

Research Article

To assess the effectiveness of structured teaching programme by on pre and post test knowledge regarding prevention of chikungunya among adults (40-50 years) in selected rural areas

Pooja Nikam

Principal, Vision nursing School, Buldana, Maharashtra, India

Abstract

Aim: The aim of this study is to assess the pre test knowledge score regarding prevention of chikungunya among the adults and to assess the post test knowledge score regarding prevention of chikungunya among the adults. **Methods:** A quasi experimental design, pre and post test without control group was used for the present study to determine the effectiveness of structured teaching programme on knowledge regarding prevention of chikungunya among the adults (40-50 years) of selected rural areas of Maharashtra. The sample for the study consists of 60 adults (male & female) age group between 40-50 years in selected rural areas, Maharashtra. **Results:** Demographic variables such as education, drainage system and source of information were having significant association and demographic variables such as age, gender, religion, and occupation were not having significant association with pre test knowledge score. Highly significant difference found between the pre-test and post-test knowledge Scores at the level of ($P < 0.05$). Majority of subject pre test having 31 (52%) poor knowledge score, 29 (48%) were average knowledge and 0 (0%) were good knowledge. Majority of subject post test having 38 (63.33%) average knowledge score, 17 (28.33%) were having good knowledge and 5 (8%) were having poor knowledge. **Conclusion:** The comparative study of about knowledge pre and post test teaching is finding suitable. The study reveals the positive outcome the importance of structured teaching programme and noted that the significant difference between knowledge regarding prevention of chikungunya among the adults (40-50 years) of selected rural areas of Maharashtra in pre and post test.

Keyword: Chikungunya, quasi experimental design, demographic variables, rural area, prevention.

*Corresponding author: Ms. Pooja Nikam, Principal, Vision nursing School, Buldana, Maharashtra, India. Email: nikam19pooja11@gmail.com

1. Introduction

Health is a common theme in most culture or community in fact all the community has their concept of health. Health is a fundamental human right and a worldwide social goal that the health is essential to be satisfaction of basic human needs and to improve the quality of life. Health is a quality of life resulting from total functioning of the individual that empower him to achieve personal and social satisfaction [1].

Communicable disease is the first health problem of the country. The communicable disease are transmitted through water, air, vector etc. among these vector borne disease are one which are transmitted by insects. The vector may be mechanical or biological. The biological vectors which usually harbours pathogens

within their body and deliver pathogens to new host, is often responsible for serious blood borne disease such as "Chikungunya" [2].

Mosquitoes are the non-arthropod flies and the member of nematocera flies. Over 3,500 species of mosquitoes have identified from various part of the world. [3].

The name Chikungunya derived from the root verb in the Makonde language means "that which bend up" or the stooped appearance of sufferer with arthralgia [4].

Chikungunya fever is primarily transmitted by *Aedes aegypti* and *Aedes albopictus* or 'The Asia tiger mosquito' by a human-mosquito-human transmission cycle. Reservoir of Chikungunya virus is the human during epidemics period and monkeys, rodents, birds and other during the inter-epidemic period [5].

The disease agent belongs to family of *Togaviridae* and Genus is *Alphavirus*. Its Virion morphology and size is

enveloped, icosahedral nucleocapsid symmetry, spherical particle, 60-70 nm in diameter, with linear, positive-sense nucleic acid and single-stranded RNA, ~11.8 kb in length [6].

The present study emphasizes the continuous sero-epidemiological surveillance for the effective arboviruses mainly dengue, chikungunya and Japanese B encephalitis control programme. The serological study indicated that all the three arthropod-borne viruses studied were prevalent in and around Bellary district, although the prevalence differed according to age, sex, geographic location and the individual virus [7].

A cross sectional study assessed the magnitude of the outbreak and identified the possible socio-environmental factors which are responsible for Chikungunya fever at Kasegaon by a team from the Krishna Institute of Medical Sciences, Karad, Maharashtra, in collaboration with the Primary Health Centre, Kasegaon, Dist. Sangli. Total population of 1599 from 388 houses which were surveyed in the village, there were 154 clinically suspected Chikungunya fever cases. Of these, 54.5% were males and 45.5% were females. About 72.7% of the cases were in the age range of 11-50 years, which is the active age group. The main symptoms were an acute onset of fever with joint pain (100%). Multiple joints were involved in (89.6%) cases [8].

