ROLE OF PHARMACIST IN IMPROVING THE KNOWLEDGE AND PREVENTION PRACTICES OF DENGUE AMONG SELECTED RURAL HIGH SCHOOL CHILDREN OF GUNTUR DISTRICT

P. Lakshmi Kumari*[1], K. Raja Mohan Reddy[1], K.V. Sahithi[1], V. Lokesh Reddy[2], A.M.S. Sudhakar babu[3]

[1*]Pharm.D - Department of Pharmacy Practice, A. M. Reddy Memorial College of Pharmacy, Narasaraopet, Guntur, A. P, India.
[2]Department of Pharmacy Practice, A. M. Reddy Memorial College of Pharmacy, Narasaraopet, Guntur, A. P, India.
[3]Department of Pharmaceutics, A. M. Reddy Memorial College of Pharmacy, Narasaraopet, Guntur, A. P, India.

ABSTRACT
The Study entitled "Assessment of Knowledge and Role of Pharmacist in Improving the Knowledge and Prevention Practices of Dengue among Selected Rural High School Children of Guntur District" was designed to assess the awareness of dengue fever and also to evaluate the impact of an educational intervention carried out in this study. A suitable self-administered (KAP) Knowledge, attitude, awareness survey questionnaire was designed and validated by pilot study and the study was conducted among secondary school students of the government school. This prospective knowledge attitude practice (KAP) questionnaire study of 6 month duration included a total of 500 (100%) participants. An interactive educational intervention was designed for all participants of pre-KAP questionnaire survey. The impact of effectiveness of educational intervention among the secondary school students was evaluated by means of post-KAP questionnaire survey. The paired t-test and chi-square test was done by using SPSS software for statistical calculation. In our study a total of 500 participants responded and involved in the pre-KAP and post-KAP questionnaire survey. Participants involved in the study were 256 male and 244 female secondary school students of 8th, 9th and 10th standards. The overall response rates between pre intervention and post intervention was statistically significant ($P<0.05$) shows effectiveness of educational intervention for improving awareness of dengue fever among the participants. The study concluded that imparting the knowledge and awareness on dengue fever among the secondary school students by means of continuous educational intervention would bring up updated knowledge and preventive measures regarding dengue virus.

KEYWORDS
Dengue fever, Secondary school students and KAP questionnaire.

Author for Correspondence:
Lakshmi Kumari P,
Pharm.D - Department of Pharmacy Practice,
A. M. Reddy Memorial College of Pharmacy,
Narasaraopet, Guntur, Andhra Pradesh, India.
Email: harilakshmi.kumari@gmail.com

INTRODUCTION
Dengue fever (DF) and its potentially fatal forms - dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) - are significant public health problems in tropical and sub-tropical regions worldwide. Dengue hemorrhagic fever was first acknowledged in 1950's during the dengue

epidemics in the Philippines and Thailand. Dengue leads to considerable changes in morbidity and mortality especially in the tropics, with more than $2/5^{th}$ of the world's population living in areas at risk for Dengue. Today, severe dengue affects most common in Asian and Latin American countries and has become a foremost cause of hospitalization and death among children[1]. It was caused by the mosquito *Aides aegypti, belongs to the family Flaviviridae.* It has four antigenic collaborator distinct serotypes (DENV1, DENV-2, DENV-3 and DENV-4), all of which cause identical disease in humans. If a person is infected with one serotype that person gets life- long immunity to that particular serotype and short-term immunity to others[2]. The source of dengue is ambiguous, but the scientist has proposed that the dengue was originated in Asian forests due to an infection cycle involving between mosquito and primates[3]. Mainly this mosquito bites during sun rising and sunset times. This virus transmits to one person to the other through human-mosquito- human transmission cycle. When a person was infected with this virus he develops a condition called viremia (condition which there is a high level of virus developing in the blood) after four days. It can last from 5-12 days. The mosquito must take its blood meal from the infected person during the period of viremia where the high levels of virus in the blood by piercing the infected person[4]. Once the virus enters into the mosquito's system through midgut and subsequently to the salivary glands within 8-12 days. After this incubation period the virus transmit to the another person while feeding[5]. The person develops the symptoms after the 5th day of the mosquito bite those include primarily High grade fever, headache, muscle and joint pains, and a distinguishing skin rash that is similar to measles. In a minute proportion of cases the disease expands into the life-threatening dengue hemorrhagic fever and finally leads to dengue shock syndrome, where dangerously low blood pressure occurs and leads to death particularly infants[6]. There is no vaccine for dengue fever and no specific treatment and anti-viral agent. Vector control is the only preventive measure for dengue fever.

