

KNOWLEDGE OF TRIBAL FARM WOMEN REGARDING SICKLE CELL ANEMIA

Arti N. Soni¹, A. J. Dhodia² and C. D. Pandya³

1 Scientist (Home Science), KVK, NAU, Tapi - 394650

2 Scientist (Agricultural Extension), KVK, NAU, Tapi- 394650

3 Senior Scientist & Head, KVK, NAU, Tapi- 394650

Email: sonyarti@gmail.com

ABSTRACT

Sickle cell anemia is one of the most common inherited disease worldwide, which may affect various organ of the human body. Sickle cell anemia is widely spread among tribal communities in India. Tapi is tribal dominated district. A high prevalence of the sickle gene has been demonstrated in various tribal communities of Tapi district. The patient suffering from sickle cell anemia develops blood related complication and can be suspected due to genetic history or by conducting medical examination. Therefore, to combat against this hereditary disease we need to focus on tribal communities. Knowledge plays an important role for achieving desired outcome. Knowledge of any individual increases his/ her awakening. Based on this background, the present study was carried out to assess the knowledge of tribal farm women regarding sickle cell anemia in Tapi district. The data were collected purposively from 300 tribal farm women of Tapi district who have positive sickle cell status. The data were collected with the help of structured interview schedule and analyzed with appropriate statistical tools. It is observed that majority of tribal farm women had young aged, sickle cell trait status, married, in joint family, above five members in family and nearly half of tribal farm women had education upto secondary level. More than half of tribal farm women had no any type of social participation but they were taking medical consultancy and majority of tribal farm women gained information about sickle cell anemia from ASHA workers/ Health workers and health camps. The data clearly revealed that education and medical consultancy were the most important determinants influencing knowledge regarding sickle cell anemia. Majority of tribal farm women had very low to low level of knowledge regarding sickle cell anemia. Therefore, there is need to increase sickle cell screening, health camps, awareness programmes and training programmes in tribal areas for prevention of sickle cell anemia disease.

Keywords: sickle cell trait, sickle cell disease, knowledge, medical consultancy

INTRODUCTION

Sickle cell anemia is an inherited blood disorder characterized by abnormal haemoglobin. According to WHO (African region), about 5% of world's population carries the gene responsible for blood disorders and about 300000 children are born worldwide with sickle cell disease every year. Sickle cell anemia is widely spread among tribal communities in India. In India the Sickle cell anemia was first detected in Veddoid tribe in Nilgiri hills of Tamilnadu, in 1952 by Lehman and Cutbush. It was later discovered in other areas of states. The tribal population contributes 15% of the total population of Gujarat and distributed in various areas of the state. The sickle cell anemia is commonly found in tribal community of south region of Gujarat. Tapi is tribal dominated district. A high prevalence of the sickle gene has been demonstrated in various tribal communities of Tapi including Gamit, Chaudhari, Konkani, Dhodia, Vasava, etc. The patient

suffering from sickle cell anemia develops blood related complication and can be suspected due to genetic history or by conducting medical examination. Sickle cell disease occurs when a person inherits two defective Hb gene of each parent. An individual with a single abnormal gene usually has no symptoms and is called to have a Sickle-cell trait. These people are called carriers, too. There may be a number of health problems such as pain crisis, anemia, risk of infections, Jaundice, breathing problems and stroke. Sickle cell disease sufferers have also shortened duration of life and poor quality of living condition. Tribal women's health is varying because of such factors like local genetic disease prevalence, health & nutrition related behavior, women education etc. Tribal people are the most conservative, orthodox and superstitious which effect their growth and development in all walks of life particularly for women (Raijihari, 2008). Tribal diets are different from entire population as they include certain common foods and different manner (Mittal,2006). Therefore,

to combat against this hereditary disease we need to focus on this tribal population. Major steps for prevention are to carry out various extension programmes, surveys and increasing awareness among the tribal people. Knowledge plays an important role for achieving desired outcome. Knowledge of any individual increases his/ her awakening. Based on this background, the present study was carried out to assess the knowledge of tribal farm women regarding sickle cell anemia in Tapi district.

