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Impact of Nursing Instructions Protocol on Health Promotion Lifestyle for Patients with Sickle Cell Anemia at The New Valley

Huwaida Abdul Dayem Khalaf[1] & Mimi M. Mekkawy[2] & Asmaa S. Abd- Almageed[3].
1. Inspector of Nursing in Directorate of Health In Affairs the New Valley, Egypt.
2. Professor of Medical Surgical Nursing Faculty of Nursing Assiut University, Egypt.
3. Assistant Professor of Medical Surgical Nursing Faculty of Nursing Assiut University, Egypt.

Abstract
Background: Sickle cell anemia (SCA) is a hereditary chronic genetic blood. **Aim:** To evaluate the impact of nursing instructions protocol on health promotion life style for patients with sickle cell anemia. **Research design** Quasi-experimental research design. **Setting:** New Valley (El Kharga general hospital). **Patient and Methods** Thirty adult patients with sickle cell anaemia. **Tools:** "Structured interview patient questionnaire". **Tool (II):** Health promotion Model – Instruments to measure health promoting lifestyle. **Results**: More than half of the studied sample was male with mean age (27.96±8.84). There was a highly statistically significant difference in the Patients' health promotion was increased after the implementation of the booklet; particularly in the areas of the health responsibility, physical activity, nutrition and Non-significant difference in interpersonal relations. **Conclusion:** The study findings supported all research hypotheses as it had been proven that the nursing instruction protocol had statistical significant effect on minimizing pain and improving health promotion lifestyle. **Recommendations:** It is important to educate patients about how to modify life style to healthy life, relieve and manage sickle cell anemia complications.

Key Words: Sickle Cell Disease, Nursing Instructions & Health Promotion Life Style.

Introduction
Sickle-cell disease (SCD) is a group of genetic disorders characterized by abnormally shaped red blood cells (RBCs), which are destroyed at increased rates, leading to anemia **Abdurrahman et al., (2018).**
Sickle cell disease (SCD) is a group of inherited red blood cell disorders. Patients with SCD experience acute painful episodes (crises) superimposed on persistent (chronic) pain **Darbari et al., (2016).** Pain is a prominent feature of SCD that starts early in life and increases in severity with age **Dampier et al., (2014).**
Sickle cell anemia (SCA) is a hereditary chronic genetic blood and a wide spread autosomal recessive disorder, abnormal, c-shaped or sickle-shaped; hemoglobin molecules impede circulation through the blood vessels **Olowoyeye & Okwundu (2010**).
Sickle cell anemia(SCA) is a genetic blood disease due to the presence of an abnormal form of hemoglobin, namely hemoglobin S. Hemoglobin is the molecule in red blood cells that transports oxygen from the lungs to the farthest areas of the body. Sickle cell disease is caused by an alteration in a single DNA base, but its clinical manifestations are influenced by other genes and behavioral and environmental factors. Recent findings may indicate acceleration in the discovery of interventions that alter the disease course **Piel et al., (2017).**
The disease is characterized by abnormally shaped Red Blood Cells (RBCs), which are removed from circulation and destroyed at increased rates, leading to anemia. In addition to mentioned clinical features, the distorted RBCs also cause vascular occlusion, leading to haemolysis and tissue infarction **Chatterjee et al., (2018).**
Health promotion lifestyles refer to the behaviors of individuals, families, communities, and societies forwards the promotion of peace, happiness, and the realization of health potential, that is, any activity that one may take to achieve a higher level of health, self-realization, peace and happiness **Pender (2011)**.

Significance of the study
In The New Valley El-kharga general hospital through year 2016, it was found that there were (twenty nine) patients with SCA admitted to medical department, while in year 2017, it was found that there were (forty) patients with SCA admitted to medical department. EL-kharga Hospital Records (2017). From the researcher's clinical training in this department; the researcher observed that many SCA patients admitting to medical department with fatigue , anemia, Pain crises and arthritis and this affect on their health life style .so this study will be conducted to promote life style of those patients.

Aim of the Study
The aim of this study is to evaluate the impact of nursing instructions protocol on health promotion life

style for patients with sickle cell anemia at New Valley.

Hypothesis

- Health promotion life style for patients with sickle cell anemia will be improve after exposing to nursing instructions protocol.
- Pain score for patients with sickle cell anemia will be decrease after exposing to nursing instructions protocol.

Sample & Method

Research design

Quasi-experimental research design was utilized in this study

Setting

The study was conducted in the medical department & outpatient clinics at The New Valley (El- Kharga general hospital).

