p = <.05)] however contribute uniquely to physical HRQoL of adolescents and young adults with SCD, p<.05.

From Table 3, Family Possession (β = .25, t = 1.54, p = <.05), Family Specific Factors (β = .20, t = 2.53, p = <.01), and home sanitation β = .21, t = 3.85, p = <.05) also contribute most statistically significantly as well as uniquely to mental HRQoL of adolescents and young adults, p<.05;with SCD, with economic stability (β = .04, t = 2.12, p = <.05) and health care [access and quality (β = .07, t = .45, p = <.05)] only contributing uniquely to mental HRQo, p<.05.

Moderating Role of Family SES

Moderation analysis was carried out by calculating the standardised (Z-Score) of independent and moderator variables, followed by creating a new variable described as the "Interaction Term" by deriving the product of the derived standardised score. Multiple linear regression is carried out using self-efficacy as the dependent variable, and mental/physical HRQoL and Interaction Term as independent variables. Moderation is said to exist if there is a significant effect of self-efficacy, physical/mental HRQoL, and the interaction term.

Table 4: Summary of regression model showing moderation analysis of socioeconomic status as moderating the influence between self-efficacy and physical HRQoL

Predictors	βeta	T	Sig.	R	R^2	F	p
				.57[a]	.42	17.550	<.01
SCD Self-Efficacy	.557	6.941	<.01				
Socioeconomic Status	.002	.028	>.05				
Interaction Term	.-.057	-.732	>.05				
df = 3,112							

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Table 5: Summary of regression model showing moderation analysis of socioeconomic status as moderating the influence between self-efficacy and mental HRQoL

Predictors	βeta	T	Sig.	R	R^2	F	p
				.57[a]	.43	18.026	<.01
SCD Self-Efficacy	.476	5.965	<.01				
Socioeconomic Status	.216	2.708	<.01				
Interaction Term	.043	.552	<.01				
df = 3,112							

The results indicate that while socioeconomic status does not significantly moderate the influence of SCD self-efficacy on physical HRQoL [Self-Efficacy (β = .56, t = 6.94, p = >.05), Socioeconomic Status (β = .00, t = .03, p = >.05), Interaction Term (β = -.06, t = -.73, p = >.05)], there is a significant moderating role of socioeconomic status on the influence of self-efficacy on the mental HRQoL of adolescents and young adults with SCD [Self-Efficacy (β = .48, t = 5.97, p = <.01), Socioeconomic Status (β = .22, t = 2.71, p = <.01), Interaction Term (β = .04, t = .55, p = <.01)]. All evaluated variables for influence of self-efficacy on mental HRQoL added statistically significantly to the moderating role of socioeconomic status, p <.01.

DISCUSSION

The data provided evidence for the joint predictive influence of self-efficacy and identified socioeconomic factors on the physical and mental HRQoL of adolescents and young adults with SCD. Only a few studies have effectively identified the relationship between self-efficacy, social determinants of health, and health outcomes among SCD, particularly within AYA populations. In their cross-sectional study of 60 adults with SCD, O'Brien et al., (2023), found that perceived stigma and self-efficacy had significant relationships with the health outcomes, while health literacy did not. Also, self-efficacy partially mediated the relationship between perceived stigma and physical HRQOL, when controlling for depressive symptoms (O'Brien et al., 2023). In another study, statistically significant differences in self-efficacy based on age, marital status, level of education, and the number of years a patient had lived with SCD were established. This led to the conclusion that there was a positive statistical correlation between self-efficacy and self-care management among sickle cell patients (Nagshabandi & Abdulmutalib, 2018). With regards to the independent predictive influences of self-efficacy and socioeconomic factors, the data found the independent predictive role of self-efficacy on both physical and mental HRQoL to be consistently statistically significant relative to other independent variables considered in the study. This highlights the critical role of an individual's belief in their ability to manage SCD and the associated health management strategies they develop (O'Brien et al., 2023). This also provides essential evidence for the correlation between negative emotions, knowledge, perceptions, and beliefs about SCD severity and unpredictability, with negative QoL outcomes (Asnani et al., 2017).

The data also shows a significant predictive influence of all identified socioeconomic factors on physical HRQoL except for home sanitation. A wide range of family socioeconomic and sociodynamic variables have been predicted for several chronic health conditions across varying populations (Assari et al., 2019; Cronly et al., 2019; Modanloo et al., 2019). The study however further guides the position that the influence of socioeconomic factors on dimensions of HRQoL, at least within the overlaying context, are better generalised on any given similar

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population when considered jointly as opposed to individually. This implies that the impact of various socioeconomic factors on HRQoL may be context-dependent, and will exert their influence independently only in certain situations. For mental HRQoL, all evaluated socioeconomic factors, except for education and occupation, added significantly to the prediction. Since education and occupation are widely considered to be key socioeconomic factors, their failure to provide significant predictive value in the study may be linked to the context of the chronic illness, the fact that both factors relate only indirectly to the individual, the overshadowing effect of the physical and psychological burden of the disease, or the likelihood that other factors are more directly related to disease management and therefore have a greater impact on mental HRQoL.