A prospective multi-centric study examined to evaluate clinical, epidemiological and virological features of chikungunya infection in patients with acute febrile illness from various geographical regions of India on 540 patients with fever of up to 7 days duration were enrolled at Karnataka Institute of Medical Sciences (KIMS), Karnataka (South); Sawai Man Singh Medical College (SMS) Rajasthan (West), and All India Institute of Medical Sciences (AIIMS) New Delhi (North) from June 2008 to May 2009. Serum specimens were screened for chikungunya infection concurrently through RT-PCR and serology (IgM). This study concluded and documented re-emergence of chikungunya in high frequencies and severe morbidity in south and west India but rare in north. The study emphasizes the need for continuous surveillance for disease burden using multiple diagnostic tests and also warrants the need for an appropriate molecular diagnostic for early detection of chikungunya virus [9]. A cross-sectional survey was conducted in Dakshina Kannada district of Karnataka state to estimate the magnitude of the epidemic and the proportion of chikungunya virus (CHIKV) infections that remained clinically inapparent. The period of January to September 2008 by month of reporting was obtained from the records of PHC for number of suspected cases of CHIK. Sample population of 1,174 living in 300 households drawn from all the four subcenter areas (75 households in each subcenter area) of the PHC. The first house to be surveyed in each subcenter area was selected at random from the sampling frame and then, every 10th house

was included in the sample. The increasing trend in the seropositivity and attack rate of CHIKV infection with age group was statistically significant. The present study indicated the magnitude of the ongoing outbreak of CHIKV infection in India that started during 2005–2006 [10].

A retrospective study conducted on clinico-epidemiological study of chikungunya outbreak in Maharashtra state, India during the period April to June 2007 by paying house visits. Out of 6467 sera of suspected patients sent to National Institute of Virology, Pune, 804 were serologically confirmed. This study was carried out by interrogating all those patients for their sickness experience. Adult females from rural area were more affected than males. In 68.2% families, there were multiple cases. After health education during outbreak, there was positive improvement in behaviour pertaining to source reduction of vector. Inter-personal communication was best remembered. In health education, the role of paramedical workers and government doctors was prominent [11].

A study analysed on chikungunya outbreak in India in five States viz. Delhi, Madhya Pradesh, Orissa, Maharashtra and Kerala was conducted in 2007-2008 to know the distribution and determinants of chikungunya fever outbreak in India. On the basis of high and low incidence of chikungunya fever, two districts from each State and two wards from the selected district were taken for random selection of 1000 households from 10 districts and 5 States. Semi-structured questionnaires were administered to individuals, patients, and qualified health professionals and to stakeholders for collecting information. Education and occupation did not have any relation with emptying/drying of water containers in high incidence wards. Strengthening of surveillance, information, education and communication (IEC) activities along with case management facilities may be provided by the State health department for prevention of chikungunya outbreaks in future. Stakeholders should be more involved in outbreak management and future planning [12].

A study examined in four of the worst affected districts viz. Pathanamthitta, Idukki, Kottayam and Thrissur were during May 2007 to understand the magnitude of the problem of chikungunya fever, particularly clinical signs and symptoms. Total of 1265 persons from 310 houses were surveyed door-to-door in 20 different localities representing four affected districts. The history and examination findings from 354 clinically diagnosed chikungunya cases were recorded. The study concluded that chikungunya invaded Kerala State for the first time in 2006 and continues to be a major vector borne disease in the State [13].

A descriptive study with a total of 405 suspected cases of chikungunya fever was conducted during the epidemic period of July to September 2006 in both indoor and outdoor patients in a tertiary care hospital at

Indira Gandhi Government Medical College, Nagpur, (Maharashtra). Suspected cases of chikungunya were having clinical triad of fever, arthralgia and/or rashes were included in the study. Of the 405 samples collected, 166 were tested for serum CHIK IgM antibodies at NIV, Pune. The result shown that out of the 166 samples tested for CHIKV IgM antibodies, 87 (52.4%) were positive (confirmed cases). Male: female ratio was 2.3:1[14].

Chikungunya outbreak cases in Bhilwara district, Rajasthan during Aug-Sept 2006 on 40 samples were analysed. Fever with multiple joint pains was the first presenting feature. Aedes larval surveys indicate high breteau index, house index and container index above the critical index. Out 40 sera samples tested, 12 showed HI antibodies for Chikungunya virus in high titres [15].

A cross-sectional study conducted in the epidemic-affected Shrirampur town. Out of the total 1550 population surveyed in Shrirampur town, there were 918 (59.2%) clinically suspected chikungunya fever cases; of these 55.7% were male and 44.3% were female. The main symptoms were acute-onset fever and joint pains (100%). About 75% of the cases were in the age range of 11–50 years that is the active age-group. The majority of the cases (30.2%) were poor, belonging to social class IV of the modified Prasad's classification; 26.0% were illiterate. Apart from fever with joint pains, which was present in all cases of chikungunya fever, the other symptoms were severe headache (82.1%), arthralgia (81.0%), nausea/vomiting (62.0%), abdominal pain (34%), and a rash (14.6%) that was usually confined to the lower limbs and trunk [16].

