Original Article

IJCIH
Converging Healthcare & Technology

International Journal of Convergence in Healthcare

Published by
IJCIH & Pratyaksh Medicare LLP

www.ijcih.com

A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Cold Chain among Junior Health Assistant (Female) Students in Selected Junior Health Assistant (Female) Training Center of Raichur, Karnataka

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Abstract

Introduction: An pre experimental study was conducted to assess the effectiveness of Structured Teaching Programme on knowledge regarding cold chain among Junior Health Assistant (Female) Students in selected Junior Health Assistant (Female) Training Center. Objectives:

- To assess the existing level of knowledge of junior health assistant (female) students regarding cold chain.
- To implement structured teaching programme on cold chain.
- To analyze the effectiveness of structured teaching program on cold chain.
- To identify the relationship between the knowledge of junior health assistant (Female) students regarding cold chain with selected variables.

Methodology: The research design adopted for the study was one group pre test post test pre experimental design. A sample of 30 Junior Health Assistant (Female) Students, who were studying in selected Junior Health Assistant (Female) Training Center, Raichur was selected by complete enumeration method. A self administered questionnaire consisting of part-I and part-II was used for data collection.

Part-I: Dealt with Demographic Characteristics of the Sample.

Part-II: Included knowledge items related to cold chain.

The tool was validated by 7 experts, of which 5 are nursing experts and 2 are dotors in community medicine. Pilot study was conducted, to establish reliability and feasibility of the tool. The computed value of co-efficient of correlation was r = 0.86 which the tool was highly reliable.

Data was collected by using a self-administered questionnaire. The data was analyzed by using Descriptive and Inferential statistics such as percentage distribution, mean, standard deviation, paired ‘t’test and chi square test.

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Results: Among 30 respondents, majority of the Junior Health Assistant (Female) Students were within the age group of 20-24 years (15 i.e.50%), two-third of the Junior Health Assistant (Female) Students (23 i.e. 76.67%) finished P.U.C. as their basic education, two-third of the Junior Health Assistant (Female) Students (23 i.e. 76.67%) were Hindus, 15of the participants(50%) were not experienced during their community and clinical postings and 22 of the respondents (73.33%) had got information from health care professionals.In pre test, the mean score of the sample was 17.57 (SD = 5.62) and the post test mean score was 29.73 (SD = 4.68) with paired't' value of 10.29. This showed that the Structured Teaching Programme was effective in enhancing the knowledge level of the sample regarding cold chain.

Conclusion: In pre test, among 30 Junior Health Assistant (Female) Students majority of the participants (18 i.e. 60.00%) had average knowledge and 12 participants (40.00%) had low knowledge where as in post test, 23 participants (76.67%) had high knowledge followed by 6 participants (20.00%) with average knowledge and 1 participant (3.33%) had low knowledge. This implies that there is a marked improvement in the knowledge level of the participants after implementation of structured teaching programme.

Keywords: *Effectiveness, structured Teaching Programme , knowledge , cold chain, Junior Health Assistant, Students & Training Center.*

Introduction

Immunization is one of the most well-known, effective and key intervention for protection from childhood diseases. With the implementation of universal Immunization programme, significant achievements have been made in preventing and controlling the vaccine preventable disease i, e. Diphteria, Pertusis, Tetanus, Polio, Measles, childhood Tuberrculosis and Hepatitis B. Since 2006-J.E-Japnese Encephelitis vaccine has been introduced under routine immunization in the higher burden districts and phased manner. The immunization coverage has seen an improve ment over the years.. However there is further need for improvement especially in DPT3 and OPV3coverage and reducing drop outs. Maintenance of cold chain is the corner stone for the success of immunization.. Immunization is a process of introduction of live or killed vaccines in to the individual system.

NEED FOR THE STUDY: Children are our future and most precious resources.The child health refers to the promotive, preventive, curative and rehabilitative health care and it comes under maternal and child health.The protection of health of children is the prime importance for building of a sound and healthy nation.

World Health organization (WHO) in 1989, started child survival and safe motherhood (CSSM) programme.Govt. of India implemented in 1992and in 1997 RCH programme gave more importence to immunization.

"Immunization is a process of protecting an individual from a disease through introduction of a live, killed or partial component of invading organism in to the individual system in the form of vaccine."