Sample

A total of thirty (16 males and 14 female) adult patients diagnosed with sickle cell anemia, their mean age was 27.96±8.84 years for the study patients, the age ranged between (18-65) years and able to participate in the study and haven't any chronic illness.

Tool of the study

Tool I: Patient assessment sheet: It included three parts

Part I: Socio-demographic data (age, gender, marital status, level of education, occupation, health and family history).

Part II: Clinical data included (length of hospital stay and duration of illness).

Part III: Pain Assessment (It assessed by pain assessment scale. The numeric rating scale (NRS) is a single 11-point numeric scale broadly validated across myriad patient types.by **Hartrick et al., 2003).**

1• 0=no pain
2• 1–3 = mild pain
3• 4–6=moderate pain
4• 7–10 = severe pain

Tool (II): Health promotion lifestyle (HPLII) Pre / Post

The Health Promotion Model – Instruments (in English) was developed and revised by **Walker et al., (1987).** To measure health promoting lifestyle of patients with SCA, The HPL the reliability and validity of the translated version have been demonstrated. Health promotion - instrument has 35 items to measure health promoting lifestyle categorized into four health-promoting lifestyle subscales: (1) Health responsibility (HR), (2) physical activity (PA), (3) interpersonal relations (IR) and (4) nutrition (N). Four-point response scale consisting of 1 = never, 2 = sometimes, 3 =often, and 4 = routinely were used to determine the frequency of each behavior. A mean of (>2.50) was considered to be a positive response **Wei et al., (2012)**.

Procedure

The study proceeded using the following phases:

Preparatory phase

Tools development: A review of current and past, local and international related literature in the various aspects using books, articles, periodicals and magazines were done.

Ethical approval

Permission to carry out the study was obtained from the ethical committee of the Faculty of Nursing. An official letter was issued from the dean of the faculty of nursing, Assiut University, was prepared and delivered to the director of El- Kharga general Hospital at The New Valley asking for permission to collect the necessary data for this study. The researcher emphasized that the participation was voluntary and the patients had the right to refuse to participate in the study and can withdraw at any time. Verbal consent was obtained from each patient prior to his/ her contribution in the present study. Confidentiality and anonymity of any obtained information was assured through coding of all data.

Content validity and reliability

To achieve validity of the tools, it will be reviewed by experts (5 nursing staff) in medical department in the field of the study and necessary modifications will be done. The final form of the tool was designed and tested for reliability by using internal consistency for the tool measured using Cronbach test; the tool proved to be reliable at (0.85) showed that was good.

Pilot study

Pilot study will be conducted on (10%) of the sample (three patients) to test clarity of the tools, applicability estimate the length of time needed to collect data and modifications will apply if needed.

Implementation phase

- During this phase the researcher conducted the assessment process for the number of cases admitted in the medical department at (El- Kharga general hospital).
- Once the permission was granted to proceed with the proposed study, the researcher initiated data collection, name of potential patients who have admitted to the unit and who met the criteria were obtained from the computerized system.
- Firstly, the researcher greeted the patients, introduced herself and purpose of study was explained to patients who agreed to participate in the study prior to any data collection. The researcher took the patients' telephone number at the first contact (during hospitalization) to

determine the time of appointments in order to complete data collection process (for 6 months)

- After taking the patient's oral agreement for voluntary participation in the study, each patient involved in the study was interviewed individually for filling (Tool I) they were given the standard hospital instructions.
- For the study patients the researcher explained the nursing instructions which were developed by the researcher after passing through an extensive and relevant literature review. Its aim was to enable patients who had sickle cell anemia to be knowledgeable about instructions which help them in minimizing the risk of sickle cell anemia. It was prepared in simple Arabic language with simple photo illustrations. It was covered the following:
  - Brief overview about definition and causes of anemia.
  - Brief overview about Healthy red blood cells versus sickle cells.
  - Information about sickle cell anemia as (definition, risk factors, signs & symptoms, complications, sickling tests and diagnostic studies).
  - Nursing instructions of health promotion life style for sickle cell anemia as (Health responsibility, Physical activity, Nutrition, Interpersonal relation).
- Each patient was met for one session in the morning shift. The session took about 20-30 minutes. One family member was present in the session for patient's support and increasing their sense of responsibility. Patients were allowed to ask questions in case of misunderstanding while listening and expressing interest.
- After completing the session there were about 5-10 minutes for discussion and feedback. Reinforcement was performed according to patient's needs to ensure their understanding.
- At the end of the session the researcher emphasized on the importance of follow up visits and arranged with them the time and place for follow up which were every month for sixth months in the outpatient clinic of (El- Kharga general hospital).
- Each patient obtained a hard copy of the booklet also the researcher used pictures to enhance patient's knowledge and helped them to retain the learned material.
- The collection of data lasted through the period from December 2018 to June 2019.