A prospective study analysed in the island of La Reunion during March and May 2006 on 274 consecutive patients with febrile arthralgia [17].

An entomological survey study was occurred in Malegaon town of Nasik district of Maharashtra state, India during February and March 2006 to study the possible causes of the outbreak and to isolate the virus responsible. Sera samples were collected by venipuncture from clinically suspected chikungunya patients in hospitals and also during house-to-house survey in affected villages [18].

Epidemiological investigations was carried out during the decline phase revealed that all age groups and both sexes were involved with varying morbidity. The absence of previous immunity was demonstrated by a very high morbidity of 37.53 per cent for the whole town [19].

The last outbreak of Chikungunya virus infection occurred in India in 1971. Andhra Pradesh was the first state to report this disease in December 2005, and one of the worst affected over 80,000 suspected cases [20].

A study on vertical maternal foetal transmission of the Chikungunya virus, 10 cases among 84 pregnant women was carried out. In March 2005, an epidemic of Chikungunya virus began in the southern portion of

Reunion Island. The Reunion-South Hospital Group observed the first cases of pregnant women infected with the virus in June 2005. They reported here for the first time maternal-fetal transmission of this virus. From June 2005 through the end of January 2006, 84 pregnant women had acute Chikungunya infections during pregnancy [21].

An entomological survey in Moonlapamok District Champassak Province was conducted. From May to September 2012, 195 suspected chikungunya cases were reported to National Centre for Laboratory and Epidemiology and investigated been detected in the country before July 2012 by staff from the National Centre for Laboratory and Epidemiology (NCLE). This emerging disease must continue to be taken seriously, and prevention and control measures should be established or strengthened in affected areas [22].

During a recent outbreak of Dengue-like illness in eastern India, Aedes aegypti mosquitoes collected from the affected area were positive for Chikungunya virus. Evidence of dual infection with chikungunya and dengue type 1 virus was also obtained. A widely circulating low- virulent Chikungunya virus is a possible explanation for the epidemiological pattern of the Chikungunya virus disease in this region [23, 24].

Aim:

To assess the pre-test knowledge score regarding prevention of chikungunya among the adults.

To assess the post-test knowledge score regarding prevention of chikungunya among the adults.

Hypothesis

H1: There will be a significant difference between pre-test and post-test knowledge scores regarding prevention of chikungunya among adults.

Limitation:

1. The study will be limited to only adults of rural areas at Maharashtra.
2. The study will be limited to adults between 40-50 years of age.
3. The study will be limited to 60 samples at selected rural areas at Maharashtra.

2. Methods

The research methodology is a way to structure a study and to gather and analyze information in a systematic fashion [25].

Polit and Hungler stated that a research design incorporates the most important methodological decisions that a researcher makes in conducting a research study [26]. A quasi experimental design, pre

and post test without control group was used for the present study to determine the effectiveness of structured teaching programme on knowledge regarding prevention of chikungunya among the adults (40-50 years) of selected rural areas of Maharashtra. The sample for the study consists of 60 adults (male & female) age group between 40-50 years in selected rural areas, Maharashtra.

The formula used;

$$\text{Pre-test}(x) \xrightarrow{\text{Treatment STP}} \text{Post test}(y) = \text{Effectiveness} (y-x)$$

Table 1 One group pre-test post-test design

Group	Pre-test	Pre-test	Post -test
Experimental group	Structured questionnaire on Knowledge regarding prevention of chikungunya among the adults of selected rural areas	Implementation of structured teaching programme	Structured questionnaire on knowledge regarding prevention of chikungunya among the adults of selected rural areas
E	O1	V	O2

E ——— O1 ——— X ——— O2

Criteria for selection of the sample

Inclusion criteria

- Adults of 40-50 years of age group.
- Adults those who are willing to participate in the study.
- Adults who are the residents of rural area.
- Adults who are available at the time of data collection period.

Exclusion criteria

- Adults those who are not able to provide informed consent.
- Adults those who are mentally challenged.
- Adults who cannot speak, understand, read and/or write Marathi, and/or English

Selection and development of the tool

According to Compact Oxford reference Dictionary (2003), it is a device used to carry out a particular function based on the objectives of the study. After designing an experiment the statistical treatment of the problem begins. Collection of data is the first step in

the statistical treatment of a problem. The tool acts as a best instrument to assess and collect the data from the respondents of the study.