Vaccine is a preparation of an antigen for preventive inoculation which when administered stimulates specific antibody formulation in the body.

"Cold chain is the system of transporting and storing vaccines within the safe temperature range of +20 to +80c from the place of manufacture to the point of administration. It ensures that people receive an effective vaccine that has retained its potency and has not been affected by heat or cold."10

Objectives of the Study

- To assess the existing level of knowledge of junior health assistant (female) students regarding cold chain.
- To implement structured teaching programme on cold chain.
- To analyze the effectiveness of structured teaching programme on cold chain.
- To identify the relationship between the knowledge of junior health assistant (female)students regarding cold chain with selected variables.

Hypothesis: On the basis of the objectives of the study the following hypotheses have been formulated.

H1 -There will be significant difference between the pre-test and post-test knowledge scores of junior health assistant (female) students with regard to cold chain.

H_2 -There will be significant relationship between the knowledge scores of junior health assistant (female) students on cold chain with selected variables.

Methodology is the most important part of any research study and is defined as the way the pertinent information is gathered in order to answer the research question or analyze the research problem.

Research Approach: An **evaluative approach** was considered as the measure to evaluate the effectiveness of structured teaching programme on knowledge regarding cold chain among junior health assistant (female) students.

Research Design

O1 X O2

In experimental design**, one group pre test, post test pre experimental design** was selected for the present study. A pre test was conducted to the sample, structured teaching programme was intervened and a post test was conducted after a gap of seven days to assess the effectiveness of structured teaching programme

Setting of the study

The present study was conducted at junior health assistant (female) training centre of Raichur. The training center of Raichur has been selected purposively for the present study, which is functioning under Government of Karnataka.

Population: Population is a complete set of persons or objects that possess a common characteristic that is of interest to the research. The target population is "group of people or objects to which the researcher wishes to generalize the findings of the study".

Sample: Sample is a subset of the units which comprise the population. In the present study; sample consists of 30 junior health assistant (female) students who were studying in selected junior health assistant (female) training center, Raichur.

Sampling technique Sampling is the process of selecting the portion of the population to represent the entire population.

Sample size: 30 junior health assistant (female) students are considered as sample for the present study.

Method of Data collection: Data collection is a gathering of information relevant to a research problem.

Development of the Tool: A structured self-administered questionnaire was prepared by the investigator to assess the knowledge of the junior health assistant (female) students regarding cold chain.

A thorough review of literature, suggestions from guide and subject's experts and cold chain module helped in the selection of content for developing the tool .

Description of the Tool: The instrument was divided into 2 parts, namely **Part-I and Part-II**

Part-I: It consists of 5 items regarding the demographic information of the subjects such as age, basic educational qualification, religion, previous experience during clinical postings, and sources of information.

Part-II

It consists of 35 knowledge items related to cold chain. These items were

closed ended, multiple choice questions. Each correct response has been scored with one mark. Total score was 35.

The knowledge level of the respondents was classified into 3 categories.

Low knowledge	0-50 per cent	0 to 17
Average knowledge	51-75 per cent	18 to 26
High knowledge	above 75 per cent	27 and above

Ethical consideration :Permission was obtained from the Institutional Ethical Committee, Navodaya College of Nursing, Raichur.

- Permission was obtained from the District Surgeon, Government Hospital Raichur and Principal of junior health assistant (female) Training Center, Raichur.
- Consent was obtained from all the participants.

Results

Data analysis is the systematic, organization and synthesis of research data, and testing of research hypothesis by using the obtained data.45

The analysis and interpretation of data is presented under the following sections.

Section I: Frequency and Percentage distribution of junior health assistant (female) students based on demographic characteristics.

Section II: Knowledge of junior health assistant (female) students.

a. Level of knowledge of junior health assistant (female) students on cold chain.

b. Frequency and Percentage distribution of level of knowledge of junior health assistant (female) students in pre-test and post-test regarding cold chain.

c. Frequency and Percentage distribution of level of knowledge of junior health assistant (female) students in specific areas related to cold chain.

d. Mean and Standard deviation of pre-test and post-test knowledge score of junior health assistant (female) students in specific areas related to cold chain.

Section-III: Comparison of pre-test and post-test knowledge scores for assessing the effectiveness of

structured teaching programme on cold chain by using Paired't' test.