Evaluation phase

- In this phase study group patients were evaluated for their level of knowledge (pre, after three months and after sixth months from application of nursing instructions). They assessed three times (one month, after three and sixth months) from the application of nursing instructions protocol on health promotion life style for patients with SCA will be done after 3 months and 6 months using (Tool I- part III &Tool II). The session took about 20 minutes.
- For the studied patients they were evaluated three times.

Statistical design: Data entry was done using compatible personal computer by the researcher. All data was entered into statistical packages for the social sciences (SPSS) version 20.0 software for analysis and Excel for figures. The content of each tool was analysed, categorized and then coded by the researcher. Categorical variables were described by number and percent, where continuous variables described by mean and standard deviation (Mean, SD). Chi-square test and fisher exact test used to compare between categorical variables. A two-tailed $p < 0.05$ was considered statistically significant.

Results

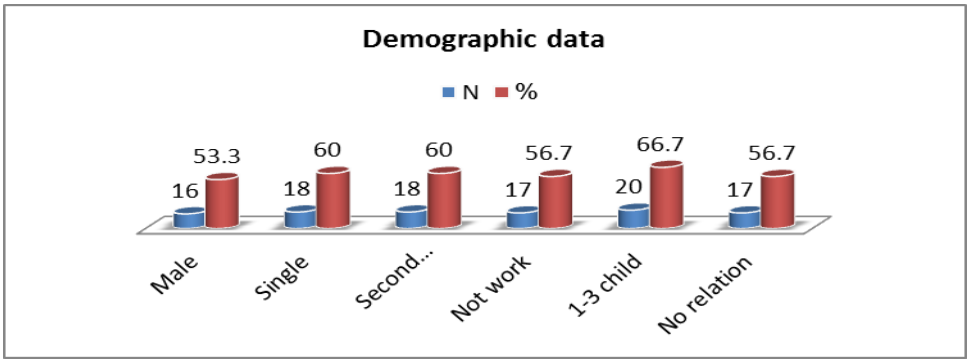

Figure (1): Demographic data.

Table (1): Percentage distribution of studied patients regarding pain assessment.

Items	Pain assessment:						P.V.
	Pretest		After 3 months		After 6 months		
	n	%	n	%	n	%	
no pain	0	0.0%	0	0.0%	2	6.7%	0.001**
1-3 mild pain	2	6.7%	22	73.3%	28	93.3%	
4-6 moderate	20	66.7%	8	26.7%	0	0.0%	
7-9 sever	3	10.0%	0	0.0%	0	0.0%	
10 worst	5	16.7%	0	0.0%	0	0.0%	
Total	30		30		30		
Mean± P. Value Std. Deviation	5.73±2.44855		**2.53±1.04166**		1.86±.50742		
Total	**3.37±2.**29596						

Chi-Square and one way a nova Tests ***= highly significance *p≤0.01*

Table (2): distribution of total Health promotion.

Health promotion		n	Mean± Std. Deviation	Minimum	Maximum	Sig.
Total health responsibility	pretest	30	17.50±4.71	9.00	28.00	0.001**
	after3month	30	20.26±3.23	15.00	29.00	
	after6month	30	21.63±3.06	17.00	29.00	
	Total	90	19.80±4.08	9.00	29.00	
Total physical activity	pretest	30	8.93±1.36	8.00	13.00	0.001**
	after3month	30	12.10±2.38	8.00	16.00	
	after6month	30	13.50±2.47	8.00	20.00	
	Total	90	11.51±2.85	8.00	20.00	
Total nutrition	pretest	30	18.23±3.53	12.00	26.00	0.001**
	after3month	30	21.03±2.91	16.00	26.00	
	after6month	30	22.73±2.98	17.00	28.00	
	Total	90	20.66±3.63	12.00	28.00	
Total inter personal	pretest	30	21.60±4.83	12.00	31.00	0.001**
	after3month	30	23.16±4.03	16.00	31.00	
	after6month	30	24.00±3.73	16.00	31.00	
	Total	90	22.92±4.29	12.00	31.00	