Structured questionnaire:

A knowledge questionnaire was developed for assessing the level of knowledge regarding prevention of chikungunya among adults of rural areas of Maharashtra. This tool was developed in order to attain the objectives of the study. The investigator adopted following steps in the development of the instruments:

1. Extensive review of literature
2. Opinion and suggestions were taken from experts.
3. Development of a blue print of the questionnaire
4. Construction of demographic Performa and questionnaire on prevention of chikungunya
5. Development of structured teaching programme on prevention of chikungunya among adults of rural areas of Maharashtra.
6. Content validity
7. Pre-testing the instruments.
8. Reliability

Preparation of the blueprint

The blue print of items pertaining to the domain of knowledge was prepared as per the objectives and conceptual framework. The blueprint included general concept about chikungunya and its prevention. The blue print was prepared to construct the tool. There were 30 structured questionnaires on prevention of chikungunya shown in the annexure.

Description of the tool

The tool consists of two sections.

Section- A

Socio-demographic data on different variables such as age group, gender, religion, education, occupation, drainage system, and source of information about Chikungunya.

Section-B

1. It consists of 30 items knowledge regarding prevention of chikungunya among adults of rural areas of Maharashtra. Each item has four options with one most appropriate answer. The maximum score for the correct response to each item was one and for the wrong answer the score is zero. Thus for 30 items, the maximum obtainable score was 30. Area of knowledge score were:

2. Related to meaning, causes, and mode of transmission of Chikungunya
3. Related to signs, symptoms, and diagnosis of Chikungunya related to complications, prevention and treatment of Chikungunya

3. Result

Organization of the data

The collected data is tabulated, analyzed, organized and presented under the following headings:

Section I: Frequency and percentage distribution of subjects with regards to demographic variables.

Section II: Assessment of pre test knowledge score regarding prevention of chikungunya among adults at selected rural areas.

Section III: Assessment of post test knowledge score regarding prevention of chikungunya among adults at selected rural areas.

Section- I

Frequency and percentage distribution of subjects with regards to demographic variables

N=60

This section deals with percentagewise distribution of subjects according to their demographic variables. Simple randomised sample of 60 subjects were drawn from the study population, who were adults (40 - 50 years) in selected rural areas. The data obtained to describe the sample characteristics including age, gender, religion, education, occupation, drainage system, source of information about Chikungunya.

Table 2 shows the frequency and percentage distribution of socio demographic variables such as age, gender, religion, education, occupation, drainage system and any source of information on chikungunya. Regarding age of adults shows that majority 34 (57%) belongs to the age group of 40-45 years, 26 (43%) belongs to the age group of 46-50 years. Regarding gender majority of adults 46 (77.0%) were male and the rest 14 (23.0%) were females. Regarding religion 39 (65%) belongs to Hindu religion, 8 (13%) belongs to Muslim, 13 (22%) belongs to other. Regarding education 4 (7 %) have no formal education, 17 (28 %) belong to primary educational group, 30 (50%) belongs to secondary educational group, 9 (15%) belongs to graduate.

Regarding occupation 40 (67%) have service, 9 (15%) have business, 11 (18%) were housewives.

Regarding drainage system 35 (58%) have open drainage system and 25 (42%) have close drainage system.

Table 2 Description of samples according to their demographic characteristics

SN	Chart	Category	Frequency	%
1	Age	40-45 yrs	34	57
		46-50 yrs	26	43
2	Gender	Male	46	77
		Female	14	23
3	Religion	Hindu	39	65
		Muslim	8	13
		Christian	0	0
		Any Other	13	22
4	Education	No formal education	4	7
		Primary School	17	28
		Secondary Education	30	50
		Graduate	9	15
5	Occupation	Service	40	67
		Business	9	15
		House wife	11	18
6	Drainage system	Open	35	58
		Closed	25	42
7	Any source of information	Television	27	45
		School Teacher	2	3
		Relatives	12	20
		Health Personnel	9	15
		None	10	17

Regarding source of information 27 (45%) were having information from television / Radio / News Paper / magazines, 2 (3%) having information from school teacher, 12 (20%) having information from relatives, 9 (15%) having information from health personnel, 10 (17%) were not having any source of information.



Fig 1 Frequency wise and percentage wise distribution of subjects according to their age. (Yrs)

The cylindrical Fig 1 shows percentage wise distribution of adults (40-50 years) according to their age. Figure depicts that adults of selected rural areas 34 (57%) belongs to the age group of 40-45 years, 26 (43 %) belongs to the age group of 46-50 years.

