Evaluating the Effectiveness of a Comprehensive Nursing Approach on Knowledge Enhancement Among Adults Diagnosed with Sickle Cell Disease in Tribal Communities

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Abstract:

Introduction: Sickle Cell Disease (SCD) is a hereditary group of blood disorders, with the most common form being sickle cell anemia. This condition is caused by an abnormality in hemoglobin, the oxygen-carrying protein in red blood cells, which leads to the cells assuming a rigid, sickle-like shape under specific conditions. Symptoms of SCD often begin to manifest in early childhood, typically around 5 to 6 months of age. This study aims to assess the level of knowledge about SCD among adults diagnosed with the disease and to evaluate the effectiveness of a comprehensive nursing approach in enhancing their understanding. **Method:** A quantitative study was conducted among 38 adults diagnosed with SCD from tribal communities in Vadodara, Gujarat. A quantitative research approach was employed, and data were analyzed using descriptive and inferential statistics to evaluate changes in knowledge following the administration of the nursing intervention. **Results:** The pre-test results showed

that 30 participants (78.95%) had poor knowledge of SCD, 8 participants (21.05%) had average knowledge, and none (0%) had good knowledge. After the intervention, post-test results revealed that no participants (0%) had poor knowledge, 35 participants (92%) had average knowledge, and 3 participants (8%) demonstrated good knowledge. **Conclusion:** The comprehensive nursing approach significantly improved knowledge about SCD among adults from tribal communities. Post-intervention, participants showed marked improvements in their understanding of the disease compared to their pre-test levels.

Key word: Comprehensive Nursing approach, Sickle Cell Disease, Tribal Communities.

Introduction:

Sickle Cell Disease (SCD) is a hereditary blood disorder, with sickle cell anemia being the most common form. It is characterized by an abnormality in hemoglobin, the oxygen-carrying protein in red blood cells, causing the cells to become rigid and adopt a sickle-like shape. This abnormality leads to various complications such as pain crises, anemia, swelling, infections, and stroke. Symptoms of SCD generally manifest around 5 to 6 months of age and persist throughout life, often leading to long-term health issues. While medical advancements have significantly improved outcomes for SCD patients in developed countries, access to care remains limited in rural and tribal regions of India, particularly where the disease prevalence is high[1].

SCD disproportionately affects tribal communities in India, especially in regions such as Madhya Pradesh, Gujarat, and Odisha, where a high prevalence of the sickle cell gene has been documented. Despite extensive research into the biomedical aspects of SCD, there is limited investigation into the social determinants and health systems that impact disease management within these tribal populations[2]. Tribal communities in Gujarat, including Bhils, Dhodias, and Naikas, have a significant burden of SCD, yet they often lack access to adequate healthcare services, making education and early detection crucial[3].

Need for the Study: SCD remains a major public health concern in both Gujarat and globally, particularly among tribal populations. Gujarat alone has over 8.9 million tribal residents, with an estimated 900,000 individuals carrying the sickle cell trait and around 70,000 suffering from SCD[4]. A deeper understanding of the community's knowledge and perception of the disease is vital for developing targeted intervention strategies. Increasing awareness about SCD can lead to earlier diagnosis, timely treatment, and the adoption of preventive measures, ultimately

improving disease outcomes. Given the high prevalence of SCD in tribal communities and the lack of sufficient healthcare infrastructure, this study aims to assess the knowledge of SCD among adults and evaluate the impact of a comprehensive nursing approach on enhancing disease awareness.

Methodology:

A quantitative research approach was employed for this study, utilizing a pre-test post-test quasi-experimental design to assess the impact of a comprehensive nursing intervention on the knowledge of adults diagnosed with sickle cell disease (SCD) from tribal communities in Vadodara, Gujarat. The study focused on a purposive sample of 38 adults diagnosed with SCD who met the inclusion criteria, which included being part of the tribal community and having a confirmed diagnosis of SCD. Individuals who were not diagnosed with SCD were excluded from the study.

Research Setting and Population

The study was conducted at Parul Sevashram Hospital in Waghodia, Vadodara. The target population comprised adults diagnosed with SCD from tribal communities. Given the nature of the population, a purposive sampling technique was employed, where participants were selected intentionally based on their characteristics and availability. This technique was chosen to ensure the inclusion of participants who were knowledgeable and experienced in dealing with SCD, making them suitable for the study.

