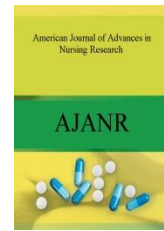




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EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING CHAGAS DISEASE AMONG NURSING STUDENTS AT SELECTED COLLEGE IN TIRUTTANI.

Gracy J^{1*}, Dr. Padmavathi R²

¹Assistant Professor, GRT College of Nursing, Tiruttani, Tamil Nadu

²Principal, GRT College of Nursing, Tiruttani, Tamil Nadu.

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ABSTRACT

A quantitative research approach with a one-group pre-test and post-test design was conducted to evaluate the effectiveness of a Structured Teaching Programmed (STP) on knowledge regarding Chagas disease among nursing students. 84 nursing students were selected through non-probability convenient sampling. The level of knowledge score was assessed by structured self-administered questionnaire. The study findings revealed that in the pre-test, 95.24% had inadequate knowledge and 4.76% had moderately adequate knowledge. After the intervention, 45.24% had adequate knowledge and 54.76% had moderately adequate knowledge. The mean knowledge score improved significantly from 7.53 ± 2.48 (pre-test) to 18.37 ± 1.85 (post-test), with a mean difference of 10.83 (43.4%). The paired t-test value ($t=33.260$, $p<0.001$) confirmed the statistical significance of the findings, indicating that the STP was effective. The study concludes that planned teaching programs are a valuable method for improving knowledge and recommends organizing awareness initiatives on Chagas disease among students.

INTRODUCTION

Chagas disease, caused by the parasite *Trypanosoma cruzi* and transmitted primarily through triatomine bugs, was first described in 1909 by Dr. Carlos Chagas. Once confined to rural areas of the Americas, it has now spread to 44 countries, including urban regions and nations in North America, Europe, and beyond. The disease is classified by the WHO as a Neglected Tropical Disease (NTD), with objectives to stop transmission by 2030, including congenital, vector-borne, and transfusion-related cases. Despite progress in diagnosis and treatment, challenges persist, worsened by the COVID-19 pandemic. With an estimated 6–7 million people infected globally and an annual death toll of around 12,000, Chagas disease now presents a significant health risk worldwide requiring

increased awareness and improved access to healthcare and detection, particularly in non-endemic areas as per the “Healthy people program” (2007) prevention of. This form of transmission is linked to the consumption of contaminated food and beverages, such as palm wine, sugar cane, tangerine juice and water, as well as food prepared on contaminated surfaces.

Additionally, the ingestion of infected armadillo blood, related to traditional medicine practices, and potentially infected bush meat are also discussed as transmission sources. Oral transmission is now considered the primary cause of acute CD in some regions including those where triatomine vectors are not present. This new understanding of oral CD highlights its potential as a food-borne zoonosis and emphasizes the need for increased awareness to reduce the disease burden in Latin America.

Chagas cardiomyopathy (CC), caused by *Trypanosoma cruzi*, is a major cause of cardiovascular

Corresponding Author

Gracy J

Email: gracyjaypal@gmail.com

Research Article



morbidity and mortality, particularly in developing countries. It affects an estimated 6 to 7 million people globally with predictions of 200,000 deaths by 2025. The World Health Organization (WHO) classifies Chagas disease (CD) as a Neglected Tropical Disease (NTD), requiring timely detection and management due to ongoing clinical and diagnostic challenges in both endemic and non-endemic areas. In May 2019, the 72nd World Health Assembly established World Chagas Disease Day on April 14th to commemorate Carlos Chagas' 1909 diagnosis of the first human case of the disease.

Dr. Suneela Garg, Chair of the Programmed Advisory Committee at NIHFWD discussed trypanosomiasis in India, noting that while human trypanosomiasis (sleeping sickness) is endemic in Africa and Latin America India faces animal trypanosomiasis. In 2016, cases were detected in infants highlighting the need for awareness and preventive measures as no vaccine exists. Dr. Garg recommended spraying insecticides, taking precautions when traveling to Chagas-endemic areas, and avoiding blood transfusions and organ transplant to reduce Chagas disease transmission risks.

