Parental Information, Motivation, and Adherence Behaviors Among Children with Sickle Cell Disease

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Abstract

Background—Identification of psychosocial correlates of health care utilization has become an important strategy in improving clinical care. The objective of the study was to examine the fit of the Information-Motivation-Behavioral Skills (IMB) model, applied to health care utilization among children with sickle cell disease (SCD).

Procedure—Participants were parents of 150 children, ages 1 to 17 years, receiving care in a sickle cell center. Parents completed questionnaires assessing information, motivation, adherence behaviors, and other factors with respect to SCD management. Data regarding health care utilization in the previous 12 months were obtained from parent report and electronic medical records. Stepwise multiple regression analysis was conducted to determine associations between IMB factors and health care use.

Results—Parents rated highly in the domains of information, motivation, and adherence behaviors for managing their child's SCD. Children of parents reporting higher satisfaction with social supports had higher odds (OR 1.49, 95% CI 1.03–2.15) of 2 or more routine hematology visits in the previous 12 months. Neither information nor adherence behavior was associated with urgent or routine care use. Among other variables measured, high parental illness-related stress and child health status reported as fair/poor were the strongest predictors of urgent care use while private insurance type was the strongest predictor of routine care use.

Conclusions—Among IMB factors, social support was associated with routine health care utilization. Social support and parental illness-related stress may serve as important, modifiable targets in interventions to allocate needed resources to families and reduce unnecessary medical care.

Keywords

Sickle cell disease; Epidemiology; Outcomes research; Health Care Utilization

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Conflict of Interest Statement
The authors declared no financial interests related to this work.

INTRODUCTION

Sickle cell disease (SCD) is an inherited hemoglobinopathy that occurs in 1 in every 500 African-American births and 1 in every 1000 to 1400 Hispanic American births.[1] Clinical manifestations include vaso-occlusive pain crises, anemic episodes, infections, and stroke. [2,3] The care of children with SCD is marked by substantial utilization of costly health care services.[4] Increasing concerns regarding the rising costs of health care have prompted researchers to identify modifiable psychosocial factors associated with health care utilization.[5–8] The premise behind such efforts is that certain patterns of health care utilization are influenced by psychosocial factors in addition to aspects of the medical condition. While health status functions as an important determinant of child health care use, it only accounts for a portion of the variance in use of medical services.[5]

A limited number of studies have explored the relationship between parental psychosocial factors and health care utilization among children with SCD.[9–13] In a study by Logan et al., parental illness-related stress was the strongest predictor of both urgent and routine service use.[12] Additionally, parental SCD knowledge was related to higher frequency of routine service use. Overall, these previous studies have revealed relatively few psychosocial factors associated with health care use among children with SCD. There is still a need to identify other variables that may more comprehensively explain health care utilization.

Conceptual Model

To further assess the relationship between parental variables and child health care utilization, we adopted the Information-Motivation-Behavioral Skills (IMB) model. The IMB model has been validated with a number of health-related behaviors.[14–20] This model postulates that information, motivation, and behavioral skills are fundamental determinants of health-related outcomes such as utilization. Information is comprised of one's fund of accurate information concerning one's specific plan of care. Motivation is comprised of components of personal and social motivation, including perceived social support. Behavioral skills describe the competencies necessary to implement information and motivation across various circumstances. Higher information and motivation facilitate effective behavioral skills to improve health-related behavior.[21] In turn, behavior influences health outcomes. We modified the model to assess health care utilization among children with SCD (Figure 1). The IMB model asserts that additional factors may also influence outcomes. We identified parent illness-related stress and health literacy as additional variables to assess based on prior literature.[12]

The overall purpose of this study was to conduct a preliminary investigation of the applicability of the IMB model to health care utilization among children with SCD. First, this study sought to utilize existing survey instruments to describe the levels of information, motivation, and adherence behavior among parents of children with SCD. Second, we evaluated those factors for their potential utility in predicting health care utilization among children with SCD. We hypothesized that greater parental information, motivation, and adherence behaviors would be associated with lower urgent care use and higher routine care use.