During 2014 the overall reported dengue cases were 40473 and the deaths were 139. In Andhra Pradesh 1262 dengue cases and 5 deaths were reported. Maharashtra has reported maximum number of cases 8573 out of this 54 deaths were reported which was the highest in 2014. In Delhi out of 995 cases 3 deaths were reported. During 2015 the total number of reported dengue cases were 3061 up to 29th April and having 8 deaths only. The maximum number of cases and deaths were reported in Tamil Nadu (1280, 5) during this year[8].

There is an insistent need to protect children against dengue because this age group is particularly very sensitive to the disease. Since these vectors are active mainly during the day time particularly at the sunrise and sunset times, a potential target for control should be schools where children spend a huge amount of time in their day[9]. Children are the reserves of a nation. Today's children are the citizen of tomorrow. Because they develop into citizen and leaders of the tomorrow. In future the development of children's depends on their enjoying good health today[10]. In rural areas spread of aedeses is related to occurrence associated with rural water supply schemes scarcity of water with consequent improper storage of water and use of disposable containers[11].

As we are considered about the formerly said facts regarding dengue fever and its effects in developing countries in India. We are motivated to take responsibility of certain awareness among public exclusively in students as a pharmacist. Therefore we consider it is as our opportunity by means of our project work to initiate the interactive programme of awareness about dengue fever in rural areas. It is in fact, inclusion of particular high school students in project reflects a reliable and swiftly communication into public. Hence we have to take up a study entitled.

"Role of pharmacist in improving the knowledge prevention practices of dengue among selected rural high school children of guntur district".

MATERIALS AND METHODOLOGY

Study design

A Prospective Knowledge Attitude Practice (KAP) Questionnaire Study.

Study site

The study was carried out among rural High school children of Guntur district. And the numbers of schools were three.

Study Period

06 Months.

Study Population and Sampling

During the study period of 06 months (November - April), there were total of 500 students involved in the study.

Study Criteria

Inclusion criteria

All Students of:

Secondary school students (8th -10th class.)

Exclusion Criteria

High school students who are not willing to participate in the study.

Study Tools and Procedure

The Self-administered assessment questionnaires were designed by using standard text books, journal, and websites and by other relevant sources and it was validated by the well experienced physicians. The questionnaires will be of objective type and consists of 20 multiple choice questions. Each question carries 2 answers among them 1 will be correct answer. Each correct answer is given a score of 1 and wrong answers a score of zero.

Questionnaire Validation

Four members of health care professionals and physicians who are experts in general medicine regarding dengue fever were asked to evaluate the clarity, relevance and conciseness of items included in the questionnaire. The observations and comments of the physicians were taken in to the account. In order to test the validity and reliability of the questionnaire. The survey form was pilot tested by administering it to sample of 20 secondary school students who did not participate in the study. The overall Cranach's alpha value was 0.706 and no modifications have been carried out.

Data Analysis

The filled KAP questionnaires were analyzed as per the study objectives. The various parameters such as sex distribution, professional status, educational qualifications, and the knowledge, attitude and practice scores were analyzed. The data obtained were entered in Microsoft excel spread sheet and were analyzed.

All results obtained were entered in Microsoft excel, and the statistical calculations were performed using SPSS software version 20.0 the level of statistical significance was set at *p<0.01* (paired t-test).

RESULTS AND DISCUSSION

During the 06 months study period, 500 (90%) high school students out of 550 participated and responded to the study in the study site (ZPH School). The study population of 500 students belongs to various standards in the ZPH Schools. Demographic details of the participants involved in the study was categorized based on gender distribution, educational qualification, the results of which were thoroughly analyzed and reported in Table No.1 (Demographic details of the participants) Figure No.1 (Gender distribution of the participants) Figure No.1, Graph No.2 (Percentage/ Gender distribution of participant based on educational qualification).

Among 500 participants, 256 (51.2%) were male and 244 (48.8%) were female, with various standards belongs to the secondary education level. Educational qualifications of the students have been observed. Out of which 157 (31.45%) [88 male (56.05%) and female 69 (43.94%)] students were 8th standard, 189 (37.08%) [89 male (47.08%) and 100 female (52.9%)] were 9th standard, 154 (30.8%) [79 male (51.2%) and 75 female (48.70%)] were 10th standard.