Dr. Tamorish Kole discussed trypanosomiasis in India, emphasizing that while human trypanosomiasis and Chagas disease are not historically present, India faces endemic animal trypanosomiasis caused by *T. evansi* in cattle and *T. lewisi* in rats. Sporadic human infections with animal trypanosomes have been reported, but the disease is not wide spread. Dr. Kole stressed the need for awareness early diagnosis and timely treatment, while also highlighting the importance of avoiding potentially harmful anti-trypanosomal therapy in stable patients and monitoring changes in the disease's epidemiology.

Joshi PP, Shegokar VR, Powar RM, et al., (2005) conducted a study on Human trypanosomiasis caused by *Trypanosoma evansi* in India: the first case report. We report an Indian farmer who had fluctuating trypanosome parasitemia associated with febrile episodes for five months. Morphologic examination of the parasites indicated the presence of large numbers of trypanosomes belonging to the species *Trypanosoma evansi*, which is normally a causative agent of animal trypanosomiasis known as surra. Basic clinical and biologic examinations are described, using several assays, including parasitologic, serologic, and molecular biologic tests, all of which confirmed the infecting species as *T. evansi*. Analysis of cerebrospinal fluid indicated no invasion of the central nervous system (CNS) by trypanosomes. Suramin, a drug used exclusively for treatment of early-stage human African trypanosomiasis with no CNS involvement, effected apparent cure in the patient. This is the first case reported of human infection due to *Trypano-*

somaevansi, which was probably caused by transmission of blood from an infected animal.

Shegokar VR, Powar RM, et al., (2006) conducted a study on short report: Human trypanosomiasis caused by *Trypanosoma evansi* in a village in India: preliminary serologic survey of the local population. The study reveals that after discovery of the first recorded case of human infection with *Trypanosoma evansi*, serologic screening of 1,806 persons from the village of origin of the patient in India was performed using the card agglutination test for trypanosomiasis and *T. evansi*. A total of 410 (22.7%) people were positive by whole blood, but only 81 were confirmed positive by serum. However, no trypanosomes were detected in the blood of 60 people who were positive at high serum dilution. The results probably indicate frequent exposure of the human population to *T. evansi* in the study area, which suggests frequent vector transmission of parasites to humans. Although *T. evansi* is not infective for humans, a follow-up of seropositive persons is required to observe the evolution of human infection with this parasite.

The initiative seeks to raise awareness about Chagas disease, which continues to impact millions globally, particularly in endemic Latin America. Despite its prevalence, there is a critical lack of knowledge about the disease. By promoting education and awareness, the initiative aims to improve prevention, early detection, and access to treatment, ultimately saving lives and enhancing health outcomes in affected regions.

For nursing professionals, this understanding is vital as they often play frontline roles in health systems ensuring early detection promoting preventive care, and supporting effective treatment strategies. Empowering nurses with this knowledge strengthens their capacity to address emerging and neglected diseases, reducing the global burden of Chagas disease and contributing to overall healthcare excellence.

OBJECTIVES

1. To assess the pre-test and post-test levels of knowledge about Chagas Disease among nursing students.
2. To evaluate the effectiveness of a Structured Teaching Programme on knowledge regarding Chagas Disease among nursing students.
3. To associate the mean difference in knowledge scores with selected demographic variables of nursing students.

RESEARCH METHODOLOGY

Quantitative research approach and one group pre-test and post-test research design was used to assess the effectiveness of Planned teaching programme on



knowledge of chagas disease among students. The 84 students were chosen by non- probability convenient sampling technique. The level of knowledge score was assessed by structured self - administered questionnaire. Structured self- administered questionnaire consists of 25 questions. Each correct answer carried 1 mark. Each question had only one right answer. The total score of the tool was 25& the scores were interpreted as below, 76%-100%-Adequate knowledge (above17) 50%-75%-Moderately adequate knowledge (9-16) <50% - nadequate knowledge (<8)

A formal permission was obtained from the Principal of GRT College of Nursing, Tiruttani. Data collection was carried out from 26.08.2020 to 31.08.2020. The 84 nursing students meeting the inclusion criteria was selected using the non-probability convenient sampling technique. The purpose of the study and procedural instructions were explained in detail to the students, and informed consent was obtained, with assurances of confidentiality. After obtaining the data, the researcher delivered a health talk on Chagas disease. After that, the post-test was carried out on the fifth day, 31.08.2024.