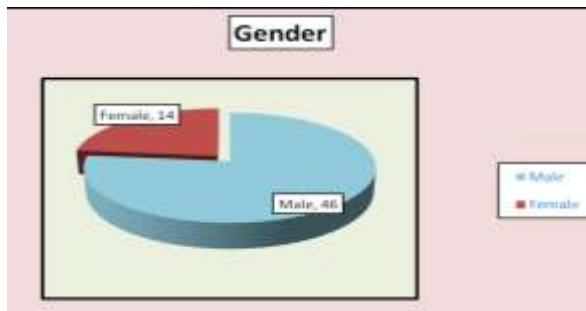


Fig 2 Frequency wise and percentage wise distribution of subjects according to the gender

The Fig 2 shows percentage wise distribution of adults according to gender figure depicts that in gender majority of adults 46 (77.0%) were male and the rest 14 (23.0%) were females.

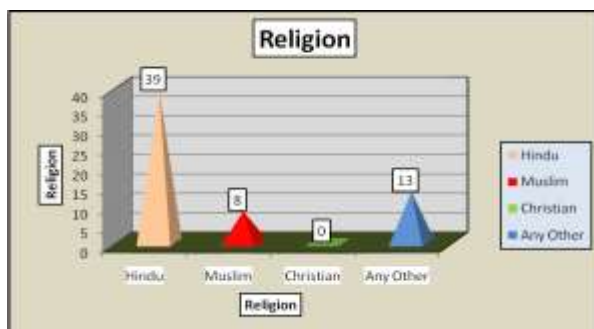


Fig 3 Frequency wise and percentage wise distribution of subjects according to their religion

The cone diagram shows percentage wise distribution of adults according to religion. Figure depicts that adults of selected rural areas 39 (65%) belongs to Hindu religion, 8 (13%) belongs to Muslim, 13 (22%) belongs to other shown in Fig 3.

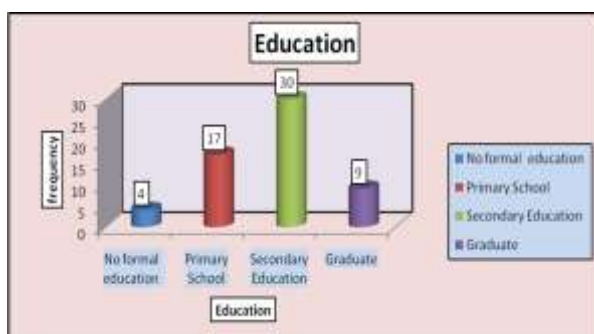


Fig 4 Frequency wise and percentage wise distribution of subjects according to their educational level.

The cylindrical diagram shows percentage wise distribution of adults according to their educational level. Figure depicts that adults of selected rural areas 4 (7%) have no formal education, 17 (28%) belong to primary educational group, 30 (50%) belongs to secondary educational group, 9 (15%) belongs to graduate shown in Fig 4.

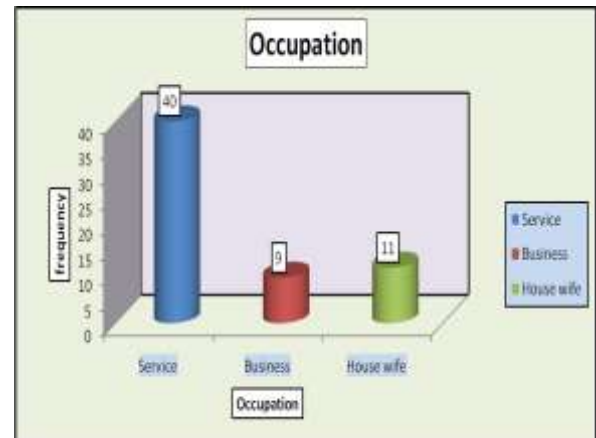


Fig 5 Frequency wise and percentage wise distribution of subjects according to their occupation.

The cylindrical diagram shows percentage wise distribution of adults according to their occupation figure depicts that adults of selected rural areas-40 (67%) have service, 9 (15%) have business, 11 (18%) were Housewives shown in Fig 5.

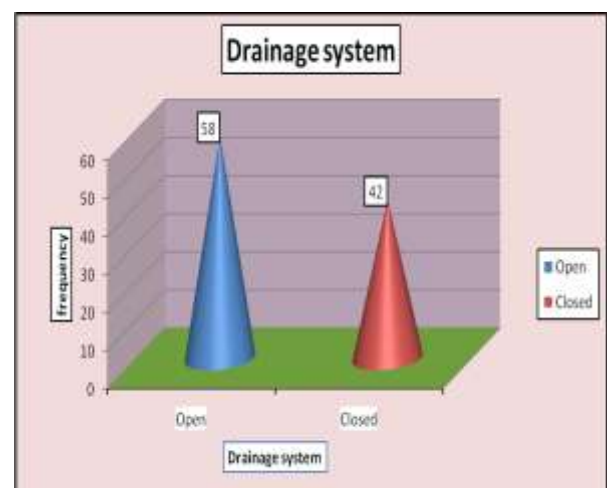


Fig 6 Frequency wise and percentage wise distribution of subjects according to their drainage system.