METHODS

Study Design and Participants

Data for this cross-sectional study were drawn from a survey conducted among parents of children with SCD at Texas Children's Hospital (TCH). A questionnaire was utilized to collect demographic information, parent IMB ratings, and parent-reported health care

utilization. The study was approved by the Institutional Review Board of Baylor College of Medicine, Houston, Texas. Written informed consent was obtained for all participants.

Participants were 150 parents of children ages 1 through 17 years with a diagnosis of SCD who had documented visits at the TCH sickle cell center for a minimum of 12 months prior to recruitment. Eligible parents had children with a diagnosis of either hemoglobin SS Disease or sickle beta zero thalassemia. These included parents of children receiving outpatient or inpatient care. Exclusion criteria included parental (1) inability to comprehend English or (2) severe cognitive impairment.

Procedures

Parents were recruited during outpatient visits at the sickle cell center or hospitalizations. Research staff were present in the sickle cell center or rounded with the inpatient hematology service daily from October 15, 2010 to May 4, 2011. Prospective study participants were initially informed of the study by their child's provider (outpatient) or rounding team (inpatient) prior to recruitment. Prior to recruitment, all subjects were screened for eligibility. We attempted to recruit all subjects eligible for the study.

Measures

Urgent Care—The outcome measure of urgent health care utilization related to SCD in the past 12 months (aggregate of ED visits and hospitalizations) was measured using parent-report. Parent-reported visits to TCH were verified through comparison to the electronic medical record (EMR). Kendall's τ coefficients were assessed to determine the correlation between parent-reported utilization at TCH and EMR documentation of utilization. These correlated moderately: for frequency of ER visits, $r = 0.5$, $p<0.0001$; for hospitalizations, $r = 0.6$, $p<0.0001$. Given the overall accuracy documented by correlations, we used parent report of overall visits for data analysis, since that would capture utilization at both TCH and outside facilities.

Routine Care—To assess use of routine hematology care, we used chart review given that all visits would occur at TCH. According to national guidelines, children with SCD are recommended to have at least 2 routine care visits with a hematology provider per year.[1] Therefore, we scored routine care use as a dichotomous variable – either meeting the recommended 2 routine visits per year in the past 12 months or not.

Demographic Questionnaire—Child variables consisted of age, gender, and insurance status. Parental variables consisted of relationship to child, parent age, gender, marital status, and education. As there is no fully validated scoring measure to assess SCD severity[22], we used reported health status as a proxy. To assess health status, we used a previously validated question asking parents, "In general, how would you rate [CHILD'S NAME] health?"[23] Families were given the following options: poor, fair, good, very good, or excellent. We *a priori* categorized health status as fair/poor versus excellent/very good/good.

Information—Parents completed the Sickle Cell Disease Transition Knowledge Questionnaire (SCDTKQ). This instrument contains 25 multiple choice questions assessing SCD knowledge. The SCDTKQ has been used in prior studies. However, psychometric properties have not been well described.[24]

Motivation—Parental health motivation was assessed using two instruments. The Value on Health Scale (VHS) is a 5-item self-report measure of health motivation.[25] Respondents rate their motivation regarding specific aspects of health on a 4 point Likert scale of "not important at all" to "very important." The VHS has been used in prior studies.[26] For this

study, the questions were modified to assess a parent's motivation regarding their child's health rather than their own. Given this modification, we examined internal consistency in our sample. The internal consistency was calculated as α >0 .99 (N = 150).

The Social Support Questionnaire (SSQ) is a 27-item self-report measure used to quantify the availability and satisfaction with social support that an individual has.[27] Each item involves two parts: respondents are asked to list individuals that are available to them for help in individual situational circumstances, and how satisfied they are with the support available. Each circumstance allows a subject to list up to nine individuals. A six point rating scale (from "very satisfied to "very unsatisfied") is used to rate the individual's satisfaction with his/her support across all individuals for a particular item. A support score for each item is calculated by the number of individuals the subject lists (number score). The overall support score (SSQN) is calculated by the mean of the number score across items. The overall satisfaction score (SSQS) is calculated by the mean of the satisfaction scores for the 27 items. The SSQ shows both validity and reliability.[27]