RESULTS

The table1 shows that most of the Nursing Students,84(84%) were aged between20 – 21 yearsandwere female, 52(61.9%) were residing in rural area, 84(100%0were studying III Year,41(48.8%)of fathers weres killed agricultural and fishery workers,49(58.3%)of mothers were unemployed, 43(51.2%) had monthly income of <10,001, 60(71.4%) were Hindus, 81(96.4%)belonged to nuclear family and84(100%)had not received previous training courses regarding chagas.

SECTIONB: Assessment of Level of Knowledge Regarding Chagas Disease Among Nursing Students.

The above table 2 shows that in the pretest, 80(95.24%) had inadequate knowledge regarding Chagas disease and 4(4.76%) had moderately adequate knowledge and after the intervention, 38(45.24%) had adequate knowledge and 46(54.76%) had moderately adequate knowledge regarding Chagas disease among Nursing Students.

SECTIONC: Effectiveness of Structured Teaching Programme on Knowledge Regarding Chagas Disease Among Nursing Students.

The table 3 shows that the pretest mean score of knowledge was 7.53 ± 2.48 and the post-test mean score was 18.37 ± 1.85 . The mean difference score was 10.83 and the mean difference percentage was 43.4%. The calculated paired “t” test value of $t=33.260$ was statistically significant at $p<0.001$ level which clearly indicates that Structured Teaching Programme on knowledge regarding Chagas Disease administered among nursing Students was found to effective in improving the level of knowledge among them in the post test.

SECTIOND: Association of Level of Knowledge Regarding Chagas Disease Among Nursing Students with Selected Demographic Variables.

The table 4shows that the demographic variable area of residence ($\chi^2=6.506$, $p=0.039$) had shown statistically significant association with post-test level of knowledge regarding ChagasDisease among Nursing Students at $p<0.05$ leveland the otherdemographic variables had not shown statistically significant association with post-test level of knowledge regarding Chagas Disease among Nursing Students at $p<0.05$.

Table 1: Frequency and percentage distribution of demographic variables of the Nursing Students. (n=84)

Demographic Variables	Frequency(f)	Percentage (%)
Age in years		
18–19	-	-
20–21	84	100.0
22–23	-	-
>24	-	-
Sex		
Male	-	-
Female	84	100.0
Area of residence		
Urban	4	4.8
Semiurban	28	33.3
Rural	52	61.9
Level of Qualification (B.Sc. Nursing)		
I Year	-	-



II Year	-	-
III Year	84	100.0
IV Year	-	-
Occupation of father		
Legislators senior officials and managers	-	-
Professional	11	13.1
Technicians and associate professional	-	-
Clerks	-	-
Skilled workers and shop market sales workers	32	38.1
Skilled agricultural and fishery workers	41	48.8
Graftand relatedtrade workers	-	-
Plant and Machine operators and assemblers	-	-
Elementary occupation	-	-
Unemployed	-	-
Occupation of mother		
Legislators, senior officials and managers	-	-
Professional	-	-
Technicians and associate professional	-	-
Clerks	-	-
Skilled workers and shop market sales workers	9	10.7
Skilled agricultural and fishery workers	26	31.0
Graft and related trade workers	-	-
Plant and Machine operators and assemblers	-	-
Elementary occupation	-	-
Unemployed	49	58.3
Monthly income in rupees		
>199,862	-	-
99,931-199,861	-	-
74,755-99,930	-	-
49,962-74,755	-	-
29,973-49,961	-	-
10,003-29,972	41	48.8
<10,001	43	51.2
Religion		
Hindu	60	71.4
Christian	23	27.4
Muslim	1	1.2
Others	-	-
Type of family		
Nuclear	81	96.4
Joint	3	3.6
Extended	-	-
Receiving previous training courses regarding this topic		
Yes	-	-
No	84	100.0
If yes,		
Online	-	-
College	-	-
Consultation	-	-
Face-to-Face	-	-
Handouts	-	-
Other	-	-



None	84	100.0
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Table 2: Frequency and percentage distribution of pre-test and post-test level of knowledge regarding Chagas disease among nursing students. (n=84)