One way a nova - Tests ***= highly significance *p≤0.01*

Table (3): **Relation between mean Pain level score of the studied patients and pre-test, after three and sixth months regarding their sociodemographic characteristics (n=30).**

Variables		Pain level pre test								Sig.
		1-3 mild pain		4-6 moderate		7-9 sever		10 worst		
		N	%	N	%	N	%	N	%	
Age	18-38yrs.	1	3.3	18	60.0	3	10.0	4	13.3	.366ns
	39-59 yrs.	1	3.3	2	6.7	0	0.0	1	3.3	
Sex	Male	2	6.7	10	33.3	2	6.7	2	6.7	.492ns
	Female	0	0.0	10	33.3	1	3.3	3	10.0	
Education level	Second education	1	3.3	11	36.7	2	6.7	4	13.3	.758ns
	University	1	3.3	9	30.0	1	3.3	1	3.3	
Occupation	working	1	3.3	8	26.7	2	6.7	2	6.7	.846ns
	Not work	1	3.3	12	40.0	1	3.3	3	10.0	

Variables		Pain level pre test								Sig.
		1-3 mild pain		4-6 moderate		7-9 sever		10 worst		
		N	%	N	%	N	%	N	%	
Pain level after 3 months										
Age	18-38yrs.	19	63.3	7	23.3					.716ns
	39-59 yrs.	3	10.0	1	3.3					
Sex	Male	9	30.0	7	23.3					.030*
	Female	13	43.3	1	3.3					
Education level	Second education	12	40.0	6	20.0					.282ns
	University	10	33.3	2	6.7					
Occupation	working	7	23.3	6	20.0					.045*
	Not work	15	50.0	2	6.7					
Pain level after 6 months										
Age	18-38yrs.	24	80.0							.747ns
	39-59 yrs.	6	13.3							
Sex	Male	16	46.7							.276ns
	Female	14	46.7							
Education level	Second education	19	60.0							.152ns
	University	11	33.3							
Occupation	working	12	40.0							.687ns
	Not work	18	53.3							

*Chi-Square Tests *= significance *p≤0.05 Ns= Non significant difference P>0.05*

Table (4): Relation between mean health promotion and sociodemographic data.

Variables		Health promotion			Sig P1	Sig. P2	Sig. P3
		Pretest	After 3 months	After 6 months			
		Means ±SD	Means ±SD	Means ±SD			
age	18-38yrs.	66.26± 10.45	76.46± 7.77	81.76± 8.32	.997 ns	.857 ns	.868 ns
	39-59 yrs.	66.25± 12.71	77.25± 10.30	82.50± 5.74			
Sex	Male	66.75±9.98	77.62±6.62	83.87±7.13	.793 ns	.445 ns	1.42 ns
	Female	65.71±11.47	75.35±9.35	79.57±8.45			
Education level	Second education	63.83±11.57	74.66±8.87	80.33± 8.78	.123 ns	.110 ns	.201 ns
	University	69.91± 7.80	79.41± 5.48	84.16± 6.13			
Occupation	working	64.00± 6.29	74.84± 5.19	81.07± 5.45	.311 ns	.308 ns	.642 ns
	Not work	68.00± 12.80	77.88± 9.49	82.47± 9.55			

Independent test Ns= Non significant difference P>0.05

Table (5): Correlation between pain and health promotion.

variable	Pain level	Sig. (2-tailed)
Health promotion	R	Sig.
Pretest	-.497**	0.005**
After 3 month	-.029	.877
After 6 month	-.295	.113
Total health promotion	-.567	0.001**

Spearman's rho Correlation

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

Figure (1): Shows Percentage distribution of studied patients according their sociodemographic data Characteristic.

Table (1): Reported that there was a highly statistical significance difference between pretest, after three months and after sixth months of distribution for studied sample regarding pain assessment.

Table (2): Illustrated total health promotion there was highly statistical significance difference between pre-test, after 3 and 6 months.

Table (3): Shows that there was no statistically significant relation between patient's pain level and variables except to (sex and occupation).

Table (4): shows that there was no statistically significant relation between patient's Health promotion and sociodemographic data.

Table (5): Illustrated negative correlation there was statistical significant between pain and health promotion 0.001**.

Discussion

Sickle-cell disease (SCD) is a group of genetic disorders characterized by abnormally shaped red blood cells (RBCs), which are removed from the circulation and destroyed at increased rates, leading to anemia **Bourzac, (2017).**

Health-Promoting Lifestyle is generally accepted that the way to achieve optimal health and prevent disease is to maintain a healthy lifestyle **Chatterjee et al., (2018).**

Regarding socio-demographic characteristics of the patients, the current study revealed that more than half of the patients in the study their age ranged between eighteen - thirty eight years old. These findings supported by **Taylor et al., (2010)** who reported that the mean age of patients was 27 years.