Adherence Behavior—The Self Care Inventory – Sickle Cell (SCI-SC) is a parent report measure of adherence behaviors for SCD.[28] Respondents rate how well their child follows physician advice for 13 specific behaviors on a 5 point Likert scale. A validated instrument, the SCI-SC has been used previously in several cross-sectional studies.[24]

Additional Factors—The Pediatric Inventory for Parents (PIP) is a 42-item self-report that measures parental illness-related stress.[29] Each item is rated on two 5-point Likert scales assessing 1) frequency of each stressor and 2) how difficult the issue has been for the parent. Frequency and difficulty scores are determined for the overall total score. The PIP has been validated in previous studies.[29] Health literacy was assessed with the Short Test of Functional Health Literacy for Adults (S-TOFHLA).[30] The 36-point scoring scale of the S-TOFHLA is divided into three categories of functional literacy: inadequate (0–16), adequate (17–22) and functional (23–36). The S-TOFHLA has demonstrated adequate validity and reliability.[31]

Statistical Analysis

Descriptive statistics were generated to characterize the levels of information, motivation, and adherence behaviors among the study sample. The associations between IMB variables, demographics, self-reported health status, and health care utilization were preliminarily assessed using Pearson's zero-order correlations. Variables with associations $p < 0.25$ were selected to be entered into regression models.

For the purposes of the current analyses, the urgent and routine care variables were transformed. Urgent care utilization was calculated by aggregating the number of ED encounters and hospitalizations. Given the skewed distribution of urgent care events, a square root transformation was performed to establish a near-normal distribution and to reduce the influence of outliers. Routine care use was transformed into a dichotomous variable, 2 or more visits versus not. A series of stepwise multiple regression models were constructed to examine the relative contribution of IMB variables to health care utilization while controlling for demographic variables and child health status. For urgent care, linear regression was conducted, assigning the square root of aggregated encounters as the dependent variable. For routine care use, logistic regression was performed. Statistical analyses were performed using SAS® 9.2 (SAS Institute Inc, Cary, NC).

RESULTS

Descriptive Data

There were 150 children recruited. Of the total population, 137 children were recruited from the sickle cell center and 13 children were recruited from the inpatient service. No statistically significant differences were found between the groups in demographics or parent ratings of IMB variables. The participation rate among eligible families approached for the study was 77% (150/196). Demographics of the 46 families who refused participation showed no statistically significant differences with participating families (data not shown). The characteristics of the 150 parents and their children are shown in Table I.

IMB Factors—Table II provides descriptive information on each predictor variable. Parents reported high levels of SCD knowledge. The Sickle Cell Disease Transition Knowledge Questionnaire mean score for the sample was 21.4 (range 13–25). Parents also showed high levels of health motivation for managing their child's SCD. The mean score for the Value on Health Scale was 19.6 (range 15–20). For social support, the mean score for SSQN was 2.7 and the mean score for SSQS was 5.4. For the Self Care Inventory-Sickle Cell, the mean score was 4.3 (range 2–5).

For additional factors, the S-TOFHLA mean score was 34.8 (range 26–36) with all subjects meeting criteria for functional health literacy. For the Pediatric Inventory for Parents, there was a very strong relationship between the frequency and difficulty of stress total scores (r=0.9). The research literature on stress and coping demonstrates that frequency of stressors is more important than intensity in adaptive outcomes.[32] Therefore, frequency of illness-related stress variable was retained in subsequent multivariate analyses.

Health care utilization—Analysis of ED use showed that 35% of children (n=51) had no reported visits, while the majority (n=99) had 1 or more visits. The median number of reported ED visits was 2 encounters among children who had any visits (range 1 to 22 visits). Almost half of the children (n= 72) had no reported hospitalizations, while the remainder (n=78) had 1 or more. The median number of reported hospitalizations was 2 inpatient encounters among children who had any hospitalizations (range 1–12 hospitalizations). Overall, the number of events (ED and hospitalizations) was 465 encounters. Twenty percent of ED encounters and 8% of hospitalizations were reported to occur outside TCH. One-fifth of children (n=31) had no reported routine visits to hematology. Sixty-five percent of children (n=98) met the requirement of at least 2 routine visits to hematology in 12 months.