OBJECTIVES

- (1) To study the profile of respondents
- (2) To study the knowledge of tribal farm women regarding sickle cell anemia
- (3) To ascertain the relationship between the profile of tribal farm women and their knowledge regarding sickle cell anemia

METHODOLOGY

The study was conducted purposively in three blocks namely Dolvan, Vyara and Songadh block of Tapi district due to high prevalence of sickle cell anemia compared to other blocks. The information of tribal farm women with positive sickle cell status was collected from ASHA workers and Health centers. The data were collected from randomly selected 100 tribal farm women of each block who have

positive sickle cell status (sickle cell trait or sickle cell disease) in age group of 18 years and above during the year 2023-2024. Thus, the total sample size for the study was 300. The data were collected with the help of structured interview schedule and set of 13 questions of knowledge regarding sickle cell anemia were used. One score was given for each correct answer and zero was given for wrong answer or if no answer was given by tribal farm women. Dependent variable for the study was the knowledge of tribal farm women regarding sickle cell anemia whereas age, education, marital status, family type, family size, status of sickle cell anemia, land holding, occupation, annual income of family, social participation, source of information, medical consultancy were independent variables. The data were analyzed with appropriate statistical tools such as frequency, percentage, rank, correlation co-efficient, multiple regression, path co-efficient and the level of knowledge was categorized into five categories using arbitrary method of classification viz, very low (0 to 2 score), low (3 to 5 score), medium (6 to 7 score), high (8 to 10 score) and very high (above 10 score). An *Ex-post-facto* research design was used for this study.

RESULTS AND DISCUSSION

Profile of Respondents:

The findings on the profile of respondents are presented in Table No.1

Table 1: Distribution of respondents according to their profile

(n=300)

Sr. No.	Profile of Respondents	Dolvan block (n=100)	Vyara block (n=100)	Songadh block (n=100)	Total (n=300)
1	Age				
1.1	Young age (18 to 35 yrs)	58 (58.00)	67 (67.00)	47 (47.00)	172 (57.33)
1.2	Middle age (36 to 50 yrs)	34 (34.00)	24 (24.00)	32 (32.00)	90 (30.00)
1.2	Old age (above 50 yrs)	08 (08.00)	09 (09.00)	21 (21.00)	38 (12.67)
2	Level of Education				
2.1	Illiterate	36 (36.00)	06 (06.00)	27 (27.00)	69 (23.00)
2.2	Primary	25 (25.00)	23 (23.00)	23 (23.00)	71 (23.67)
2.3	Secondary	19 (19.00)	33 (33.00)	30 (30.00)	82 (27.33)
2.4	Higher Secondary	12 (12.00)	21 (21.00)	14 (14.00)	47 (15.67)

