

Effectiveness of Educational Resources on the Prevention of Sickle Cell Anemia in Teenage Females

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Abstract

Sickle cell anemia is a genetic or inherited not curable but preventable disorder and a major cause of morbidity and mortality. It is a major public health concern in tribal communities not only in Gujarat but also globally. Gujarat, a western state of India, has a high tribal population. Sickle cell Anemia is a group of inherited disorders. In this disease, a person's red blood cells are affected especially the shape of the cell responsible for carrying oxygen to all body parts. There are variations in red blood cell shape like crescent moon or sickles. This is rigid and sticky which obstructs or slows the blood flow. Sickle cell trait or Sickle cell carrier is not a disease but the person has inherited the gene from one of his or her parents and does not have symptoms of sickle cell disease. When a person with sickle cell trait marries a person who has the gene or is a carrier of sickle cell anemia, the risk of sickle cell disease will increase in their children. Adolescence is the transition from the world of childhood to the world of adulthood. It is the period of physical and emotional development that occurs. They have the right to know about disease, especially Preventive Measures of sickle cell anemia. They can also improve their quality of life by taking preventive measures.

Aim of the study: This study aimed to assess the effectiveness of educational resources in preventing sickle cell anemia among teenage females.

Material and Methods: A quantitative research approach in that pre-experimental research design was used to assess the effectiveness of educational resources on the prevention of sickle cell anemia among teenage females. The study was conducted in selected schools of Bharuch. A purposive Non-probability sampling technique was used to select 60 teenage females at selected schools in Bharuch. The data-collection tool consisted of a personal profile and structured interview schedule to assess knowledge regarding preventive measures for sickle cell anemia. Data was analyzed using descriptive and inferential statistics.

Result: The present study has revealed that the majority of (mean 13.08) variables had average knowledge and (mean 8.69) variables had poor knowledge regarding prevention of sickle cell anemia among teenage females whereas in post-test (mean 16.55) had average knowledge and (mean 22.54) we're had good knowledge and finding of calculated t value of knowledge score was 33.227 which was highly significant which indicates the planned teaching program was effective in improving the knowledge regarding preventive measures of sickle cell anemia.

Keywords: Prevention of sickle cell anemia, Effectiveness, Teenage females.

Introduction

Anemia happens when the body doesn't have enough red blood cells or red blood cells don't work as they should. Red blood cells carry oxygen throughout the body. Oxygen powers your cells and gives you energy. Without healthy red blood cells they do not do their job, the body doesn't get the energy it needs to function. While some types of anemia are short-term and mild, others can last for a lifetime. Left untreated, anemia may be life-threatening. There are 4 classifications of anemia based on the amount of hemoglobin, nutritional anemia, anemia caused by abnormal red blood cells, and inherited

anemia.

Anemia caused by abnormal red blood cells in that there are 6 categories which are Haemolytic anemia, Aplastic anemia, Macrocytic anemia, Microcytic anemia, Normocytic anemia, and Sideroblastic anemia.

Inherited anemia divides into two categories which are Diamond-Blackfan anemia and sickle cell anemia. The first description of sickle cell disease was given on 15 November 1910 by James Herrick. He had a young patient with this disease. Sickle cell anemia is a group of inherited disorders. In this disease, a person's red blood cells are affected especially the

shape of the cell which is responsible to carry oxygen to all parts of the body. There are variations in red blood cell shapes like crescent, moon, or sickles. This is rigid and sticky which obstructs or slows the blood flow.

In this disease inheritance of the sickle hemoglobin (HbS) gene, occur which results in the hemoglobin molecule being defective. People who have the two copies of sickle cell gene – one from each parent it make abnormal hemoglobin. The life span of RBC in sickle cell anemia is 10-20 days.

Normal RBCs have smooth surfaces, enabling them to change their shape and flow through small blood vessels. The age at which sickle cell disease is diagnosed ranges from 3 months to 12 years.

Sickle cell genes affect the production of an important chemical called hemoglobin.

Haemoglobin is located in red blood cells, which are part of the blood. Haemoglobin carries oxygen and gives blood its red color. The sickle cell genes make the body produce abnormal hemoglobin called HbS. (Normal hemoglobin is called HbA.) HbS behaves differently from HbA. Under certain conditions, HbS makes the red blood cells change shape – instead of the normal doughnut shape, they become sickle-shaped, like a crescent moon. This is called sickling. Conditions that trigger sickling are cold, infection, lack of fluid in the body (dehydration), low oxygen, and acid (acid is produced in hard physical exercise)

Nearly 90% of the world's SCD population live in three countries: Nigeria, India, and the Democratic Republic of Congo where this disease affects up to 2% of the population and the carrier prevalence rate is as high as 10 to 30 %. It has been estimated that between 2010 and 2050 about 14.2 million babies will be born with sickle cell anemia.