The results from data collected in this study showed that slightly more than half of patients in the study patients were male. This result was congruent with **Arduini & Trovó de Marqui, (2018)** who reported in their study that more than half of patients were male.

These results are consistent with the current epidemiological data of **Chaturvedi, & DeBaun (2016)** study who observed that SCD was no longer a pediatric disease and that the population of persons over 25 years of age living with SCD is continuing to increase.

In relation to marital status, the present study revealed that the majority of patients were single; this is compatible with previous findings **Levenson et al., (2008),** almost patients study were secondary level of education this result was congruent with **AlDallal et al., (2016),** almost more than half of the sample had secondary school, that describe that more than half were not work.

Piper (2017) found that; the majority of the patients were single, these results are similar to Prior research suggests that the social stigmatization often associated with SCD is in part responsible for the frequently reported fears of disclosing their SCD status and of producing children with SCD.

The present study showed that; more than two thirds of the patient with sickle cell anemia had number of children in the family between 1-3 children more than half of the studied sample had not relation between the father and the mother. Majority of that had relation had a first degree relationship, a While the majority of the studied samples were members of the family suffering from sickle cell anemia. In this respect **Leger et al., (2018)** found that economic implication of SCD is a factor that not only affects the patient, but also family members or relations

Regarding pain assessment, the existing study revealed that; level of pain decreased after application of the nursing instructions protocol, with significance statistically deference between pre application and after 6 months. This compatible with **De Baun, & Vichinsky, (2016)** who found patient' education increase and enhancing their life style to be more healthy and decrease pain.

Furthermore, as suggested by **Chapman, & Vierck, (2017)** as acute pain progresses and becomes chronic, the degree might decrease (although not disappear) and the individuals view their pain as more of a challenge as they persistently attempt to find new ways of adjustment to its presence. This observation may be applicable to patients with severe SCD pain in our study.

Health promotion lifestyle pre and post, the present study showed that; there was a significant difference between pre and post 6 months nursing instructions protocol application. In addition, the study revealed that there was an improvement in the life style domains after 6 months.

Healthy lifestyle such as proper nutrition is an effective way for controlling and avoiding future pain associated with sickle cell disease. In addition to managing pain, a healthy diet also support promotes health and overall well-being **Arluck, & Mayhew, (2018).**

Healthy promotion life style helps the patients to participate in a daily, self-motivated, collaborative (conducted with family, social, and healthcare provider support) process to manage symptoms **Schulman-Green et al., (2012).**

Correlation and relationships: Pain and Sociodemographic, the present study showed that there was no statistical significant deference between pain level and Sociodemographic characteristics

except with sex and occupation of the studied patients.

The result of this study not agreed with **Ahmadi et al., (2015)** who found that both men and women were equal in their reported threat and challenge appraisals. Moreover, they also found that both men's and women's threat appraisals were positively correlated with both the intensity and duration of patients pain.

In this regard, the results lend support to **Meints et al., (2019)** who suggested that the ability to control pain should be viewed as an appraisal construct and not a coping strategy and as an important aspect of the comprehensive management of SCD pain management.

Regarding relation between Sociodemographic data and health promotion: The present study showed that there was no statistical significant deference between Sociodemographic data and health promotion.

The findings in this study are similar to findings by **Alzahrani et al., (2019)** in which gender was not significantly associated with the mean total scores or subscale scores of the health promotion lifestyle profile and subscales of health responsibility, physical activity, nutrition,

Because the majority of patients in this study were male, however, **Knobf et al., (2018)** found in their study, females reported engaging in fewer health promotional behaviors than males on the subscales of health responsibility, physical activity, nutrition, spirituality and stress management, but reported experiencing better interpersonal relations.

In our study the number of male more than female. **Graham et al., (2018)** noted that women, especially African-American women are less likely to engage in health promotion behaviors than other groups of women and low income black women tend to engage in fewer health promotion behaviors.

From researcher opinion that; women act as the primary care providers for their family and because of this; they may have little time to engage in health promoting behaviors such as preparation of healthy nutritious meals or exercise.

Nevertheless, **Sriram et al., (2018)** noted that females reported better Interpersonal relationships, particularly those within the family unit.