Sr. No.	Profile of Respondents	Dolvan block (n=100)	Vyara block (n=100)	Songadh block (n=100)	Total (n=300)
2.5	Diploma	01 (01.00)	03 (03.00)	01 (01.00)	05 (01.67)
2.6	Graduate	05 (05.00)	13 (13.00)	04 (04.00)	22 (07.33)
2.7	Post graduate	02 (02.00)	01 (01.00)	01 (01.00)	04 (01.33)
3	Status of Sickle cell anemia				
3.1	Sickle Cell Trait (SCT)	92 (92.00)	69 (69.00)	79 (79.00)	240 (80.00)
3.2	Sickle Cell Disease (SCD)	08 (08.00)	31 (31.00)	21 (21.00)	60 (20.00)
4	Sickle cell anemia in their family				
4.1	Family members having Sickle Cell anemia (SCT/SCD)	65 (65.00)	70 (70.00)	40 (40.00)	175 (58.33)
4.2	Don't know	35 (35.00)	30 (30.00)	60 (60.00)	125 (41.67)
5	Marital status				
5.1	Unmarried	29 (29.00)	17 (17.00)	13 (13.00)	59 (19.67)
5.2	Married	71 (71.00)	83 (83.00)	87 (87.00)	241 (80.33)
6	Family type				
6.1	Joint	93 (93.00)	80 (80.00)	85 (85.00)	258 (86.00)
6.2	Nuclear	07 (07.00)	20 (20.00)	15 (15.00)	42 (14.00)
7	Family size				
7.1	1 to 2 members	06 (06.00)	05 (05.00)	08 (08.00)	19 (06.33)
7.2	3 to 4 members	32 (32.00)	27 (27.00)	27 (27.00)	86 (28.67)
7.3	5 to 6 members	38 (38.00)	48 (48.00)	40 (40.00)	126 (42.00)
7.4	7 to 8 members	20 (20.00)	13 (13.00)	19 (19.00)	52 (17.33)
7.5	Above 8 members	04 (04.00)	07 (07.00)	06 (06.00)	17 (05.67)
8	Land holding				
8.1	Marginal (0.01 to 1.00ha)	98 (98.00)	91 (91.00)	72 (72.00)	261 (87.00)
8.2	Small (1.01 to 2.00ha)	02 (02.00)	08 (08.00)	20 (20.00)	30 (10.00)
8.3	Medium (2.01 to 4.00 ha)	00 (00.00)	01 (01.00)	08 (08.00)	09 (03.00)
8.4	Large (Above 4.00 ha)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)
9	Occupation				
9.1	Housewife	27 (27.00)	24 (24.00)	19 (19.00)	70 (23.33)

Sr. No.	Profile of Respondents	Dolvan block (n=100)	Vyara block (n=100)	Songadh block (n=100)	Total (n=300)
9.2	Daily wages earner	09 (09.00)	05 (05.00)	02 (02.00)	16 (05.33)
9.3	Farming	36 (36.00)	21 (21.00)	21 (21.00)	78 (26.00)
9.4	Farming with Animal husbandry	23 (23.00)	40 (40.00)	53 (53.00)	116 (38.68)
9.5	Farming with service	03 (03.00)	06 (06.00)	01 (01.00)	10 (03.33)
9.6	Farming with other enterprise	02 (02.00)	02 (02.00)	03 (03.00)	07 (02.33)
9.7	Government Service	00 (00.00)	02 (02.00)	01 (01.00)	03 (01.00)
10	Annual income of family				
10.1	Below ₹ 50,000	87 (87.00)	11 (11.00)	28 (28.00)	126 (42.00)
10.2	₹ 50,001 to ₹ 1,00,000	12 (12.00)	32 (32.00)	54 (54.00)	98 (32.70)
10.3	₹ 1,00,001 to ₹ 1,50,000	01 (01.00)	48 (48.00)	12 (12.00)	61 (20.30)
10.4	₹ 1,50,001 to ₹ 2,00,000	00 (00.00)	08 (08.00)	06 (06.00)	14 (04.70)
10.5	Above ₹ 2,00,000	00 (00.00)	01 (01.00)	00 (00.00)	01 (00.30)
11	Social participation				
11.1	No social participation	48 (48.00)	63 (63.00)	59 (59.00)	170 (57.00)
11.2	Participation in one organization	37 (37.00)	29 (29.00)	29 (29.00)	95 (32.00)
11.3	Participation in more than one organization	15 (15.00)	08 (08.00)	12 (12.00)	35 (11.00)
12	Source of information*				
12.1	Primary Health Centre/ Community Health Centre	07 (07.00)	11 (11.00)	05 (05.00)	23 (07.67)
12.2	ASHA workers/ Health workers	39 (39.00)	53 (53.00)	35 (35.00)	127 (42.33)
12.3	Poster/ Folder/ Handbill/ Newspaper	05 (05.00)	03 (03.00)	02 (02.00)	10 (03.33)
12.4	Health camp	57 (57.00)	17 (17.00)	14 (14.00)	88 (29.33)
12.5	Radio/ Television	01 (01.00)	00 (00.00)	00 (00.00)	01 (00.33)
13	Medical consultancy				
13.1	Medical consultancy for sickle cell anemia	30 (30.00)	71 (71.00)	66 (66.00)	167 (55.67)
13.2	No medical consultancy for sickle cell anemia	70 (70.00)	29 (29.00)	34 (34.00)	133 (44.33)