Section-IV: Association between the post-test knowledge scores of junior health assistant (female) students on cold chain with their demographic variables by using "Chi-square".

Section-I: This section deals with the frequency and percentage distribution of selected demographic characteristics of junior health assistant (female) students. The demographic characteristics included in the present study were: age, basic educational qualification, religion, previous experience and sources of information.

Table 1: Frequency and percentage distribution of demographic characteristics of junior health assistant (female) students. (N = 30)

Sample Characteristics	Frequency (f)	Percentage (%)
Age in years		
15-19	11	36.67
20-24	15	50.00
25-29	4	13.33
Basic Educational Qualification		
S.S.L.C	7	23.33
P.U.C	23	76.67
Religion		
Hindu	23	76.67
Muslim	5	16.66
Christian	2	6.67
Previous experience		
Yes	15	50.00
No	15	50.00
Sources of Information.		
Journal	2	6.67
Television	2	6.67
Newspaper	2	6.67
Relatives	1	3.33
Friends	1	3.33
Health professionals	22	73.33

Table 2: Level of knowledge of Junior Health Assistant (Female) Students regarding cold chain

Level of Knowledge	Percentage	Range of score
Low	0 to 50	0-17
Average	51 to 75	18-26
High	Above 75	27 and above

Table-2 reveals the knowledge of sample regarding cold chain. The knowledge of sample was assessed by using a structured self administered questionnaire with 35 items regarding cold chain. The tool score was 35. The junior health assistant (female) students who score between 0-17 were considered to have Low knowledge; the subjects with score between18-26 were considered to have average knowledge and who score 27 and above (27-35) were considered to have high knowledge about cold chain.

Table 3: Frequency and Percentage distribution of level of knowledge of junior health assistant (female) students in specific areas related to cold chain. (N = 30)

Knowledge In specific areas	Pre test						Post test					
	Low < 50 %		Average 51-75%		High > 75%		Low < 50 %		Average 51-75%		High > 75%	
	F	%	F	%	F	%	F	%	F	%	F	%
Cold chain	17	56.67	12	40.00	1	3.33	0	0.00	0	0.00	30	100.00
Cold chain system	18	60.00	10	33.33	2	6.67	1	3.33	5	16.67	24	80.00
Cold chain equipments	9	30.00	13	43.33	8	26.67	0	0.00	3	10	27	90.00
Six killer disease vaccine	29	96.67	1	3.33	0	0.00	8	26.67	15	50.00	7	23.33
Responsibilitie s of junior health assistants in management of cold chain	23	76.67	7	23.33	0	0.00	2	6.67	6	20.00	22	73.33

Table 3 villustrates the frequency and percentage distribution of knowledge levels of junior health assistant (female) students in specific areas related to cold chain in pre test and post test. The specific areas included were: cold chain, cold chain

system, cold chain equipment, six disease killer vaccine and responsibilities of junior health assistants in management of cold chain.

In pre test, it was observed that 17 (56.67%) respondents had low knowledge related to cold chain, followed by average knowledge (12 i.e. 40.00%) and only one respondent (i.e. 3.33%) had High knowledge. In post test, 30 Participants (100.00%) had high knowledge.

Regarding cold chain system, in pre test, 18 respondents (60.00%) had low knowledge, followed by 10 respondents (33.33%) had Average knowledge and 2 participants (6.67%) had High knowledge. Whereas in post test, 24 (80.00%) respondents had high knowledge, followed by 5 respondents (16.67%) had average knowledge and only 1 participant (3.33%) had Low knowledge.

Related to cold chain equipments, pretest revealed that 13 respondents (43.33%) had Average knowledge followed 9 respondents (i.e. 30.00%) had Low knowledge and 8 respondents (26.67%) had High knowledge. In post test, 27 respondents (i.e.90.00%) had high knowledge, 3 respondents (10.00%) had average knowledge.

Related to six killer disease vaccine, in pre test, 29 respondents (i.e. 96.67%) had low knowledge and 1 participant (i.e. 3.33%) had average knowledge. In post test, (15 i.e. 50.00%) participants had Average knowledge followed by 8 respondents (26.67%) had Low knowledge and 7 participants (23.33%) had High knowledge

Related to responsibilities of junior health assistants in management of cold chain, in pre test, 23 participants (i.e. 76.67%) had low knowledge and 7 participants (i.e. 23.33%) had average knowledge. In post test, 22 participants (i.e. 73.33%) had high knowledge, 6 participants (i.e. 20.00%) had average knowledge and 2 participants (i.e. 6.67%) had low knowledge.