The cone diagram shows percentage wise distribution of adults according to their type of drainage system. Figure depicts that adults of selected rural areas- 35 (58%) have open drainage system and 25 (45%) have close drainage system shown in Fig 6.

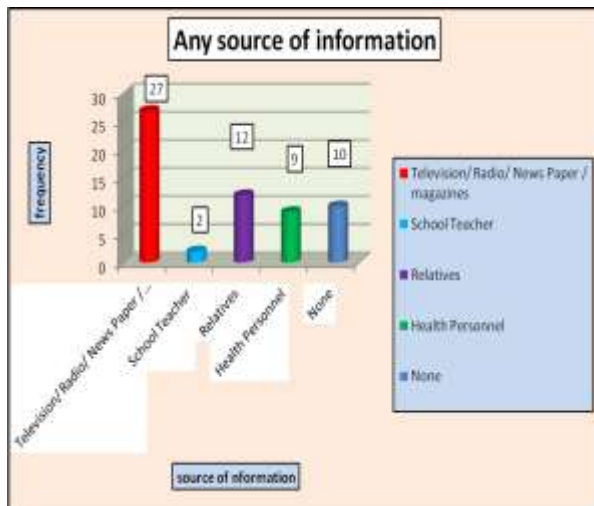


Fig 7 Frequency wise and percentage wise distribution of subjects according to their source of information regarding chikungunya.

The cylindrical diagram shows percentage wise distribution of adults according to their source of information. Figure depicts that adults of selected rural areas-27 (45%) were having information from television/ Radio/ News Paper / magazines, 2 (3%) having information from school teacher, 12 (20%) having information from relatives, 9 (15%) having information from health personnel, 10 (17%) were not having any source of information shown in Fig 7.

Section-II

Assessment of knowledge regarding prevention of chikungunya among adults at selected rural areas. Knowledge of 60 adults (40-50 years) was assessed using a structured questionnaire analyzed using descriptive statistics.

Table 3 General assessment with pre-test

SN	Level of pre test knowledge regarding prevention of chikungunya	Score	Frequency	%
1	Poor	0-10	31	52
2	Average	11-20	29	48
3	Good	21-30	0	0
	Total		60	100

Data in Table 3 shows before giving structured teaching programme (pre-test), majority 31 (52%) of the subject had poor knowledge regarding prevention

of chikungunya, 29 (48%) had average knowledge and 0 (0.0%) had good knowledge regarding prevention of chikungunya.

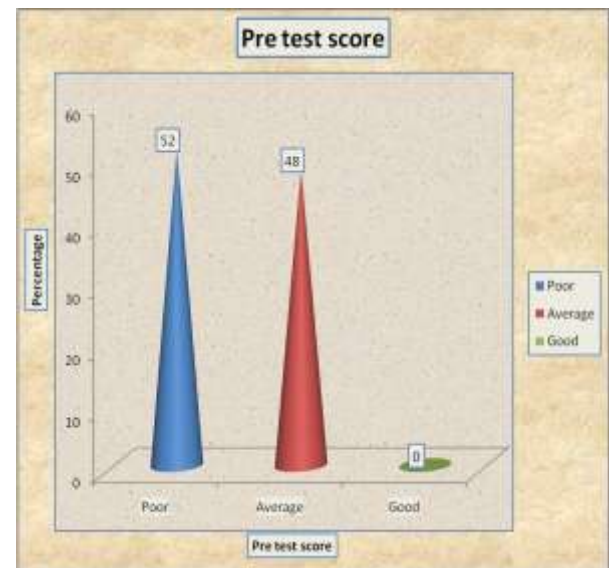


Figure 8 Showing Pre Test Score

Section III

Assessment of post test knowledge scores of adults (40-50 years) regarding prevention of chikungunya by using frequency and percentage of post test knowledge scores.