India is estimated to have the second-highest burden of SCD after Nigeria. It is estimated that there may be 18 million SCD and 1.4 million SCD patients among the tribal population.

Need Of The Study

- In the tribal population adolescent girls and women are treated badly which will affect their health. They are having high risk due to inadequate knowledge; girls get married even before the growth period is over which will ultimately increase

their risk of sickle cell anemia. In these areas, girl's and women's health is ignored. They have right to get knowledge about disease specially regarding Preventive Measures for sickle cell anemia.

- The government is committed to eliminating the disease before India celebrates its Amrit Kaal in 2047. This was stated by the Hon'ble Prime Minister of India, Shri Narendra Modi as he launched the National Sickle Cell Anaemia Elimination Mission (NSCEM).

- "The program is executed in a mission mode as part of the National Health Mission (NHM), aims to eliminate sickle cell genetic transmission by the year 2047, showing a long-term commitment to eradicating the disease.

- Globally The number of people living with sickle cell disease increased by 41.4% (38.3–44.9), from 5.46 million (4.62–6.45) in 2000 to 7.74 million (6.51–9.2) in 2021.

- The prevalence of sickle cell carriers among different tribal groups varies from 1 to 40 percent Madhya Pradesh has the highest load with an estimated number of 9, 61,492 sickle heterozygotes and 67,861 sickle homozygotes

- Gujarat with 89.12 lakh tribal populations is expected to have at least 9,00,000 SCT and 70,000 SCD patients 15% of the total population of Gujarat in different states like Banaskantha, Vadodara, Rajpipla, Bharuch, Valsad, Surat, Dang, etc.

- In Gujarat 1,40,26,563 tribal population are there, 96,81,695 were screened, of which 7,22,645 had sickle cell trait 7.46 % and 29,555 were sickle cell disease

- Total screening up to 2022 in Bharuch for sickle cell anemia. A total of 325768 tribal population are there, 70554 population covered in screening in 83.05%. Of which 1276 were SCD and 15795 were SCT.

Objectives Of The Study

- To assess the pre-test knowledge score regarding the prevention of sickle cell anemia among teenage girls of selected schools of the Bharuch.

- To evaluate the effectiveness of educational resources of post-test on the

knowledge regarding prevention of sickle cell anemia among teenage females of selected schools of Bharuch.

- To find out the association between pre-test knowledge score with selected socio-demographic variables.

Assumption

1. Teenage females may have some knowledge regarding the prevention of sickle cell anemia.
2. Educational resources will update their lacking knowledge on prevention for sickle cell anemia.

Significance of the study: This study aimed to assess the effectiveness of educational resources in preventing sickle cell anemia among teenage females.

Research Methodology

Research approach: A Quantitative approach is used to evaluate the effectiveness of educational resources on the prevention of sickle cell anemia in teenage females.

Research Design: **Pre –experimental one-group pre–test – post–test** research design is adopted for this study.

VARIABLES:

In this study INDEPENDENT VARIABLE: Educational Resources on the Prevention of Sickle Cell Anemia in Teenage Females & the dependent variables were teenage females. The attribute variables included the demographic variables comprising age, gender, religion, geographical area, residence area, education of parents, occupation of parents, socio-economic status, eating habits, eating pattern, and sickle cell history.

Research Setting: The setting for the study was selected schools of Bharuch.

Population and Sample

Target population: In this study target population consists of teenage females from selected schools of Bharuch.

Sample Population: The Sample population for the

study is 60 teenage females

Sampling Technique: Non-probability purposive sampling technique

TOOLS FOR DATA COLLECTION:

A structured knowledge questionnaire and a planned teaching program as a learning aid regarding preventive measures for sickle cell anemia were selected as tools. The Planned Knowledgequestionnaire focused on introduction, definition, risk factor, signs and symptoms, prevention, and protocol for the management of establishment of sickle cell anemia. The planned teaching program included an introduction, definition, risk factors, signs and symptoms, prevention, and protocol for the management of sickle cell anemia. Lecture cum discussion and demonstration were adopted as the method of teaching along with appropriate A.V. Aids. The reliability of the structured knowledge questionnaire was determined by the 'Test-retest method' using the Karl Pearson formula and was found to be 33.227.