(Figure in parenthesis indicates percentage)

*Multiple responses

(1) Age

The data in Table 1 indicated that majority (57.33 per cent) of the respondents belonged to young age group, followed by 30.00 and 12.67 per cent respondents belonged to middle age and old age group, respectively. The probable reason for young aged respondents due to purposively selection of the respondents having genetic disease namely sickle cell trait or sickle cell disease.

(2) Education

The data revealed that 27.33 per cent of the respondents had secondary level of education, 23.67 per cent had primary level of education, 23.00 per cent were illiterate, 15.00 per cent had higher secondary level of education and 7.33 per cent had graduate. Only 1.67 per cent had diploma education and 1.33 per cent had post graduate. From the table it is concluded that nearly half (51.00 per cent) of the respondents had education upto secondary level. The probable reasons for young aged tribal farm women have more education due to education awareness among tribal community as well as available education facilities provided by Government of Gujarat.

(3) Status of Sickle cell anemia

The information presented in Table 1 indicated that majority (80.00 per cent) of the respondents had Sickle Cell Trait while 20.00 per cent respondents had Sickle cell Disease. Gamit, C. et al. (2014) and Soni, A. et al. (2019) were supported to present findings in the research study.

(4) Sickle cell anemia in family

It is evident from Table 1 that 58.33 per cent of the respondents knew their family members having sickle cell anemia while 41.67 per cent respondents did not know the sickle cell status of their family due to lack of awareness. The findings in this study were nearer to the findings by Jaya Kumari et al. (2024).

(5) Marital status

The data portrayed that majority (80.33 per cent) of the respondents were married and 19.67 per cent of the respondents were unmarried(single). From the table it is observed that the probable reason for unmarried status in young aged tribal farm women due to their continued education as well as a few young tribal farm women had suffering from sickle cell disease.

(6) Family Type

The data indicated that majority (86.00 per cent) of the respondents had joint family and only 14.00 per cent had

nuclear family. It is observed from the table that the great majority of tribal farm women had joint family due to their traditional tribal culture.

(7) Family size

The data revealed that 42.00 per cent of the respondents had 5 to 6 members in their family, followed by 28.67 per cent, 17.33 per cent, 6.33 per cent and 5.67 per cent of the respondents had 3 to 4 members, 7 to 8 members, 1 to 2 members and above 8 members in their families, respectively. The majority (65.00 per cent) of the respondents had family size above 5 members. It might be due to joint family traditions.

(8) Land holding

It is evident from Table 1 that majority (87.00 per cent) of the respondents belonged to marginal land holding category, followed by 10.00 per cent of the respondents belonged to small land holding category and only 3.00 per cent of respondents belonged to medium land holding category. None of them belonged to large land holding category.

(9) Occupation

The data presented that 38.68 per cent of the respondents engaged in farming with animal husbandry, followed by 26.00 per cent respondents engaged in farming while 23.33 per cent respondents were housewife and only 5.33, 3.33 and 2.33 and 1.00 per cent of the respondents engaged in daily wages work, farming with service, farming with other enterprise and Government service, respectively. The majority (64.68 per cent) of the respondents had occupation of farming with animal husbandry. It might be due to inherited land for farming.

(10) Annual income of family

The data in Table 1 indicated that 42.00 per cent of the respondents had annual income below ₹ 50,000, followed by 32.70 and 20.30 per cent of the respondents had annual income of ₹ 50,001 to ₹ 1,00,000 and ₹ 1,00,001 to ₹ 1,50,000, respectively. Only 4.70 per cent of respondents had annual income of ₹ 1,50,001 to ₹ 2,00,000 and negligible 0.30 per cent of respondent had annual income above ₹ 2,00,000. The data in Table 10 indicated that great majority (74.70 per cent) of the respondents had annual income below Rs.1,00,000.