Table 4 General assessment with post-test

SN	Level of post test knowledge regarding prevention of chikungunya	Score	Frequency (N)	%
1	Poor	0-10	5	8.33
2	Average	11-20	38	63.33
3	Good	21-30	17	28.33
	Total		60	100

Data in Table 4 shows after giving structured teaching programme (post test), only 5 (8.33%) had poor knowledge regarding prevention of chikungunya, 38 (63.33%) had average knowledge and 17 (28.33%) of the subject had good knowledge regarding prevention of chikungunya. In the post-test there was marked improvement in the knowledge of the subject with majority (63.33%) gained average knowledge regarding prevention of chikungunya.

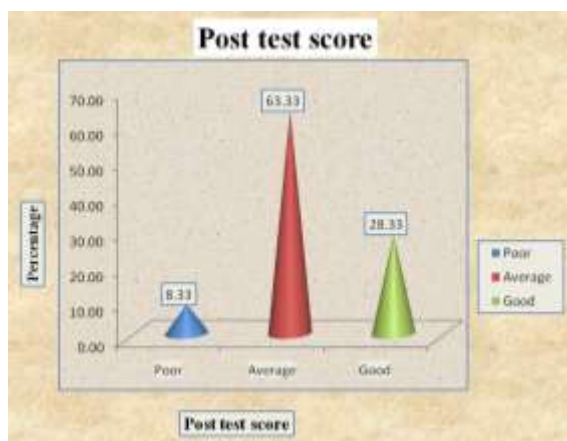


Fig 9 Showing Post-test Score

4. Discussion

The findings of the study have been discussed with reference to the objectives and hypotheses along with findings of other studies.

Section I: It shows demographic characteristics of subjects as follows:

1. Majority 34 (57%) of the subjects were in age group of 40- 45years.
2. Majority 46 (77%) of the subjects were males.
3. Majority 39 (65%) of the subjects were Hindu.
4. Majority 30 (50%) of the subjects have secondary education.
5. Majority 40 (67%) of the subjects have service.
6. Majority 35 (58%) of the subjects have open drainage system.
7. Majority 27 (45%) of the subjects having information from television / Radio / News Paper / magazines

Section II: Distribution of samples according to their pre test level of knowledge regarding prevention of chikungunya among the adults (40-50 years) of selected rural areas.

- Analysis of the pre test knowledge scores of the adults (40-50 years) revealed that in the pre-test out of 60 adults (40-50 years) majority of them 31 (52%) had poor knowledge score, 29 (48%) had average knowledge and 0 (0%) had good knowledge.

Section III: Distribution of samples according to their post-test level of knowledge regarding prevention of chikungunya among the adults (40-50 years) of selected rural areas.

- Analysis of the post-test knowledge scores of the adults (40-50 years) revealed that in the post test out of 60 adults (40-50 years) majority of them 38

(63.33%) had average knowledge score, 17(28.33%) had good knowledge and 5 (8%) had poor knowledge.

Summary

The present study was conducted with the purpose to evaluate the effectiveness of structured teaching programme on knowledge regarding prevention of chikungunya among the adults (40-50 years) in selected rural areas at Maharashtra. In order to achieve the objective of the study, a quasi experimental one group pre-test post test without control group design with evaluative approach was adopted and for that simple random sampling technique (lottery method) was used to select the subject for the study. The data were collected by using structured questionnaire from 60 adults (40-50 years) before and after the administration of structured teaching programme on knowledge regarding prevention of chikungunya among the adults (40-50 years) in selected rural areas at Maharashtra.

Conclusion

One of the factors contributing to chikungunya is carelessness lack of knowledge regarding its prevention.

The findings of the present study showed that, the post-test knowledge score was higher than the pre-test knowledge score range. The mean post-test knowledge score (17.38) also was higher than the mean pre-test knowledge score (10.28).

The study findings concluded that adults (40-50 years) had poor knowledge regarding prevention of chikungunya. The structured teaching program had great potential for accelerating the awareness regarding prevention of chikungunya.

Reference

- [1] K. PARK. Textbook of prevention and social medicine. 19th ed.: Bhanot Publication; 2007.
- [2] Sundarrao K., "Introduction To Community Health Nursing". 4th ed.: B.I. Publications, Pvt. Ltd; 2004.
- [3] Symptoms, Diagnosis, and Treatment, Centre for disease control and prevention, CDC 24/7.
- [4] Alphaviruses. *In*: Fields Virology Third Edition; volume 1; Fields BN, Knipe DM, Howley PM, editors. Lippincott-Raven Publishers: Philadelphia; 1996. p. 858-98
- [5] Scot C Weaver, et al., Chikungunya virus and prospects for a vaccine, Expert Rev Vaccines. 2012 Sep; 11(9): 1087-1101. doi: 10.1586/erv.12.84
- [6] 22. Guidelines on Clinical Management of Chikungunya Fever, World Health Organization,