The findings with regard to knowledge in specific areas of cold chain proved that the structured teaching programme on cold chain was effective.

Table 4: Mean and Standard Deviation of pre test and post test knowledge scores of Junior Health Assistant (Female) Students in specific areas related to Cold chain. (N = 30)

Specific areas	Pre test		Post test	
	Mean	Standard deviation	Mean	Standard deviation
Overall knowledge	17.57	5.62	29.73	4.68
Cold chain	2.53	0.57	3.00	0.00
Cold chain system	2.30	0.84	4.53	0.90
Cold chain equipments	10.10	3.26	13.86	1.31
Six killer disease vaccine	1.80	1.21	5.67	2.26
Responsibilities of junior health assistants in management of cold chain	0.84	0.79	2.67	0.61

Table 4 represents the mean and standard deviation of pre test and post test knowledge scores in specific areas of cold chain. It clearly describes that the overall knowledge Mean score in pre test was increased from 17.57±5.62 to 29.73±4.68 in post test. This depicts that Structured Teaching Programme was effective in

improving the Overall knowledge of Junior Health Assistant (Female) Students regarding cold chain.

The mean score of the sample regarding cold chain was increased from 2.53±0.57 to 3.00±0.00. Related to cold chain system, the pre test mean score was 2.30±0.84 and in post test it was 4.53±0.90, which shows improvement. Improvement was observed with regard to cold chain equipment (pre test score is 10.10±3.26 and post test score is 13.87±1.31). Related to six disease killer vaccine the Mean score was improved from 1.80±1.21 to 5.67±2.26 in post test. Related to responsibilities of junior health assistant in management of cold chain the Mean score was improved from 0.84±0.79 to 2.67±0.61.

On the whole, post test Mean scores were higher than pre test mean scores in all the specific areas of cold chain indicating the effectiveness of Structured Teaching Programme.