(11) Social participation

The data revealed that more than half (57.00 per cent) of the respondents had no any type of social participation while 32.00 per cent respondents had participated in one

organization. Only 11.00 per cent of the respondents had participated in more than one organization. It is observed from the table 11 that about 43.00 per cent of the respondents had social participation in one and more organizations. Mostly they had members in *Sakhi Mandal/ SHGs/ Mahila Co-operative society etc.*

(12) Source of information

The data portrayed in Table 1 indicated that 42.33 per cent of the respondents gained information about sickle cell anemia from ASHA workers/ Health workers, followed by 38.67 per cent of respondents had not gained any type of information regarding sickle cell anemia while 29.33 per cent of respondents gained information from health camp. About 7.67, 6.67 and 6.33 per cent of respondents gained information from Primary Health Centre/ Community Health Centre, *Shibir/ Training and friends/neighbours*, respectively.

Only 3.33 and 2.67 per cent of respondents gained information from poster/handbill and internet, respectively. The probable reason for getting source of information about sickle cell anemia by respondents from organized Govt. health camps as well as ASHA workers.

(13) Medical consultancy

The data revealed that more than half (55.67 per cent) of the respondents were taking medical consultancy while 44.33 per cent respondents were not taking medical consultancy. It might be due to unawareness regarding sickle cell anemia as well as hide nature regarding disease.

Knowledge of tribal farm women regarding sickle cell anemia

Knowledge of tribal farm women regarding sickle cell anemia is presented in Table No. 2 and 3.

Table 2: Distribution of respondents according to their extent of knowledge about sickle cell anemia

(n=300)

Sr. No.	Knowledge about Sickle cell anemia	Dolvan block (n=100)	Vyara block (n=100)	Songadh block (n=100)	Total (n=300)	Rank
1	Sickle cell Anemia is a recessive genetic disease/ hereditary disease	61 (61.00)	64 (64.00)	43 (43.00)	168 (56.00)	III
2	Sickle cell anemia is an inherited red blood cell disorder (sickle shaped) in which there aren't enough healthy red blood cells to carry oxygen throughout your body	10 (10.00)	09 (09.00)	07 (07.00)	26 (08.67)	IX
3	Sickle cell Trait and Sickle cell disease are the types of sickle cell anemia	72 (72.00)	69 (69.00)	53 (53.00)	194 (64.67)	I
4	The major symptoms of sickle cell anemia are anemia, episodes of pain, frequent infection, swelling of hands and feet and delayed growth or puberty	71 (71.00)	68 (68.00)	39 (39.00)	178 (59.33)	II
5	Sickle cell disease can be diagnosed in an unborn baby (Prenatal testing) during 10-12 weeks of pregnancy	07 (07.00)	12 (12.00)	06 (06.00)	25 (08.33)	X
6	Folic acid and Vitamin-B ₁₂ are responsible for formation of RBC	24 (24.00)	14 (14.00)	04 (04.00)	42 (14.00)	V
7	Haemoglobin is an iron containing protein present in RBC	07 (07.00)	05 (05.00)	00 (00.00)	12 (04.00)	XII
8	Normally lifespan of human Red Blood Cell is approximately 120 days	18 (18.00)	05 (05.00)	00 (00.00)	23 (07.67)	XI
9	Deficiency of iron produces the anemia disease in human beings	41 (41.00)	30 (30.00)	15 (15.00)	86 (28.67)	IV
10	According to WHO, Vitamin-C is an essential for adequate absorption of iron in body	22 (22.00)	07 (07.00)	00 (00.00)	29 (09.67)	VIII
11	The normal range of Hb for women is 12-14 gm/DL	07 (07.00)	10 (10.00)	06 (06.00)	23 (07.67)	XI
12	Iron, protein & vitamin-C rich diet should be consumed for preventing anemia	09 (09.00)	18 (18.00)	09 (09.00)	36 (12.00)	VII
13	Pre-marital screening is necessary for prevention of sickle cell disease in tribal community	24 (24.00)	14 (14.00)	00 (00.00)	38 (12.67)	VI