Level of Knowledge	Pretest		Post Test	
	F	%	F	%
Inadequate knowledge ($\leq 50\%$)	80	95.24	-	-
Moderately adequate (51–75%)	4	4.76	46	54.76
Adequate ($>75\%$)	-	-	38	45.24

Table 3: Effectiveness of Structured Teaching Programme on knowledge regarding Chagas Disease among Nursing Students. N=84

Knowledge	Mean	S. D	Mean Difference & %	Paired “t” test & p-value
Pretest	7.53	2.48	10.83	t=33.260
Post Test	18.37	1.85	(43.4%)	p=0.0001, S***

Table 4: Association of post-test level of knowledge regarding Chagas Disease among Nursing Students with their selected demographic variables. N=84.

Demographic Variables	Moderately Adequate knowledge (51–75%)		Adequate Knowledge ($>75\%$)		Chi-Square Test & p-value
	No.	%	No.	%	
Age in years					-
18–19	-	-	-	-	
20–21	46	54.8	38	45.2	
22–23	-	-	-	-	
>24	-	-	-	-	
Sex					-
Male-	-	-	-	-	
Female	46	54.8	38	45.2	
Area of residence					$\chi^2=6.506$ d.f=2 p =0.039 S*
Urban	1	1.2	3	3.6	
Semiurban	11	13.1	17	20.2	
Rural	34	40.5	18	21.4	
Level of qualification (B.Sc.(N))					
I Year	-	-	-	-	
II Year	-	-	-	-	
III Year	-	-	-	-	
IV Year	-	-	-	-	
Occupation of father					$\chi^2=0.049$ d.f=2 p=0.976 N.S
Legislators, senior officials and managers	-	-	-	-	
Professional	6	7.1	5	6.0	
Technicians and associate professional	-	-	-	-	
Clerks	-	-	-	-	
Skilled workers and shop market Sales workers	18	21.4	14	16.7	
Skilled agricultural and fishery workers	22	26.2	19	22.6	
Graft and related trade workers	-	-	-	-	
Plant and Machine operators and assemblers	-	-	-	-	
Elementary occupation	-	-	-	-	
Unemployed	-	-	-	-	



Demographic Variables	Moderately Adequate knowledge (51–75%)		Adequate Knowledge (>75%)		Chi-Square Test & p-value
	No.	%	No.	%	
Occupation of mother					
Legislators, senior officials and managers	-	-	-	-	$\chi^2=1.870$ d.f=2 p=0.392 N.S
Professional	-	-	-	-	
Technicians and associate professional	-	-	-	-	
Clerks	-	-	-	-	
Skilled workers and shop market salesworkers	3	3.6	6	7.1	
Skilled agricultural and fishery workers	15	17.9	11	13.1	
Graftand related trade workers	-	-	-	-	
Plant and Machine operators and assemblers	-	-	-	-	
Elementary occupation	-	-	-	-	
Unemployed	28	33.3	21	25.0	
Monthly income in rupees					
>199,862	-	-	-	-	$\chi^2=0.058$ d.f=1 p=0.810 N.S
99,931-199,861	-	-	-	-	
74,755-99,930	-	-	-	-	
49,962-74,755	-	-	-	-	
29,973-49,961	-	-	-	-	
10,003-29,972	23	27.4	18	21.4	
<10,001	23	27.4	20	23.6	
Religion					
Hindu	32	38.1	28	33.3	$\chi^2=0.904$ d.f=2 p=0.636 N.S
Christian	13	15.5	10	11.9	
Muslim	1	1.2	0	0	
Others	-	-	-	-	
Type of family					
Nuclear	45	53.6	36	42.9	$\chi^2=0.577$ d.f=1 p=0.448 N.S
Joint	1	1.2	2	2.4	
Extended	-	-	-	-	
Receiving previous training Courses regarding this topic					
Yes	-	-	-	-	-
No	46	54.8	38	45.2	

Demographic Variables	Moderately Adequate knowledge (51–75%)		Adequate Knowledge (>75%)		Chi-Square Test & p-value
	No.	%	No.	%	
If yes,					
Online	-	-	-	-	-
College	-	-	-	-	
Consultation	-	-	-	-	
Face-to-Face	-	-	-	-	
Handouts	-	-	-	-	
Other	-	-	-	-	
None	46	54.8	38	45.2	

*p<0.05, S–Significant, N.S–Not Significant.