Tool Development and Validation

The data collection tool consisted of a self-structured questionnaire designed to assess the participants' knowledge of SCD. The tool was developed based on a review of the literature, expert opinions, and feedback from students and faculty. The questionnaire was divided into two sections: Section A captured socio-demographic data, while Section B assessed knowledge about SCD through 20 multiple-choice questions. The tool was initially drafted in English and later validated by five experts in various nursing specialties, including Medical-Surgical Nursing and Community Health Nursing, who provided feedback on clarity, appropriateness, and language simplicity. Suggestions from the experts were incorporated into the final version of the tool.

Reliability and Ethical Considerations

After validation, the tool was tested for reliability to ensure consistency in measuring the participants' knowledge. The study was approved by the ethical committee of Parul Institute of Nursing, and permission was obtained from the Nursing Superintendent of Parul Sevashram Hospital. Informed consent was secured from all participants after explaining the purpose of the study and their role in it, ensuring adherence to ethical guidelines.

Data Collection Process

The data collection process involved administering a structured questionnaire to participants who met the inclusion criteria. Participants were approached in the hospital, and the purpose of the study was explained to them prior to obtaining informed consent. The questionnaire was administered in person, with each correct answer receiving a score of 1 and incorrect answers receiving a score of 0. The pre-test was conducted to assess baseline knowledge, followed by the administration of the comprehensive nursing approach, and a post-test was conducted to measure the intervention's impact.

Data Analysis

The collected data were analyzed using descriptive and inferential statistics, as guided by experts in the field of statistical nursing. The pre-test and post-test scores were compared to evaluate the effectiveness of the intervention. The results were tabulated, and statistical tests were used to determine the significance of the findings.

Result:

Table 1: Frequency and Percentage distribution of the Sociodemographic Variables

SR. No.	Demographic Variable	Categories	Frequency	Percentage (%)
1	**Age**	18-28	11	28.94
		29-38	12	31.57
		39-48	7	18.42
		49-58	6	15.78
		Old age	2	5.26
2	**Gender**	Male	14	36.84
		Female	24	63.15
		Transgender	0	0

3	Educational Status	No formal education	6	15.78
		Primary	15	39.47
		Secondary	10	26.31
		Higher Secondary	6	15.78
		Graduated and above	0	0
4	Occupation	Homemaker	19	50.00
		Daily wages	8	21.05
		Business	0	0
		Government	0	0
		Private	10	26.31
5	Religion	Hindu	36	94.73
		Muslim	2	5.26
		Christian	0	0
		Other	0	0
6	Monthly Income (₹)	< 3000	12	31.57
		3000-6000	15	39.47
		6001-9000	3	7.89
		> 9000	8	21.05
7	Lifestyle Factors	Smoking	7	18.42
		Tobacco	12	31.57
		Alcohol	1	2.63
		No bad habit	18	47.36
8	Marital Status	Married	28	73.68
		Unmarried	6	15.78
		Widow	4	10.52
		Divorced	0	0

9	**Working Area**	Sedentary	15	39.47
		Moderate	22	57.89
		Heavy	1	2.63
10	**Dietary Pattern**	Vegetarian	19	50.00
		Non-vegetarian	4	10.52
		Mixed	15	39.47

Table 1 shows demographic characteristics of the 38 participants diagnosed with sickle cell disease (SCD) from tribal communities in Vadodara, Gujarat, present a diverse profile. In terms of **age**, the largest group (31.57%) falls between 29-38 years, followed by 28.94% in the 18-28 age group. A smaller proportion of participants (5.26%) belong to the old-age category. Regarding **gender**, the majority (63.15%) of participants are female, while 36.84% are male, with no transgender individuals participating. The **educational status** of the group indicates that most participants (39.47%) have a primary education, followed by 26.31% with secondary education. Notably, none of the participants had pursued higher education beyond secondary schooling.

In terms of **occupation**, half of the participants (50%) are homemakers, while 26.31% are employed in the private sector. A notable portion (21.05%) are daily wage earners, and no participants were involved in business or government sectors. When it comes to **religion**, nearly all participants (94.73%) identify as Hindu, with a small minority (5.26%) identifying as Muslim. The **monthly income** data reveals that the majority (39.47%) earn between ₹3000-6000, while 31.57% have an income of less than ₹3000 per month.