(Figure in parenthesis indicates percentage)

The data presented in Table 2 revealed that majority (64.67 per cent) of the respondents had knowledge about types of sickle cell anemia ranked first, followed by 59.33, 56.00 and 28.67 per cent of respondents had knowledge that symptoms of sickle cell anemia, sickle cell anemia is a recessive genetic disease/hereditary disease and deficiency of iron produces the anemia disease in human beings were ranked second, third and fourth, respectively. Similar findings i.e. types of sickle cell anemia were also reported by Soni, A. et al. (2020). The data also indicated that 14.00, 12.67 and 12.00 per cent of the respondents had knowledge that folic acid & vitamin-B₁₂ are responsible for formation of RBC and Pre-marital screening is necessary for prevention of sickle cell disease in tribal community and iron, protein & vitamin-C rich diet should be consumed for prevention of anemia were ranked fifth, sixth & seventh, respectively while 9.67 per cent of them had knowledge about vitamin-C is an essential for adequate absorption of iron in body (eighth rank). Nearly 8.00 per cent of respondents had knowledge about sickle cell

anemia is an inherited red blood cell disorder (sickle shaped) in which there aren't enough healthy red blood cells to carry oxygen throughout your body and sickle cell disease can be diagnosed in an unborn baby (Prenatal testing) during 10-12 weeks of pregnancy were ranked ninth and tenth. Similar findings were also reported by Jaya Kumari and Dutta, Amit Kumar (2024). Equal i.e. only 7.67 per cent of respondents had knowledge that normally lifespan of human Red Blood Cell is approximately 120 days and normal range of Hb for women is 12-14 gm/DL (eleventh rank). Only 4.00 per cent of them had knowledge about Hb is an iron containing protein present in RBC ranked twelfth. The findings were nearer to the findings by Soni, A. et al. (2019).

It can be concluded that more than half of respondents had knowledge about types and symptoms of sickle cell anemia and hereditary disease. Nearly 46.00 per cent of respondents had less knowledge regarding technical information about sickle cell anemia.

Table 3: Distribution of respondents according to their overall knowledge about sickle cell anemia (n=300)

Sr. No.	Level of Knowledge	Dolvan block (n=100)	Vyara block (n=100)	Songadh block (n=100)	Total (n=300)
1	Very low (0 to 2 score)	40 (40.00)	37 (37.00)	64 (64.00)	141 (47.00)
2	Low (3 to 5 score)	31 (31.00)	44 (44.00)	30 (30.00)	105 (35.00)
3	Medium (6 to 7 score)	18 (18.00)	10 (10.00)	05 (05.00)	33 (11.00)
4	High (8 to 10 score)	08 (08.00)	07 (07.00)	01 (01.00)	16 (05.33)
5	Very high (Above 10 score)	03 (03.00)	02 (02.00)	00 (00.00)	05 (01.67)

(Figure in parenthesis indicates percentage)

The information presented in Table 3 revealed that 47.00 per cent of the respondents had very low level of knowledge regarding sickle cell anemia, followed by 35.00, 11.00, 5.33 and 1.67 per cent had low, medium, high and very high level of knowledge regarding sickle cell anemia, respectively. It can be concluded that majority (82.00 per cent) of respondents had very low to low level of overall knowledge regarding sickle cell anemia. The findings were nearer to the findings by Rautray K. et al, 2016 and Patil S. et al, 2017.