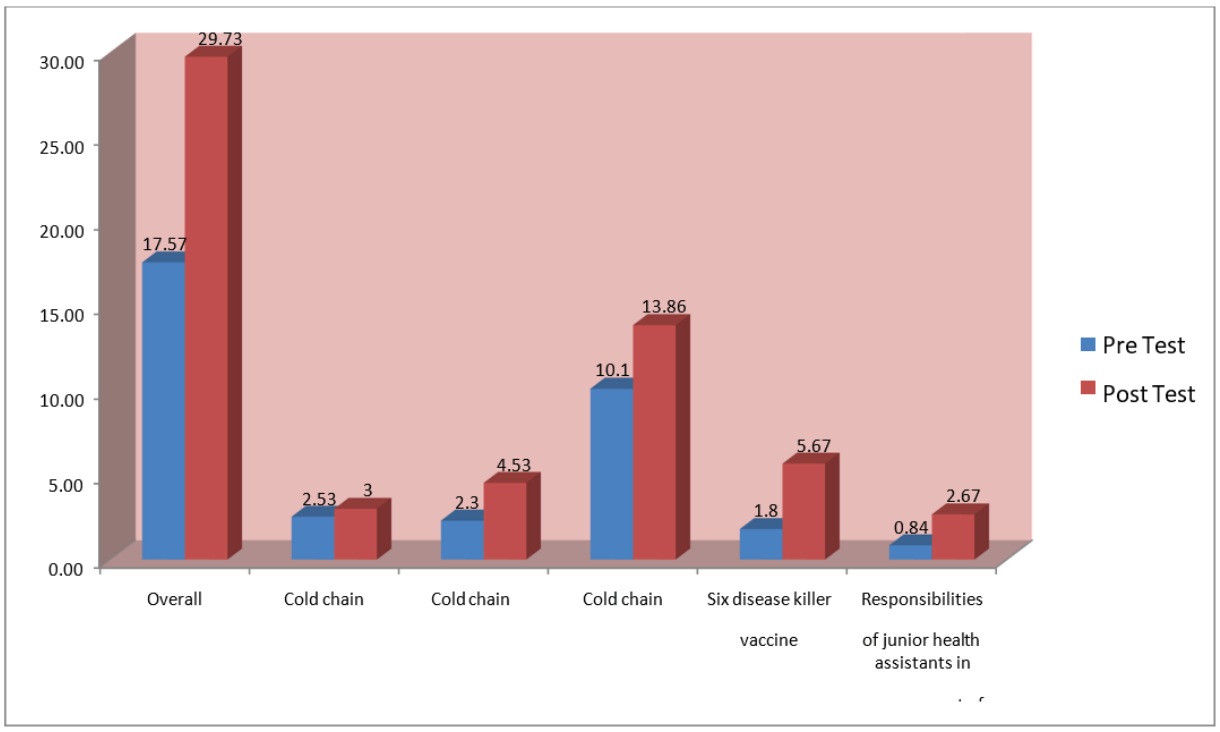

Fig No: 2 Mean of Pre Test and Post Test Knowledge scores of specific areas related to cold chain

Section-III: This section deals with the comparison of pre test and post test knowledge scores for assessing the effectiveness of Structured Teaching Programme on cold chain by using paired't' test.

Table 5: Comparison of knowledge scores of Junior Health Assistant (Female) Students before and after Structured Teaching Programme related to cold chain. (N = 30)

Specific areas related to cold chain	Mean difference	Standard error of difference	Paired 't' test
Overall knowledge	12.17	1.181	10.29
Cold chain	0.47	0.104	4.47
Cold chain system	2.23	0.196	11.40
Cold chain equipments	3.77	0.546	6.89
Six killer disease vaccine	3.87	0.491	7.88
Responsibilities of junior health assistants in management of cold chain	1.83	0.186	9.84

(Table value of't' for 29 df at 0.05 level of significance is 2.045)

Table 5 summarizes the comparison of pre test and post test knowledge scores of Junior Health Assistant (Female) Students related to cold chain.

The Mean difference in the scores related to cold chain was 0.47 (SE D=0.104) with paired't' value 4.47. Regarding cold chain system the Mean difference was 2.23 (SE D=0.196) with paired 't'value 11.40. The Mean difference scores for cold chain equipment was 3.77 (SE D=0.546) with paired't' value 6.89. Regarding six disease killer vaccine the Mean difference score was 3.87 (SE D=0.491) with paired't' value 7.88. Regarding responsibilities of junior health assistants in management of cold chain the Mean difference score was 1.83 (SED= 0.186) with paired't' value 9.84.

The Overall Mean difference was 12.17 (SE D=1.181) with paired't' value of 10.29. Thus, it was revealed that the post test mean score was significantly higher than the pre test mean score. The Table value of paired't' test at 29 degrees of freedom and at 0.05 level of significance was 2.045. Since the calculated value was higher than the table value, the research hypothesis H1 was accepted. Hence, there was a significant difference between the pre test and post test knowledge scores of the junior health assistant (female) students related to cold chain.

Section IV: This section includes association between post-test knowledge scores of Junior Health Assistant (Female) Students related to cold chain with their Demographic variables by using "Chi-square".

Table 6: Association between demographic variables of Junior Health Assistant (Female) Students with their post-test knowledge scores. (N = 30)

Sl.No.	Variable	Chi-square (χ2)value	Association	df	Chi-square (χ2)table value at 5% level
1.	Age	2.42	NS	4	9.49
2.	Basic Educational Qualification	0.67	NS	2	5.99
3.	Religion	0.79	NS	4	9.49
4.	Previous experience	7.5	S	2	5.99
5.	Sources of Information	56.8	S	10	18.31

Note: N.S. Denotes not significant, S denotes significant at 5% level of significant.

The Chi-square (c2) values computed for post-test knowledge scores on cold chain with Age (c2=7.76), Basic Educational Qualification (c2=0.67) and Religion (c2=0.79) are found to be less than the table value. But where are in demographical variables like previous experience (c2=7.5) and Sources of Information (c2=56.8) are found to be more than the table values at 5% level of significance which implies that there is significant relationship between post-test knowledge scores of Junior Health Assistant (Female) Students with regard to cold chain with their Demographic variables are previous experience and source of information. Hence the research hypothesis H2 was accepted.