Data Collection:

After getting formal permission from the concerned authorities the purpose, objectives, and method of implementation of the tool were discussed with the samples and informed consent was taken. The investigator administered a pre-test on 1st day and then administered the Planned Teaching Programme on the same day. The post-test was taken after 7 days.

DATAANALYSIS & RESULTS:

The data in section I was analyzed using frequency and percentage. The data in section II will be analyzed with the help of descriptive (mean and standard deviation) and inferential statistics ('t' test and chi-square test). Section III assessment of knowledge score before & after administration of planned teaching program. Section IV Association of pre-test knowledge score with selected demographic variables.

SECTION: I

Analysis and interpretation of demographic data of respondents.

Table:1 Shows the distribution of the demographic variable of teenage females of selected schools of Bharuch

Sr no.	Demographic variables	Frequency (f)	Percentage
1.	Age:		
	14-15 years	0	0%
	16-17 years	60	100%
2.	Gender:Female		
	Others	60	100%
		0	0%
3.	Religion:Hindu Muslim Christian		
	Others	52	86.7%
		5	8.3%
		3	5.0%
4.	Geographical Area: Costal belt Northern belt		
	Tribal belt Southern belt	0	0%
		0	0%
		4	6.7%
5.	Area of residence:Rural		
	UrbanSlum	12	20.0%
		43	71.7%
		5	8.3%
6.	Education of father:		
	No formal education	14	23.3%
	Higher primary and secondaryeducation	41	68.3%
7.	Education of mother:		
	No formal education	24	40.0%
	Higher primary and secondaryeducation	32	53.3%
8.	Graduation	4	6.7%
	Occupation of father: Government job		
	Private job Agriculture	0	0%
	Self employeeOthers	8	13.3%
		4	6.7%
	2	3.3%	
	46	76.7%	

9.	Occupation of mother: Housewife Government job Private job Self employeeOthers	58 0 2 0 0	96.7% 0% 3.3% 0% 0%
10.	Socioeconomic status:Lower class status Lower middle-class status Middle-class status Upper middle-class status Upper-class status	0 4 54 2 0	0% 6.7% 90.0% 3.3% 0%
11.	Eating pattern:Vegetarian Non-vegetarianMixed	52 0 8	86.7% 0% 13.3%
12.	Eating habits:Regular Irregular	58 2	96.7% 3.3%
13.	Previous knowledge:Yes No	5 55	8.3% 91.7%
14.	Source of knowledge:Peer group Printed media Family members / RelativesOthers	0 3 2 0	0% 60.0% 40.0% 0%
15.	Sickle cell history:Yes No	2 58	3.3% 96.7%

Table: 2 Analysis and interpretation of the pre-test and post-test scores in terms of knowledge regarding preventive measures of sickle cell anemia.

Category	Pre-test			Post-test		
	N	Mean	SD	N	Mean	SD
Poor	23	8.69	1.25	0	0	0
Average	37	13.08	2.08	49	16.55	2.51
Good	0	0	0	11	22.54	1.21

Table :3 Mean score, mean difference, and standard deviation in pre-test and post-test.

[n = 60]

Subject	Pre-test		Post-test		Mean Difference
	Mean	SD	Mean	SD	
ScoreValue	11.44	2.8	17.65	3.29	6.25

Table:4 Correlation , t-score, and p value between pre-test and post-test knowledge score

VARIABLE	N	Mean	SD	r	t score	P value
Pre-test score	60	11.40	2.81	0.898	33.227	<0.001
Post-test score	60	17.65	3.30			

Table Frequency, pre-test score, Chi-square, DF, P value, t value, and level of significance of the demographic variable.

Demographic variable		Pre-test score		Total	Chi-Square	DF	P Value	table value	S /NS
		Average	Poor						
Age in years	16-17 years	37	23	60	This data Cant be computed				
Gender	Female	37	23	60	This data Cant be computed				
Religion	Hindu	32	20	52	0.038	2	0.981	5.99	NS
	Muslims	3	2	5					
	Christians	2	1	3					
Geographicalarea	Tribal belt	0	3	3	5.08	1	0.0242	3.84	S
	Southernbelt	37	20	57					
Area of residence.	Rural	8	4	12	0.159	2	0.924	5.99	NS
	Urban	26	17	43					