Associations between Parental Psychosocial Measures and Health Care Utilization

Urgent Care—According to Pearson's correlations, younger child age, public insurance status, younger parent age, and single marital status all demonstrated associations with higher urgent care use with p values <0.25 (Table III). Higher levels of urgent health care use were significantly associated with fair/poor child health status. Among additional factors, higher frequency of parent illness-related stress was also associated with greater urgent care use. No IMB factors were associated with urgent care use.

In the first step of the linear regression model for urgent care use, demographic variables (child age, insurance type, parent marital status) were entered (See Table IV). Given collinearity between child age and parent age, we chose to omit parent age from the model. The first step of the model demonstrated that younger child age was the only demographic variable that was a significant predictor of urgent care utilization (β=−0.20, p<0.05). The second step of the model investigated the relative contribution of parent-reported child

health status when added to the model. Results of the second step revealed that child health status was a significant predictor of health care utilization (R^2 Change 0.09, p<0.005). Health status reported as fair/poor was associated with higher urgent care utilization (β=0.84, p<0.005). In the third step of the model, parent illness-related stress was added. Results of the third step demonstrated that parent illness-related stress was a significant predictor of utilization (R^2 Change 0.13, p<0.005) and accounted for the largest portion of variance in the model. Higher frequency parental illness-related stress was associated with higher urgent health care utilization (β=0.12, p<0.005).

Routine care—According to Pearson's correlations, lower child age and private insurance demonstrated associations with higher routine care use with p values <0.25 (See Table V). Among parental IMB factors, social support, health motivation, and adherence behaviors were associated with routine health care use with p values <0.25. Health literacy was also associated with routine care use.

In the first step of the logistic regression model, child age, insurance type, and health literacy were entered. Only insurance type was found to be associated with routine care use. Children with private insurance had higher odds of 2 or more routine visits (OR 2.98, 95%CI 1.29–6.90). In the second step, adherence behavior was added. Adherence behavior was not associated with routine care visits. In the third step, social support and health motivation were added. Higher satisfaction with social supports was associated with higher odds of having 2 or more routine visits (OR 1.49, 95% CI 1.03–2.15). The increase in the c-statistic across steps of the regression showed improved model discrimination with social support included.

DISCUSSION

The primary aims of this study were to apply the IMB model to SCD and investigate relationships between IMB factors and child health care utilization. We conducted the study with the instruments currently available to measure IMB variables. Of the IMB factors, motivation in the form of satisfaction with social supports was the sole measure to show a relationship with routine health care use. Higher satisfaction with social supports was associated with higher odds of having 2 or more routine visits.

The results regarding the relationship between social support and routine hematology visits represent a novel finding among parents of children with SCD. According to the IMB model, social support may act a proxy for motivation. Perceived social support from others is a social factor that increases internal motivation, which in turn facilitates engagement in behavioral skills. When a patient perceives that significant others (e.g., family, friends) support them, he or she will enact specific adherence-related behavioral skills. The performance of these skills results in adherence behavior, which in turn, produces favorable health outcomes. Previous studies among parents of children with SCD have demonstrated social support as an effective coping mechanism and influential factor during stressful disease-related events.[33] However, no prior studies have documented a relationship between social support and health care use. Our results suggest that interventions based on increasing perceived social support[34] may provide a new strategy toward improving routine care use for children with SCD. Different types of support (e.g., emotional support, social support, physician support) have been shown to influence health related behaviors. [35] A recent study on social support among parents of children with SCD reported that mothers, physicians, the Internet, and books were important sources of support.[36] These specific factors may serve as potential targets in developing evidence-based social support inventions which do not currently exist for this population.

Contrary to our hypotheses, other parental psychosocial factors of our adapted IMB model did not demonstrate a relationship with child health care utilization. Parental information was not associated with routine hematology clinic visits, contradicting a prior study showing more accurate parental information to be associated with increased routine health care use. [12] Additionally, measures of parental health motivation and adherence behaviors did not show relationships with child health care utilization. There are several potential explanations as to why these components did not predict health care use. First, all families were recruited from a sickle cell center. Care in such a setting may especially emphasize parental education and motivation such that scores on the survey instrument would be positively skewed.