This can also be discussed within the context of existing studies. In one study which evaluates stigma and quality of life in adults with SCD, being employed was associated with better quality of life. Reports of stigma (internalised stigma and expected discrimination) were associated with worse quality of life, while factors such as socioeconomic status and education were not significantly associated with the outcome (Bulgin et al., 2023). Essentially, self-efficacy and specific socioeconomic factors which determine SES have been examined as independent indicators of HRQoL among a moderate number of studies (Ahmadi et al., 2023; Gupta & Bokade, 2022; H. Khan et al., 2023; Nwagha & Omotowo, 2020; O'Brien et al., 2023). These variables have also formed key or covariant associations with other factors in a variety of studies on the HRQoL of SCD patients (Erhabor et al., 2022; Jonassaint et al., 2022; Korenhof et al., 2023).

The study showed family possession, family-specific variables (nature of residence, number of family members, number of earning family members, and education of children), and home sanitation as the most statistically significant predictors of physical and mental HRQoL. The SCT posits that learning occurs in a social context with a dynamic and reciprocal interaction of the person, environment, and behaviour. In the context of this study, the significant predictive role of family possession, family-specific variables, and home sanitation on both physical and mental HRQoL aligns with the SCT's emphasis on the environment's influence on health behaviour. These factors can be seen as part of the social environment that shapes the health behaviours of AYAs with SCD, influencing their ability to manage their disease effectively.

A wide range of socioeconomic determinants have been explored in the literature concerning the overall impact of socioeconomic factors and family socioeconomic status. In one study carried out on 116 adults with SCD (Nwagha & Omotowo, 2020), educational status was found to be the most significant sociodynamic factor affecting the HRQoL of the sample ($P = 0.013$). According to Cronin et al. (2019), the occurrence of missed appointments exhibited a significant association with admissions and readmissions. The study affirmed that age, mental health, financial instability, spirituality, and regular clinic attendance are all factors that can be modified and are associated with these health outcomes. In another study where family monthly income was classified into four categories ranging from the lowest (class 1) to the highest (class 4), it was revealed that the percentage of vaso-occlusive crisis (VOC) frequency and adverse events was higher among patients in social class 1 compared to those in classes 2, 3, and 4 (S. A. Khan et al., 2020). A greater proportion of children affected by the disease belonged to class 1, indicating a lower socioeconomic status. In one study evaluating the epidemiology and predictors of all-cause-30-day readmissions in patients with SCD (including physical and mental related causes), it was found that age group 18–30 years, discharge against medical advice, higher Charlson comorbidity index, low socioeconomic status and admission at high

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volume centres were associated with a higher likelihood of 30-day readmission (Kumar et al., 2020).

Family functioning as a key social determinant of health among young SCD patients has also formed a key area of consideration. One study investigated the relationship between biomedical and environmental factors (including family functioning and socioeconomic status) and executive functioning in a cohort of 22 preschool children diagnosed with sickle cell anaemia (Downes et al., 2019). The findings revealed that family functioning had the most significant impact on executive outcomes in young individuals with the condition. Interestingly, there was no evidence suggesting that disease severity influenced executive functions at this early stage (Downes et al., 2019). Another study identified socioeconomic factors as significantly associated with resilience in individuals with SCD. According to the study, those with lower resilience were more likely to be unemployed, unmarried, and less educated. Employment status was a significant predictor for mental and physical health, emotional distress, and perceived stress (Buscetta et al., 2022).

Finally, the study found that while socioeconomic status did not significantly moderate the relationship between SCD self-efficacy and physical HRQoL, it did play a significant moderating role in the relationship between self-efficacy and mental HRQoL. This can be explained by the cognitive nature of self-efficacy and its relevance to subjective evaluations of health. In this context, the moderating influence of SES may be more pronounced in the mental HRQoL dimension compared to the physical component. However, the mental and physical components of HRQoL remain significantly intertwined in existing explorations. In one study conducted through an online survey of 1339 patients with SCD over a two-year period, cognitive or mental aspects of health efficacy and mental HRQoL were identified as possible factors explaining why patients with lower SES exhibited a significantly greater frequency of missed appointments and hospitalisations compared to patients with a higher SES, with related effects on physical HRQoL (Ozdemir et al., 2022). Individuals with lower socioeconomic status (SES) have been found to experience higher disease severity which may be linked to mental aspects of HRQoL. Also, a wide scope of related studies have established a significant influence of SES on self-efficacy. This study itself demonstrates a highly significant predictive influence of self-efficacy on physical and mental HRQoL. Therefore, the moderating role of SES on the relationship between self-efficacy and physical HRQoL remains highly probable.

There is a need to further explore more factors among adolescents and young adults, who are at a critical stage of transition and management in SCD healthcare as well as a need for a wide range of provisions which address specific socioeconomic disparities that affect individuals with SCD, particularly adolescents and young adults. The highly substantiated interrelatedness of the physical and mental components of HRQoL, as well as the wide-ranging influence of SES on self-efficacy despite its cognitive nature, suggests possibilities for the indirect moderating influence of SES on self-efficacy and physical HRQoL through its mental component. This possibility facilitates a new area for further enquiry. Hence, the findings provide a solid foundation for future research and intervention development aimed at improving the HRQoL of adolescents and young adults with SCD. Future research should further explore these factors as well as confirm and expand on these findings.

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