Figure 1: Schematic representation of the lifecycle of *Trypanosoma cruzi*

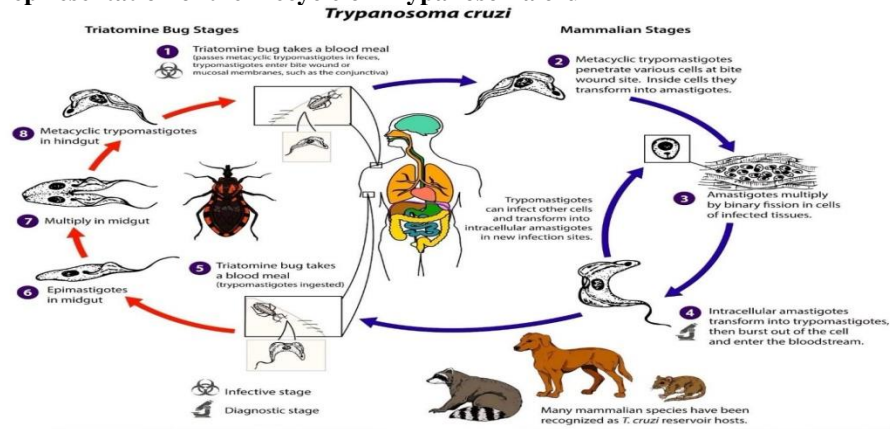


Figure 2: Percentage distribution of area of residence of the Nursing Students.

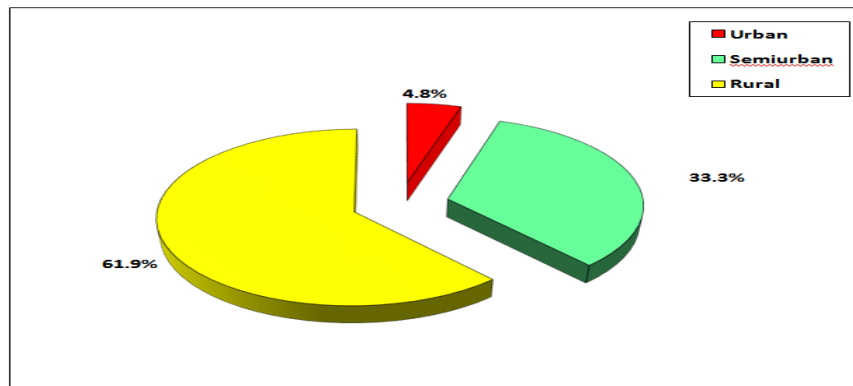


Figure 3: Percentage distribution of pretest and post-test level of knowledge regarding Chagas disease among Nursing Students

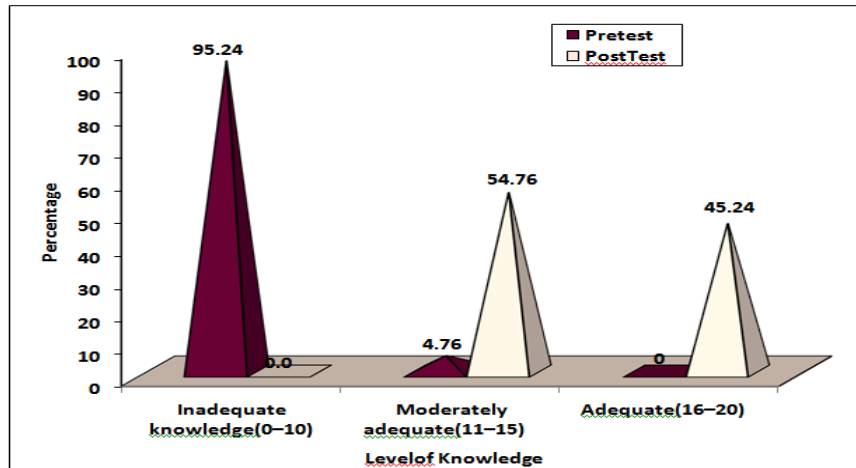
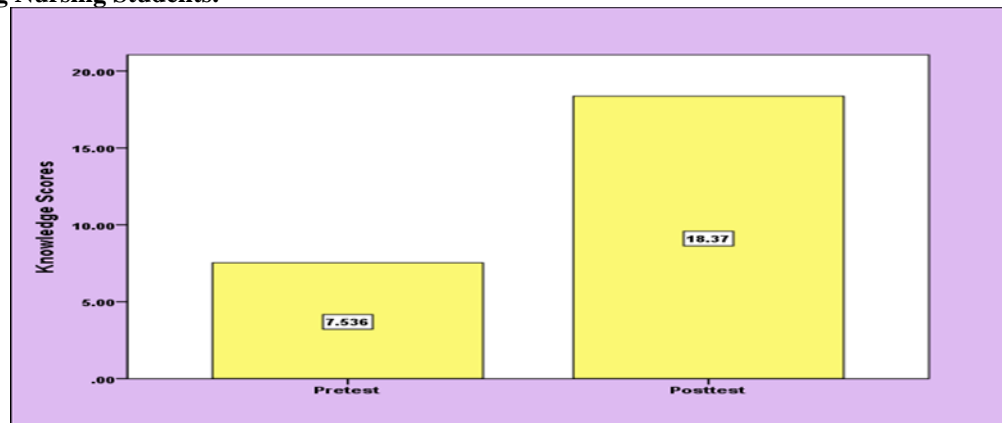