	Slum	3	2	5					
Education of the father	No formal education	3	7	10	7.116	2	0.0285	5.99	S
	Higher Primary and secondary education	26	15	41					
	Graduate	8	1	9					
Education of the mother	No formal education	15	9	24	0.247	2	0.884	5.99	NS
	Higher Primary And Secondary Education	20	12	32					
	Graduate	2	2	4					
Occupation of the father	Private job	6	2	8	0.959	3	0.811	7.82	NS
	Agriculture	2	2	4					
	Self employee	1	1	2					
	Others	28	18	46					
Occupation of the mother	Housewife	35	23	58	1.286	1	0.257	3.84	NS
	Private job	2	0	2					
Socioeconomic Status	Lower Middle-class Status	2	2	4	1.481	2	0.477	5.99	NS
	Middle-class Status	33	21	54					

	Upper Middle-class Status	2	0	2					
Eating Pattern	Vegetarian	32	20	52	0.003	1	0.958	3.84	NS
	Mixed	5	3	8					
Eating habits	Regular	36	22	58	0.119	1	0.73	3.84	NS
	Irregular	1	1	2					
Previous knowledge regarding sickle cell anemia	Yes	1	4	5	4.006	1	0.0453	3.84	S
	No	36	19	55					
If yes Source of knowledge regarding sickle cell anemia	Printed Media	2	1	3	5.000	1	0.023	3.84	S
	Family members / Relatives	3	0	3					
In Family members anyone having sickle cell history	Yes	0	2	2	3.328	1	0.068	3.84	NS
	No	37	21	58					

Major Finding Of The Study

The data were analyzed and interpreted in terms of the objectives of the study. The findings were presented under the following headings :

- Findings related to the demographic data of the variable.
- Findings regarding mean score and standard deviation between pre and post-level of overall knowledge regarding preventive measures of sickle cell anemia.
- Findings regarding the association of knowledge with selected demographic variables.

All 60 samples were females between the age of 16-17 years. In religion, there were more Hindus 52 (86.7%), Muslims were 5 (8.3%), Christians were 3 (5%). In the geographical area majority of girls, were belonged to southern belt 56 (93.3%) another were belong to tribal belt 4 (6.7%). Area of residence of the sample, in urban areas 43 (71.7%) were there, in rural areas 12 (20%) and in slum areas 5 (8.3%) girls were there. In the education of fathers, the majority of fathers took education in higher primary and secondary education 41 (68.3 %), 14 (23.3%) did not take any formal education and 5 (8.3%) graduated. Moreover, in the education of mothers, 32 (53.3 %) took education in higher primary and secondary education, 24(40%) did not take formal education, and 4 (6.7%) mothers graduated. In the occupation of fathers, 8 (13.3%) fathers were doing a private job, 4 (6.7%) were involved in agriculture, 2 (3.3%) were self-employed, and 46 (76.7%) were involved in other occupations.

Moving towards the occupation of mother majority of mothers were housewives 58 (96.7%) and 2(3.3%) were doing private jobs. Many girls were from middle-class status 54 (90%), 4 (6.7%) were from lower middle-class status and 2 (3.3%) were from upper-middle-class status. In the eating pattern, 52 (86.7%) girls were vegetarian and another 8 (13.3%) were mixed. The majority of girls were had regular eating habit 58 (96.7%) and 2 (3.3%) were had irregular eating habit. Only 5 (8.3%) girls had previous knowledge regarding preventive measures of sickle cell anemia another 55 (91.7%) did not had any knowledge regarding preventive measures of sickle cell anemia. By printed media, 3 (60 %) girls were had previous knowledge, and 2 (40%) had previous knowledge by family members or relatives. In family history only 2 (3.3%) had a family history of sickle cell anemia another 58 (96.7%) did not have any history of sickle cell anemia

2. Findings regarding mean score and standard deviation between pre and post-level of overall knowledge regarding preventive measures of sickle cell anemia.

According to the findings, the overall knowledge mean score in the pre-test was 11.4 and the standard deviation was 2.8, whereas in the post-test mean score was 17.65 and the standard deviation was 3.29.

3. Findings regarding the association of knowledge with selected demographic variables.

In the association between knowledge and selected demographic variables, the findings revealed that there was a significant association between knowledge and Geographical area, Education of the father, previous knowledge regarding preventive measures of sickle cell anemia, and source of knowledge regarding preventive measures of sickle cell anemia.

Conclusion

The following conclusion can be drawn from the present study findings; in the present study knowledge of the samples in the Pre-test was poor. Investigators prepared the planned teaching program on preventive measures of sickle cell anemia keeping in mind the blueprint, review of literature, and expert opinion. The main factors considered for preparation of the planned teaching program were convenience, self-pacing, and independent study. Appropriate and colorful illustrations were incorporated to enhance understanding. It was envisaged that self-pacing would give learning opportunities to both slow and fast learners. The final draft of the planned teaching program was prepared after suggestions given by experts . The material was developed in the English Language.

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