In addition, **Kelly et al., (2016)** also suggested that men report lower interpersonal relations because their involvement in community organizations and recreational activities helps them meet their need for interpersonal support.

As perception of good health increases, or their ability to feel capable of performing specific behaviors, individuals were more likely to act in ways to achieve and maintain a healthy lifestyle **Kerner, & Goodyear, (2017).**

The findings in this study are similar to those reported by **Baygi et al., (2017)** who found no significant association between ages and mean total scores on the health-promoting lifestyle profile. However, unlike **Javadzade et al., (2019)** who found that adults and older adults engaged in health-promoting behaviors, age was not significantly correlated with health-promoting behaviors in this study.

Hong et al., (2018) reported that age was a significant variable with gradual increase in nutrition and health responsibility as one aged and decreases in exercise for each decade except for 55 to 64 age group.

Although not significant in this study, the results support the findings by **Hua et al., (2015)** which they reported that older patients reported fewer health promotional behaviors related to exercise. The researcher opinion that; older patients may perceive that they are more limited due to their age or have health related conditions which prevent them from exercising.

As patients age, they may experience more chronic illnesses and as a result may perceive they are incapable of managing their health. Therefore, they may practice fewer health promotional activities related to physical activity. However, as a result of these medical conditions and in order to prolong life, older patients may choose to change their behaviors related to health promotion, such as becoming more responsible for their health, eating healthier foods, or increasing their physical activity **Korkmaz et al., (2017).**

With the exception of the barriers to health promotion, patients who had a graduate educational level had the highest mean on all variables of health promotion, perceived health competence, and sickle cell anemia-related knowledge. This suggests that the better educated people are, the more likely they are to assume responsibility for their health and practice more health- promoting behaviors. The higher the educational level, the greater the knowledge one has regarding health promoting behaviors **Register-Mihalik et al., (2017).**

Regarding Correlation between pain and health promotion: the present study showed that there was a negative significant correlation between them. In this respect **Kaufman et al., (2018)** found that there was a significant relationship were found between participants' levels of pain severity, SCD symptom severity and life style.

Murphy et al., (2016) suggested that SCD pain interfered significantly in the daily lives and interpersonal relationships with family and friends of these participants. These findings are consistent with and provide support for the significant correlations

found between pain severity, and health promotion life style.

Of particular clinical importance our study was the finding that both the increased ability to control SCD pain and decrease SCD pain were significantly correlated higher levels of healthy life style satisfaction for these adult participants.

These findings are provide support to prior research studies that have demonstrated that the perceptions of control over pain is a significant predictor of the variances in response to treatment, health outcomes, and healthy life style **Halvari et al., (2019).**

Finally, Health promotion lifestyle play a great role in portion SCD patients to participate in a daily, self-motivated, collaborative (conducted with family, social, and healthcare provider support) process to manage symptoms. Application of nursing instructions protocol for patients with sickle cell anemia effected on either health promotion life style and decreased pain after six months.

Conclusion

The nursing instruction protocol had statistical significant effect on minimizing pain and improving health promotion lifestyle.

Recommendations

Based on the findings of present study, the following recommendations are suggested:

For patients

- Continuous educational programs to improve patient's knowledge about sickle cell anemia, its prevention and early detection especially among high risk patients.
- Encourage patients to participate in group teaching regarding sickle cell anemia.
- Interventions that promote positive reinforcement of the value and necessity of compliance with therapeutic regimen should be emphasized.
- Strategies to improve and sustain adherence levels are required including counseling offered to patients who are deteriorating or experience periodic exacerbation of symptoms.
- Increase patients' awareness about the importance of periodic follow up to prevent developing any complications which can effect on them.
- Establishment of a web site, including all information pertained to sickle cell anemia.

For nurses

- Periodically assessment of nurses' knowledge in relation to sickle cell anemia and its complications.
- In-service training programs should be conducted on regular basis to improve and up-date nurses' knowledge and practice.
- The discharge planning process needs to be stated clearly for nurses and they should be aware by their professional responsibilities.
- **For administration: -**
- Ward conference should be planned periodically order to introduce to all health team member's new advices in the field for their provision of care.
- A written teaching hand book should be available for each patient in simplified term and containing simple pictures and distributed among sickle cell anemia patients about preventive measures of sickle cell anemia to provide them with the needed information.
- Engagement of patient family in patient education sessions is recommended to improve and sustain adherence levels.

For research: -Replication of the study on a larger probability sample selected from different geographical areas in Egypt is recommended to obtain more generalizable data.

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