Relationship between the profile of tribal farm women and their knowledge regarding sickle cell anemia

The relationship between independent variables and dependent variables of respondents are presented in Table No.4

Table 4: Relationship between independent variables and dependent variables of tribal farm women

(n=300)

Sr. No.	Independent variables	Correlation co-efficient (r)
		Knowledge
X ₁	Age	-0.3399
X ₂	Education	0.5341**
X ₃	Marital status	-0.2604
X ₄	Family type	0.1150*
X ₅	Family size	-0.0493
X ₆	Occupation	0.0949
X ₇	Annual income	0.0683
X ₈	Social participation	0.1374*
X ₉	Medical consultancy	0.2826**

* Significant at 0.05 level

** Significant at 0.01 level

The result illustrated in Table 4 indicated that the independent variables *viz.* education and medical consultancy had positive and highly significant relationship with the knowledge of tribal farm women about sickle cell anemia. The positive direction of association indicated that knowledge of tribal farm women was found to be increased proportionally with increase in education and medical consultancy of tribal farm women. This might be due to that tribal farm women who had more education level, they gained information regarding sickle cell anemia from ASHA workers/ Health workers, health camp and Primary Health Centre.

Social participation and family type had positively significant relationship with the knowledge of tribal farm

women regarding sickle cell anemia. It means that joint family type and social participation of tribal farm women had positive effect of their knowledge. This might be due to the facts that tribal farm women have gained more knowledge about sickle cell anemia during their social activities and joint family culture *i.e.* traditional tribal culture.

The age, marital status, family size, occupation and annual income had no significant correlation with knowledge of tribal farm women. It means that age, marital status, family size, occupation and annual income have not affected the knowledge of tribal farm women regarding sickle cell anemia.

Table 5 : Multiple Regression Analysis of independent variables and knowledge regarding sickle cell anemia

(n=300)

Sr. No.	Independent Variables	Partial Regression Coefficient (b)	Standard error	Multiple Correlation Coefficient ‘R’	Adjusted R ²
	(Constant)	-2.89	0.843	0.561	0.315
(X ₂)	Education	0.879	0.096		
(X ₉)	Medical Consultancy	0.849	0.283		
** Significant at 0.01 level probability					

The data presented in Table 5 revealed that among the nine independent variables studied, Education (X₂) and Medical consultancy (X₉) were found to have a positive and significant contribution towards the knowledge regarding sickle cell anemia. The multiple correlation coefficient (R) was 0.561, indicating a moderate positive relationship between the selected independent variables and knowledge regarding sickle cell anemia. The adjusted R² value was 0.315, which indicated that Education and Medical consultancy together accounted for 31.50 per cent variation in the knowledge level of respondents regarding sickle cell anemia, while the remaining variation might be attributed to other factors not included in the study. The partial regression coefficient for Education (0.879) was slightly higher than that of Medical consultancy (0.849), indicating that Education had a comparatively stronger influence on the knowledge level of respondents. This implies that respondents with higher educational attainment and better access to medical consultation possessed greater knowledge regarding sickle cell anemia.

The fitted regression model can be expressed as:

$$Y = -2.89 + 0.879(X_2) + 0.849(X_9)$$

Where,

Y = Knowledge regarding sickle cell anemia

X₂ = Education

X₉ = Medical Consultancy

The findings suggest that improvement in educational status and access to medical consultation services would significantly enhance the knowledge level of respondents regarding sickle cell anemia.

Table 6 : Path Coefficient showing the direct, total indirect and substantial indirect effects of independent variables on knowledge regarding sickle cell anemia

(n=300)

Sr. No.	Variables	Direct effect	Total indirect effect	Substantial indirect effect through
X ₁	Age	-0.061	-0.279	0.022 (X ₆)
X ₂	Education	0.408**	0.126	0.085 (X ₉)
X ₃	Marital status	-0.119	-0.007	0.048 (X ₆)
X ₄	Family type	0.091	0.024	0.045 (X ₂)
X ₅	Family size	0.067	-0.116	0.011 (X ₇)
X ₆	Occupation	0.140*	-0.045	0.020 (X ₈)
X ₇	Annual income	-0.057	0.125	0.119 (X ₂)
X ₈	Social participation	0.099	0.038	0.032 (X ₂)
X ₉	Medical consultancy	0.296*	-0.013	0.118 (X ₂)
	Residual: 0.828			

The findings of the present study indicated that education and medical consultancy significantly contributed towards the knowledge regarding sickle cell anemia. These findings are in conformity with the results reported by Parmar *et al.* (2024), who observed that educational level significantly influenced respondents' knowledge and decision-making behaviour. Similar findings were also reported by Sanjay *et al.* (2024), who found that information and advisory services positively influenced awareness and knowledge levels among rural respondents.