Second, our selected psychosocial instruments may be inadequate measures of their intended concepts. In previous studies, parental information has been measured with the Sickle Cell Disease Transition Knowledge Questionnaire, Sickle Cell Disease Knowledge Questionnaire, and a single-question rating of the parent's comfort with their knowledge of SCD.[12,24,37] The psychometric properties of these instruments are inadequately described in the literature. For health motivation, there are no instruments that assess this concept among parents of children with SCD. While the internal consistency of our modified VHS was excellent, 5 items with a Cronbach $\alpha > 0.99$ suggest overlapping and potential redundancy in instrument items. For adherence behaviors, we used the Self Care Inventory-SC, which may be biased by social desirability. Biases in self-reporting may also serve as an explanation for the contrary findings with respect to IMB factors. While information was objectively measured, motivation and adherence behavior were assessed with subjective instruments where caregivers could rate themselves favorably. Such biases in self-report may have positively skewed ratings for caregivers such that associations between IMB factors and health care utilization could not be adequately assessed.

It is possible that we did not include some potentially influential factors which would have strengthened our model.[38] Use of active coping by parents and children has been associated with less health service use. Coping strategies as a measure of behavioral skills may have increased the predictive capability of our adapted IMB model for health care utilization.[39] Lastly, it is possible that IMB factors are not the most robust predictors of health care use among children with SCD and other models are more appropriate.[13]

Our findings are consistent with previous studies demonstrating that children of parents with high parenting stress use health care services more frequently.[40,41] In a previous study, parental illness related stress experienced in raising an adolescent with SCD was the most robust predictor of health service use.[12] A small number of qualitative studies among adults with SCD also suggest that stress influences use.[42,43] In other studies, parents who have more illness-related stress tend to self-report fair or poor mental health status.[40] These linkages may allow for consideration of pharmacological or behavioral treatments to address these factors.

Several limitations of the study should be noted. First, information used to determine health status and health care utilization were primarily derived from parent report rather than clinical sources. While parental recall is potentially subject to recall bias, EMR review will not capture utilization at outside institutions. In future studies, administrative record review through payer databases should be utilized. A second limitation was that this study was conducted in a large tertiary center with variable attendance at routine care. We only recruited caregivers of children who had documented visits to the sickle cell center in the past 12 months. Caregivers who do not regularly access care for their children may be fundamentally different from the caregivers in the current study. Third, the structure of the SSQ may introduce response bias by first asking for a list of supportive individuals and then asking about satisfaction. It may be difficult for respondents to provide names and

subsequently state they are not satisfied. Finally, as this was a cross-sectional study, causality could not be established. We could not determine whether parental psychosocial factors influenced or were influenced by child health care utilization. Longitudinal, prospective studies will provide more reliable data on the relationship between parental psychosocial factors and child health care utilization.

Conclusions

While specific components of the IMB model may hold promise in identifying parental psychosocial factors influencing SCD health care utilization, the model as a whole was not supported despite adequate sample size and survey instruments. Future work should focus on identifying or constructing more applicable conceptual models to understand how psychosocial factors influence health care use for children with SCD.