Figure 4: Simple bar diagram showing the comparison of pretest and post-test knowledge scores regarding Chagas Disease among Nursing Students.



DISCUSSION

Chagas disease, caused by *Trypanosoma cruzi*, is a neglected tropical disease transmitted mainly by triatomine bugs in Latin America. It progresses from an often a symptomatic acute phase to chronic phase, leading to severe complications like heart failure and gastrointestinal disorders. Due to its silent progression, many remain undiagnosed until later stages. It can also spread through blood transfusions, organ transplants, and from mother to child. While treatment is most effective in the acute phase, no vaccine exists. Public awareness, early diagnosis, vector control, and improved living conditions are essential for prevention and control.

The frequency and percentage distribution of level of knowledge regarding chagas disease among students were assessed. The findings revealed that, in the pre-test, 95.24% had inadequate knowledge and 4.76% had moderately adequate knowledge. After the intervention, 45.24% demonstrated adequate knowledge and 54.76% had moderately adequate knowledge. The mean knowledge score improved significantly from 7.53 ± 2.48 (pre-test) to 18.37 ± 1.85 (post-test), with a mean difference of 10.83 (43.4%). The paired t-test value ($t=33.260$, $p<0.001$) confirmed the statistical significance of the findings, indicating that the STP was effective. The study concludes that planned teaching programs are a valuable method for improving knowledge and recommends organizing awareness initiatives on Chagas disease among students.

CONCLUSION

In conclusion, the study demonstrated that the Structured Teaching Program (STP) effectively enhanced the knowledge of nursing students regarding Chagas disease. The significant improvement in knowledge

scores, from 7.53 ± 2.48 in the pre-test to 18.37 ± 1.85 in the post-test, along with the statistical significance ($t=33.260$, $p<0.001$), highlights the effectiveness of the educational intervention. The findings suggest that planned teaching programs are a valuable tool for increasing awareness and understanding of Chagas disease. Therefore, it is recommended to organize similar awareness initiatives to further educate students and healthcare professionals on the importance of early detection, prevention, and management of this neglected tropical disease.

IMPLICATIONS

Future research could explore the effectiveness of STPs in various other healthcare settings and among different health care professionals to further assess its impact on neglected disease awareness and management.

Recommendations for Nursing Education

In light of the global migration patterns nursing education should address diseases like Chagas that can spread beyond endemic areas. Incorporating global health topics into nursing programs will better prepare nurses to deal with emerging diseases in various contexts.

Continuing education programs should be mandatory for practicing nurses focusing on emerging global health threats. These programs can be updated regularly to include information on diseases like Chagas and how they may affect populations in non-endemic regions.

Using case studies and real-world examples from diverse geographical regions will help nursing students understand how diseases like Chagas can affect populations in non-endemic areas. This will help them recognize potential cases and prevent further transmission.



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