Direct Effect

The data presented in Table 6 revealed that education (0.408) exerted the highest positive direct effect on knowledge regarding sickle cell anemia, followed by medical consultancy (0.296), occupation (0.140), social participation (0.099), family type (0.091), family size (0.067), while age (-0.061), annual income (-0.057) and marital status (-0.119) exerted negative direct effects on knowledge.

Among all the independent variables, education and medical consultancy showed comparatively higher positive direct effects, indicating that these variables played a crucial role in enhancing respondents' knowledge regarding sickle cell anemia. The results suggest that respondents possessing higher education and frequent medical consultation were more knowledgeable about the sickle cell disease.

Total Indirect Effect

The findings further indicated that age (-0.279) exerted the highest negative total indirect effect on knowledge regarding sickle cell anemia, followed by family size (-0.116), while education (0.126), annual income (0.125), social participation (0.038), family type (0.024) and occupation (-0.045) showed varying levels of indirect influence.

The results revealed that education and annual income contributed positively to knowledge through their association with other variables. On the contrary, age and family size negatively influenced knowledge through indirect pathways.

Substantial Indirect Effect

The analysis of substantial indirect effects indicated that annual income (0.119) and medical consultancy (0.118) exerted their highest indirect influence through education (X_2). Education itself showed a substantial indirect effect through medical consultancy (0.085), indicating a strong interrelationship between these two variables.

Marital status (0.048) showed its major indirect effect through occupation (X_6), family type (0.045) through education (X_2), social participation (0.032) through education

(X_2), age (0.022) through occupation (X_6), occupation (0.020) through social participation (X_8), and family size (0.011) through annual income (X_7).

The path coefficient analysis clearly revealed that education and medical consultancy were the most important determinants influencing knowledge regarding sickle cell anemia. The results are in line with the findings of Vinaya Kumar *et al.* (2017), who reported that educational and information-related variables exerted significant direct and indirect effects on farmers' decision-making behaviour. Similar observations were reported by Sanjay *et al.* (2024), who found that knowledge related behaviour was substantially influenced by socio-economic and communication characteristics through both direct and indirect effects. The findings are also supported by Parmar *et al.* (2024), who reported that educational status had a significant positive influence on awareness and behavioural outcomes of respondents.

CONCLUSION

It is clearly indicated from the results of this study that majority of tribal farm women had young aged, sickle cell trait status, married, in joint family, above five members in family, belonged to marginal land holding, annual income below Rs.1,00,000 and nearly half of tribal farm women had education upto secondary level. More than half of tribal farm women had no any type of social participation but they were taking medical consultancy and majority of tribal farm women gained information about sickle cell anemia from ASHA workers/ Health workers and health camps. Majority of tribal farm women had very low to low level of knowledge regarding sickle cell anemia. The independent variables *viz.* education and medical consultancy had positive and highly significant relationship with the knowledge of tribal farm women regarding sickle cell anemia whereas the social participation and family type had positively significant relationship with the knowledge of tribal farm women regarding sickle cell anemia. The path coefficient analysis clearly revealed that education and medical consultancy were the most important determinants influencing knowledge regarding sickle cell anemia. The findings emphasize that various extension programmes and training programmes on sickle cell anemia should be organized by health department, KVKs and other line department for tribal farm women to enhance the knowledge about sickle cell anemia among tribal community.

RECOMMENDATION

Most of the tribal people do not take medical consultancy despite they know the information about sickle cell anemia is an inherited disease, its types and symptoms.

Therefore, there is need to increase sickle cell screening, health camps, awareness programmes and training programmes in tribal areas for prevention of sickle cell anemia disease.

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CONFLICT OF INTEREST

All authors declare that they have no conflicts of interest related to this study.

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