In terms of **lifestyle factors**, 47.36% of the participants reported having no bad habits, while 31.57% use tobacco, and 18.42% smoke. Only a small fraction (2.63%) consume alcohol. Regarding **marital status**, most participants (73.68%) are married, with 15.78% unmarried and 10.52% widowed. **Working area** data indicates that the majority (57.89%) are engaged in moderate physical activity, while 39.47% have sedentary occupations, and only 2.63% are involved in heavy physical labor. Finally, **dietary patterns** show that half of the participants (50%) follow a vegetarian diet, while 39.47% have a mixed diet, and only 10.52% are non-vegetarian.

Table 2: Frequency and Percentage distribution of the Knowledge about SCD among Tribal communities

Level of Knowledge	Pre-Test		Post Test	
	Frequency	Percentage	Frequency	Percentage
Poor Knowledge	30	78.94	00	0
Average Knowledge	08	21.05	35	92.10
Good Knowledge	00	0	03	7.89

Table 2 illustrates the frequency and percentage distribution of knowledge about sickle cell disease (SCD) among tribal communities, comparing the pre-test and post-test results. In the **pre-test**, the majority of participants (78.94%) exhibited **poor knowledge** about SCD, with 21.05% demonstrating **average knowledge**, and no participants (0%) showing **good knowledge**. However, after the implementation of the intervention, the **post-test** results show a significant improvement. None of the participants (0%) remained in the **poor knowledge** category, while the majority (92.10%) moved to the **average knowledge** level. Additionally, 7.89% of participants achieved **good knowledge** in the post-test. This significant shift in knowledge from poor to average and good levels highlights the effectiveness of the educational intervention on the tribal community's understanding of SCD.

The association between the knowledge of the participants and their demographic variable used chi chi-squared test that was shown in Table no 3 (p) value, $p < 0.05$ was deemed statistically significant. That shows significance in gender, occupation, and marital status and shows mom significance in age, educational status, religion, monthly income, lifestyle factor, working area, and dietary pattern, so, there was a partially significant association between participants' knowledge score and their demographic data.

Discussion and Conclusion:

A similar study was conducted by Dihya Ebrahim Jaffer, V et al. The study was developing an appropriate care plan for sickle cell disease. The purpose of this paper is to explore the extent of knowledge and attitude of Bahraini adult sickle cell patients towards the preventive measures of sickle cell crisis. The objective is to establish baseline data and to utilize the findings in designing awareness programs that would assist the sickle cell patients to prevent the sickling crisis. A convenient sample of 84 Bahraini adult sickle cell patients achieved. Structured

interview approach was used to assess the subjects'knowledge and attitudes toward the preventives measures of sickle cell crisis. The results indicated that the sample was moderately knowledgeable about the sickling preventive measures (Mean of Knowledge score = 55%) and moderately compliant (Mean of Attitudes score = 63%). The subjects'knowledge (about the preventive measures) was found to be moderately and positively correlated (r = 0.57, r2 = 0.32, p = 0.000) with their attitudes toward crisis prevention. Designing awareness programs regarding the preventive measures of sickle cell crisis is an evident need for these patients.[5]

This study aimed to investigate the relationship between study habits and academic achievement among day scholar and Hostelites nursing students at Parul Institute of Nursing, Parul University, Vadodara. The research utilized a quantitative approach and a pre-experimental descriptive research design. The objectives focused on exploring and comparing study habits and academic achievements between the two groups, as well as identifying associations with demographic variables. The findings revealed interesting insights into the demographics, study habits, and academic performance of the participants. While gender distribution and age patterns were consistent with other healthcare education studies, variations in study habit categorizations highlighted the need for standardized assessment approaches. Notably, the comparison between Hostelites and day scholars suggested significant differences in study habits and academic achievement scores. However, demographic variables showed no substantial associations with study habits or academic performance in either group. These findings collectively underscore the multifaceted nature of factors impacting academic success among healthcare students and emphasize the importance of tailored interventions to enhance study habits and educational outcomes in this context.

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