- Regional office for south-east Asia, New Delhi. October -2008.
- [7] Narayan S. The Prevalence of Arboviral diseases mainly Dengue, Chikungunya and Japanese B Encephalitis in and around Bellary d. *Journal of Pharmaceutical and Biomedical Sciences.*; 15(15).
 - [8] Patil SS. study of the outbreak of Chikungunya fever. *Journal of Clinical and Diagnostic Research.* 2013 June; 7((6): 1059-1062).
 - [9] Ray, P., Ratagiri, V. H., Kabra, S. K., Lodha, R., Sharma, S., Sharma, B. S. & Wig, N. (2012). Chikungunya infection in India: results of a prospective hospital based multi-centric study. *PLOS One*, 7(2), e30025.
 - [10] Manimunda, S. P., Sugunan, A. P., Rai, S. K., Vijayachari, P., Shriram, A. N., Sharma, S., ... & Sudeep, A. B. (2010). Outbreak of chikungunya fever, Dakshina Kannada District, South India, 2008. *The American journal of tropical medicine and hygiene*, 83(4), 751-754.
 - [11] Doke, P. P., Dakhure, D. S., & Patil, A. V. (2011). A clinico-epidemiological study of Chikungunya outbreak in Maharashtra State, India. *Indian journal of public health*, 55(4), 313.
 - [12] Nagpal, B. N., Saxena, R., Srivastava, A., Singh, N., Ghosh, S. K., Sharma, S. K. & Ojha, V. P. (2012). Retrospective study of chikungunya outbreak in urban areas of India. *Indian Journal of Medical Research*, 135(3), 351.
 - [13] Kannan M. a study on chikungunya outbreak during 2007 in kerala, south India. *Indian Journal Medical Reseach.* 2009 March; 129(311-315).
 - [14] Suryawanshi, S. D., Dube, A. H., Khadse, R. K., Jalgaonkar, S. V., Sathe, P. S., Zawar, S. D., & Holay, M. P. (2009). Clinical profile of chikungunya fever in patients in a tertiary care centre in Maharashtra, India. 129(438-441.).
 - [15] Jain, S. K., Kumar, K., Bhattacharya, D., Venkatesh, S., Jain, D. C., & Lal, S. (2007). Chikungunya viral disease in district Bhilwara (Rajasthan) India. *The Journal of communicable diseases*, 39(1), 25-31.
 - [16] Ahmad, N. (2009). Chikungunya fever-epidemic in rural Maharashtra. *Indian Journal of Community Medicine*, 34(4), 372.
 - [17] Staikowsky, F., Talarmin, F., Grivard, P., Souab, A., Schuffenecker, I., Le Roux, K., & Michault, A. (2009). Prospective study of Chikungunya virus acute infection in the Island of La Reunion during the 2005–2006 outbreaks. *PloS one*, 4(10), e7603.
 - [18] Kumar KC., et al., Investigation of an outbreak of chikungunya in Malegaon Municipal areas of Nasik district, Maharashtra (India) and its control. *J Vector Borne Dis.* 2008 Sep; 45;(3):1).
 - [19] Padbidri VS GT. Epidemiological investigations of chikungunya epidemic at Barsi, Maharashtra state, India. *J Hyg Epidemiol Microbiol Immunol.* 1979; 23 (: 445-51).
 - [20] Ravi, V. (2006). Re-emergence of chikungunya virus in India. *Indian journal of medical microbiology*, 24(2), 83.
 - [21] PY R. I Vertical maternal fetal transmission of the chikungunya virus. Ten cases among 84 pregnant women. 2006 May; 35((5 Pt 1):785-8.).
 - [22] Phimmasine, S., Khamphaphongphane, B., Kitthiphong, V., & Lewis, H. C. (2013). Emergence of chikungunya in Moonlapamok and Khong Districts, Champassak Province, the Lao People's Democratic Republic, May to September 2012. *EDITORIAL TEAM*, 4(1), 46.
 - [23] DT M. Isolation of chikungunya virus from Aedes aegypti mosquitoes collected in the town of Yawat, Pune district, Maharashtra State, India. 2001; 45((5-6):305-9.).
 - [24] Hundekar, S. L., Thakare, J. P., Gokhale, M. D., & Barde, S. V. (2002). Development of monoclonal antibody based antigen capture ELISA to detect chikungunya virus antigen in mosquitoes. *Indian Journal of Medical Research*, 115, 144.
 - [25] Polit DF BC. Essential of nursing research. 7th ed.: Lippincott publication; 2009.
 - [26] Hungler PA. "Nursing research principles and methods. 5th ed.: Lippincott Company; 1999.