The response of the study was evaluated by administering a standard KAP Questionnaire to all the 500 participants, to assess their knowledge attitude and perception/practice towards dengue fever by comparative study between Pre-KAP and Post-KAP percentage of positive responses.

The report of which was entered in to Microsoft excel and statistically evaluated with help of chi-square test taking p value <0.01 as statistically significant and overall response rates between pre intervention and post intervention of student t test the p value is <0.05 as statistically significant. These statistics were done by using SPSS software version 20.0.

This educational intervention program encouraged the participants (secondary school students) to follow preventive measures regarding dengue virus in public as their future perspective. The overall results of post-KAP questionnaire in our study were encouraging among the participants and revealed that participants enhanced awareness on dengue fever (with statistically significant value) after they had received educational training program on dengue fever. In our study, one focus of educational intervention was to increase the participant's (secondary school students) awareness on dengue fever.

This was demonstrated by an increase in the positive response in pre and post-KAP Questions (1 to 20) of the standard KAP questionnaire. Evidently, the documented results of Question 1 sought information about information about awareness on dengue fever. Response rates for question 1 differ significantly (Table No.2) between pre-KAP and post-KAP i.e., after educational interventions, 92.4% to 96% respectively, and the response rate was statistically insignificant P value was 0.0148.

Question 2 required the information about acquiredness of the dengue fever. According to the data for question 2, 35.2% of participants given positive response (Table No.2) in pre-KAP, 75.2% of participants given positive response in post-KAP, the response rate was significant, the P-value obtained was <0.01.

Question 3, was 94% before the intervention and increasing to 96% after the post KAP to 100% strongly suggests that there is a great need to create awareness on dengue fever among secondary school students and it was statistically insignificant.

Question 4 and 5from Table No.2 shows that 7.2% before pre-KAP to 83% post-KAP and 10.8% before

pre-KAP to 83% post-KAP suggests that there is great need to create awareness on dengue fever through campaign.

Question 6 and 7 from Table No.2 where there was an increased positive response rate of 16.4% before to 81% after the educational intervention program as pre-KAP and post-KAP values respectively and 21% before to 82% after the intervention. The result strongly suggests educating secondary school students about the dengue virus.

The study secondarily focuses on improvising the approach on and dengue fever among the secondary school students, which was attained to the optimum best by comparing the positive responses of both pre-KAP and post-KAP values and it, was statistically significant.

Question 8 sought the information about consulting of health care professional during the dengue fever. According to the data for question 08, 44.4% of participants given positive response (Table No.2) in pre-KAP, 78.4% of participants given positive response in post-KAP, the response rate was significant, the P-value obtained was <0.01.

Question 9and 10 of Table No.2 where there was an increased positive response rate of 10% before to 92.8% after the educational intervention program as pre-KAP and post-KAP values respectively and 9.8% before to 88% after the intervention for which the comparativeness with educational intervention in between pre-KAP and post-KAP defined effective and statistically significant.

Question 11and 12 from Table No.2 shows that 21.8% before pre-KAP to 88% post-KAP and 8.4% before pre-KAP and post KAP respectively strongly suggests that there is a great need to create promotion and awareness on dengue fever among secondary students.

Question 13 sought the information about instance of mosquito bite of the dengue fever. According to the data for question 13, 4.4% of participants given positive response (Table No.2) in pre-KAP, 85.2% of participants given positive response in post-KAP, the response rate was significant, the P-value obtained was <0.01.

Question 14 from Table No.2 shows that 86.6% before pre-KAP to 90.8% post-KAP increased positive response indicates statistically insignificant.

Question 15 from Table No.2 shows that 8.2% before pre-KAP to 89.4% post-KAP and it suggests that there is a great need to conduct an awareness programme on dengue virus through campaigns by health care professionals to the (secondary school) students and it was statistically significant.

Question 16 from Table No.2 shows that there was an increased positive response value from pre-KAP to post-KAP that is 07% to 86.2% respectively and it suggests that there is a great need to conduct an awareness programmed on dengue virus through campaigns by health care professionals to the (secondary school) students.

Question 17 and 18 from Table No.2 shows that 3.2% before pre-KAP to 93% post-KAP and 6.2% before pre-KAP to 90.2% post-KAP increased positive response indicates statistically significant.

Question 19 and 20 from Table No.2 shows that 02% before pre-KAP to 92.6% post-KAP and 6.2% before pre-KAP to 91.6% post-KAP increased positive response indicates statistically significant.