Acknowledgments

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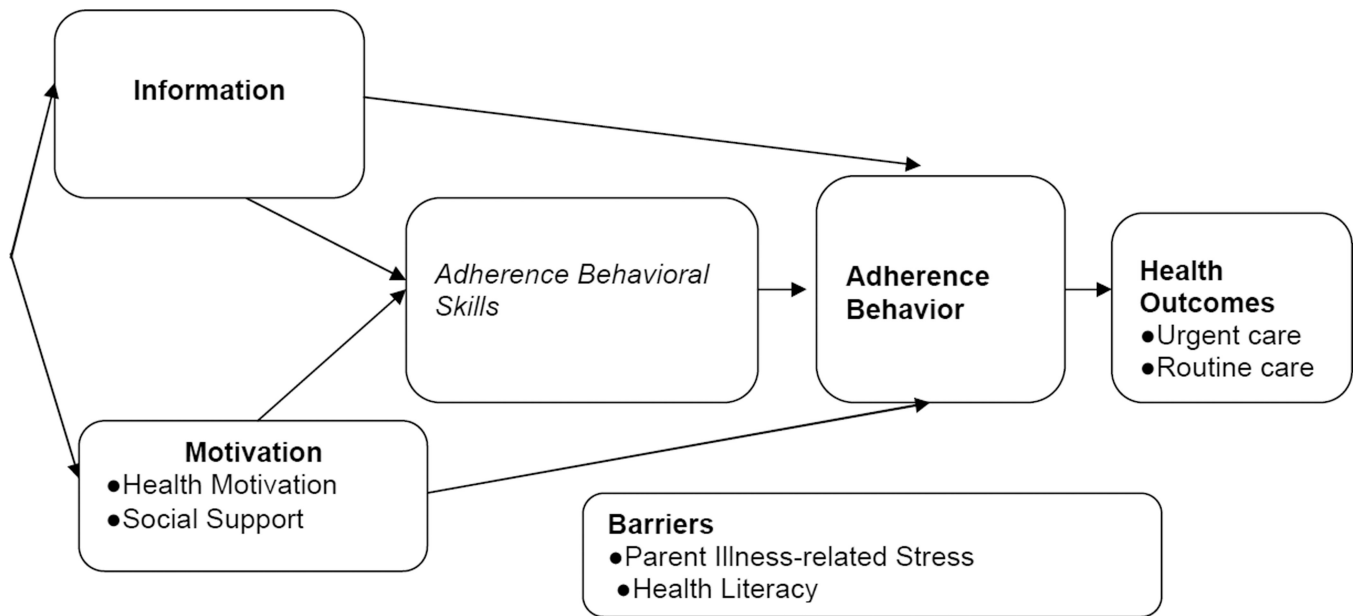
Figure 1. Adapted Information-Motivation-Behavioral Skills Model of Health Care Utilization for Children with Sickle Cell Disease
Adherence Behavioral Skills not measured due to lack of available instrument.

Table I

Study Population Demographics and Family Characteristics[a]

Variable	No. (%) N=150
Child Characteristics	
Age	
1–5	39 (26.0)
>5–9	46 (30.6)
>9–13	37 (24.7)
>13–17	28 (18.7)
Gender	
Male	79 (52.7)
Female	71 (47.3)
Insurance	
Public	94 (66.7)
Private	47 (33.3)
Health Status	
Fair/Poor	32 (22.2)
Excellent/Very Good/Good	112 (77.8)
Caregiver Characteristics	
Relationship to Child	
Parent	136 (93.2)
Other	10 (6.9)
Gender	
Female	133 (91.7)
Male	12 (8.3)
Marital Status	
Married	60 (41.1))
Other	86 (58.9)
Education	
High school or less	35 (24.0)
More than high school	58 (39.7)
College degree	53 (36.3)

[a] Individual categories may not add to 150 due to missing responses.

Table II

Parental Scores for IMB Factors

Measure	Sample Mean (SD)	Sample Range	Possible Score Range
Information			
SCDTKQ[a]	21.4 (2.9)	13–25	0–25
Motivation			
VHS[b]	19.6 (0.9)	15–20	4–20
SSQ Number[c]	2.7 (1.7)	0–9	N/A
SSQ Satisfaction	5.4 (1.1)	1–6	1–6
Adherence Behaviors			
SCI-SC[d]	4.3 (4.0)	2–5	1–5
Barriers			
PIP total frequency[e]	109.2 (31.0)	42–192	N/A
PIP total difficulty	97.3 (34.1)	42–193	N/A
S-TOFHLA[f]	34.9 (1.5)	26–36	0–36

[a]Sickle Cell Disease Transition Knowledge Questionnaire -Higher scores indicate greater knowledge

[b]Value of Health Scale- Higher scores indicate higher health motivation

[c]Social Support Questionnaire- Higher scores indicate greater support

[d]Self Care Inventory – Sickle Cell - Higher scores indicate greater adherence behaviors

[e]Pediatric Inventory for Parents- Higher scores indicate increased illness-related stress