Discussion

The cold chain refers to the people, equipments, and procedure designed to maintain appropriate temperature for vaccines from the time they leave the manufacturer through transportation and storage until the point of use linked with information about dispatch time and reaching time of vaccines. Health workers are responsible to maintain the temperature of vaccines at peripheral level. If vaccines are exposed to too much heat, cold, it can be damaged and lose its potency. If that happens all the effort to give the vaccines to the child is lost.10So Junior health Assistant (Female) workers being in continuous interaction with the community, holds maximum responsibility in correct maintenance of cold chain.Hence the investigator has undertaken an innovative strategy to assess the effectiveness of Structured Teaching Programme on knowledge regarding cold chain among Junior Health Assistant (Female) Students.

Effectiveness of Structured Teaching Programme on Cold chain among Junior Health Assistant (Female) Students.

The calculated mean difference in the present study was 12.17 with paired't' value of 10.29. Table value of paired't' test at 0.05 level of significance and 29 degrees of freedom was 2.045. Since the calculated value was higher than the table value, the research hypothesis H1 was accepted. Hence, there was a significant difference between the pretest and the post test knowledge scores of the Junior health assistant(Female) students related to cold chain and the Structured Teaching Programme was effective in improving the knowledge of Junior Health Assistant (Female) Students regarding cold chain.

The study results were supported by a similar study conducted in Bangladesh among 80 health professionals. The findings showed that mean knowledge score of the health professionals was increased from 19.8 to 33.7 after implementation of Structured Teaching Programme.

Conclusion

The following conclusions were drawn from the findings of present study.

1. In pre test, among 30 Junior Health Assistant (Female) Students majority of the participants (18 i.e. 60.00%) had average knowledge and 12 participants (40.00%) had low knowledge where as in post test, 23 participants (76.67%) had high knowledge followed by 6 participants (20.00%) with average knowledge and 1 participant (3.33%) had low knowledge.
2. The obtained paired't' value was 10.29, which represented that the Structured Teaching Programme on cold chain was effective in improving the knowledge of respondents in post test and it revealed that the post test mean score was higher than pre test mean score.
3. The post test knowledge score of Junior Health Assistant (Female) Students regarding cold chain with selected

demographic variables and the Chi-square (c2) values computed for post-test knowledge scores on cold chain with Age (c2=7.76), Basic Educational Qualification (c2=0.67) and Religion (c2=0.79) are found to be less than the table value. But where are in demographical variables like previous experience (c2=7.5) and Sources of Information (c2=56.8) are found to be more than the table values at 5% level of significance which implies that there is significant relationship between post-test knowledge scores of Junior Health Assistant (Female) Students with regard to cold chain with their Demographic variables previous experience and source of information. Hence the research hypothesis H2 was accepted.

Implications and Recommendations Implications: The present study has following implications for, Nursing service, Nursing administration, Nursing education and Nursing research.

Nursing Service: The nursing care provided to the client not only focuses on the present problems but also equal importance is given for prevention of potential problems. Being the backbone of health care team, nurses owe a great responsibility in educating the people.

Nursing Administration: Being at the top levels, nursing administrators owe the responsibility of not only handling the nurses for proper work but also to improve the quality of nursing by increasing their knowledge and skills.

Nursing Education: The finding of the study indicates that more emphasis needs to be placed in the curriculum on cold chain which is maintained with new technologies. Nurse educator can train the nursing students to gain in depth knowledge regarding cold chain.

Nursing Research: The nursing profession is increasingly in the development of scientific knowledge relating to its practice. Research becoming a major force in nursing and is being used to change practice, education and policy.

Recommendation

- A similar study can be undertaken on a large scale for making a more valid generalization.
- A similar study can be undertaken in other areas of Raichur.
- A similar study can be conducted to find the attitude of Junior Health Assistant (Female) Students about cold chain.
- A similar study can be undertaken using other educational strategies on cold chain of vaccines among general public.
- A descriptive study can be conducted among the student nurses.

Ethical clearance: obtained from concerned authority

Conflict of interest: None

Funding: Self

Acknowledgement: I would like to thank my parents, all my dearest faculties/staffs specially my guide and my friends for their complete support. I extend my sincere thanks to Prof Vijayreddy sir for encouragement and support.

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