Table No.1: Demographic Details of Participants

S.No	Demographic Details	No. of Participants (n = 500)		
1	Gender Distribution A. Male B. Female	256(51.2) 244(48.8%)		
2	Education Qualification	No. of students (n = 500)	Gender distribution	
			Male	Female
	8th class students	157 (31.45%)	88 (56.05%)	69 (43.94%)
	9th class students	189 (37.8%)	89 (47.08%)	100 (52.9%)
	10th class students	154 (30.8%)	79 (51.2%)	75 (48.70%)
3	Professional Status	Secondary school Students		

Table No.2: Knowledge, attitude and perception of high school children towards awareness on dengue fever Questionnaire before and after educational intervention

S.No	K A P Items	Pre – KAP responses (%) N = 500	Post – KAP responses (%) N = 500	*p- value*
1	Are you aware of dengue fever			
	Yes	462(92.4%)	480(96%)	**0.014884**
	No	38(7.6%)	20(4%)	
2	How do u come to know about dengue			
	a. Television	114(22.8%)	26(5.2%)	
	b. Internet	52(10.4%)	04(0.8%)	
	c. Newspapers	58(11.6%)	17(3.4%)	**P<0.01**
	d. School	176(35.2%)	376(75.2%)	
	e. Hospitals/Doctors	100(20%)	77(15.4%)	
3	Do you know dengue fever is caused by mosquito?			
	Yes	470(94%)	480(96%)	**0.146793**
	No	30(6%)	20(4%)	

4	Does the mosquito breeds in clean standing water?			
	Yes*	36(7.2%)	415(83%)	**P<0.01**
	No	464(92.8%)	85(17%)	
5	Does the mosquito breeds in dirty water and garbage?			
	Yes*	446(89.2%)	85(17%)	**P<0.01**
	No	54 (10.8%)	415(83%)	
6	Do you think dengue fever is common after rainfall?			
	Yes*	82 (16.4%)	405 (81%)	**P<0.01**
	No	418(83.6%)	95(19%)	
7	Does dengue causes high grade fever and severe body pains?			
	Yes*	105(21%)	410 (82%)	**P<0.01**
	No	395 (79%)	90(18%)	
8	Where will you take your family member if he/she has high grade fever and severe body pains?			
	a. Self-medication	12(2.4%)	08 (1.6%)	
	b. RMP	266 (53.2%)	100 (20%)	**P<0.01**
	c. Doctor*	222 (44.4%)	392(78.4%)	
9	Do you know severe headache, pain behind the eyes and rashes are signs of dengue fever?			
	Yes*	50 (10%)	464 (92.8%)	**P<0.01**
	No	450 (90%)	36(7.2%)	
10	Do you know what happens if perfect and complete treatment was not taken?			
	Yes *	49 (9.8%)	440(88%)	**P<0.01**
	No	451 (90.2%)	60(12%)	
11	Do you think dengue fever can be transmitted through direct contact with infected person?			
	Yes	391 (78.2%)	60 (12.0%)	**P<0.01**
	No *	109(21.8%)	440(88%)	
12	Do you know which medication you have to take primarily for high grade fever?			
	Yes *	42 (8.4%)	442 (88.4%)	**P<0.01**
	No	458 (91.6%)	58(11.6%)	
13	Do you know at what times the mosquito bites?			
	a. Sunrise and Sunset*	22 (4.4%)	426 (85.2%)	
	b. Morning	0 8(1.6%)	06 (1.2%)	**P<0.01**
	c. Afternoon	00(00%)	00 (0%)	
	d. Night	296(59.2%)	68 (13%)	
	e. anytime	174(34.8%)	00	
14	Do you know the preventive measures for dengue fever?			
	Yes *	433 (86.6%)	454(90.8%)	**0.035942**
	No	67 (13.4%)	46 (9.2%)	
15	Do you know that bleeding from nose and gums without any trauma are signs of severe dengue?			
	Yes *	41 (8.2%)	447 (89.4%)	**P<0.01**
	No	459(91.8%)	53(10.6%)	
16	Do you know that fall in temperature within 3 to 7 days after high grade fever is an alarming symptom of shock due to severe dengue?			
	Yes *	35 (07%)	431 (86.2%)	**P<0.01**
	No	465(93%)	69(13.8%)	
17	Do you know that severe abdominal pain and persistent vomiting are symptoms of severe dengue?			
	Yes *	19 (3.8%)	465 (93%)	**P<0.01**
	No	481 (96.2%)	35(07%)	
18	Do you know that severe dengue can lead to difficulty in breathing, shock and death?			