[f]Test of Functional Health Literacy for Adults- Higher scores indicate greater health literacy; N/A – Due to scoring methodology, possible score range cannot be calculated

Table III

Zero-order Correlations between IMB Factors and Health Care Utilization

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demographics																
1. Child age	---															
2. Child gender	0.03	---														
3. Insurance type	−0.1	−0.06	---													
4. Health status	−0.06	−0.06	−0.01	---												
5. Parent age	0.35 ***	−0.01	0.13	0.04	---											
6. Marital status	−0.02	−0.17 **	0.35 ***	−0.09	0.03	---										
7. Education	0.05	−0.15	0.43 ***	0.1	0.19 **	0.25 ***	---									
Additional Factors																
8. Health Literacy	−0.1	−0.06	0.07	0.09	−0.02	0.15	0.28 ***	---								
9. Parental tress	−0.03	0.01	−0.11	−0.07	−0.07	−0.18 **	0.01	−0.03	---							
Information																
10. SCD Knowledge	0.05	−0.03	0.24 ***	0.06	−0.02	0.25 ***	0.43 ***	0.41 ***	−0.09	---						
Motivation																
11. Social Support Number	−0.21 **	−0.02	0.15	0.20 **	−0.11	0.04	0.07	0.16 **	−0.1	0.17 **	---					
12. Social Support Satisfaction	−0.08	0.02	0.08	0.08	−0.1	0.22 **	0.04	0.1	−0.15	0.05	0.30 ***	---				
13. Health Motivation	−0.05	−0.02	−0.01	−0.03	0.08	−0.02	0.05	−0.05	−0.15	0.04	0.01	−0.01	---			
Behavior																
14. SCD Adherence Behavior	0.04	−0.07	−0.06	0.03	−0.06	−0.07	−0.03	−0.03	0.09	−0.02	−0.06	0.07	0.04	---		
15. Urgent care	−0.15 *	0.02	−0.10 *	−0.27 **	−0.13 *	−0.15 *	0.03	0.08	0.36 **	0.04	0.04	0.03	−0.1	−0.09	---	
16. Routine care	−0.10 *	−0.03	0.17 **	−0.07	−0.05	0.06	0.03	0.16 *	0.03	0.04	0.18 **	0.16 *	0.11 *	−0.13 *	0.34	---

*
$p<0.25$

**
$p<0.05$

***
$p<0.005$

Table IV

Stepwise Multiple Regression Analysis to Predict Urgent Care Utilization

Predictor variables	β (SE)[a]	R^2	R^2 Change	F Change
Step 1 – Demographics		0.04	0.04	2.13
Child's age	−0.20 (0.11)[*]			
Insurance Type	0.19 (0.22)			
(Private v. Public)				
Relationship Status	0.27 (0.21)			
(Not married v. Married)				
Step 2 – Illness severity		0.13	0.09	5.16[**]
Health Status	0.84 (0.23)[**]			
(Poor/Fair v. Good/VG/EX)				
Step 3 – Additiona Factors		0.26	0.13	8.31[**]
Illness-related Stress	0.12 (0.03)[**]			

[*]
p<0.05

[**]
p<0.005

[a]Estimates are specific to the step that each variable was first entered

Table V

Stepwise Multiple Regression Analysis to Predict Routine Care Utilization

Predictor variables	OR (95%CI)[a]	AIC	AIC Change	c-statistic
Step 1 – Demographics/Additional Factors		180.30	180.30	0.64
Child's age	0.80 (0.53–1.22)			
Insurance Type				
(Private v. Public)	2.98 (1.29–6.90) [*]			
Health Literacy	1.10 (0.87–1.40)			
Step 2 – Behaviors		177.69	−2.61	0.63
Adherence Behaviors	0.94 (0.81–1.10)			
Step 3 – Motivation		170.95	−6.74	0.70
Social Support Number	1.13 (0.86–1.44)			
Social Support Satisfaction	1.49 (1.03–2.15) [*]			
Health Motivation	1.35 (0.91–2.01)			

[*]
p<0.05

[a]Estimates are specific to the step that each variable was first entered