	Yes *	31 (6.2%)	451 (90.2%)	**P<0.01**
	No	469 (93.8%)	49(9.8%)	
19	Do you know that what happens if you discontinue the treatment?			
	Yes *	10 (02%)	463 (92.6%)	**P<0.01**
	No	490(98%)	37(7.4%)	
20	Do you know that what happens if over use of painkillers?			
	Yes *	31(6.2%)	458(91.6%)	**P<0.01**
	No	469(93.8%)	42(8.4%)	

The value of t is 4.376400. The result is significant at $p<0.05$.

Demographic Graphs
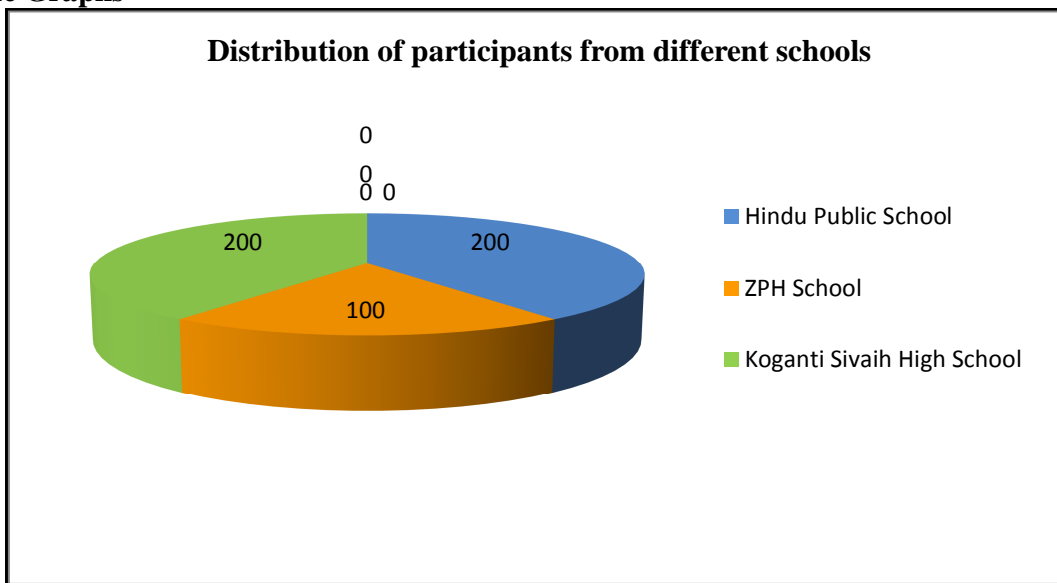
Figure No.1: Distribution of the Participants from different Schools
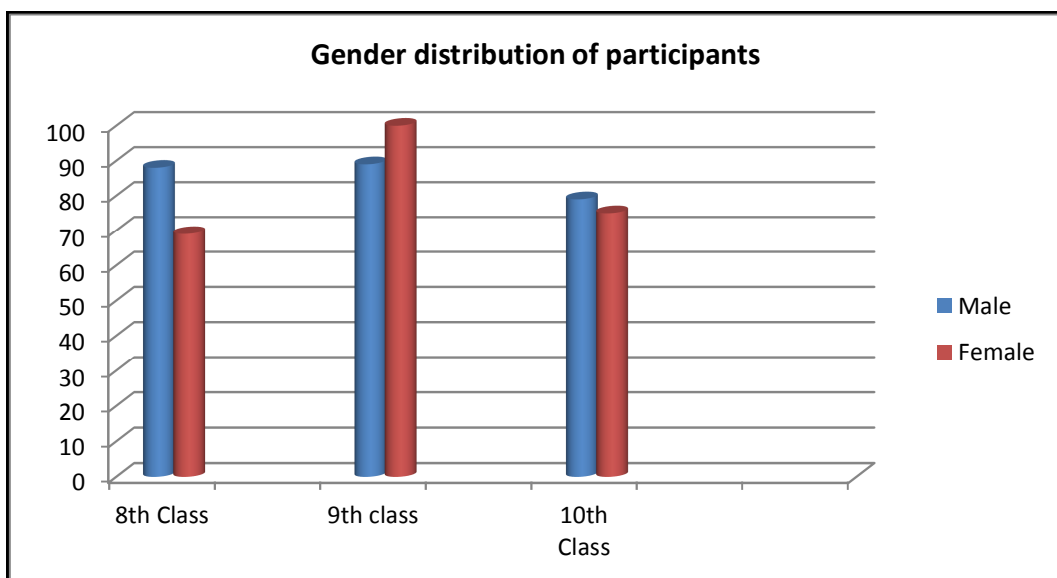
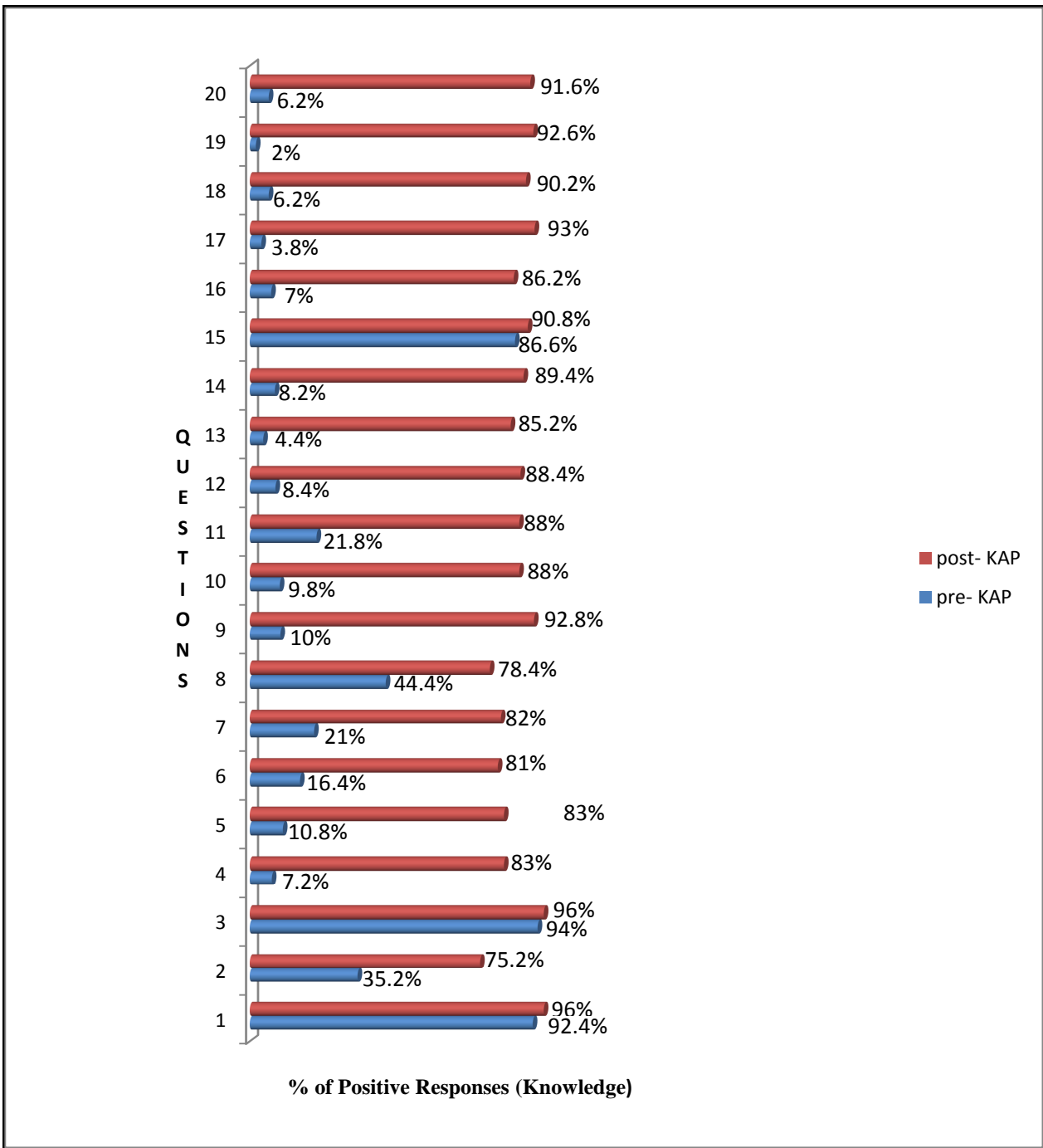**Figure No.2: Gender distribution of Participants based on Educational qualification**

Figure No.3: Comparison of % of positive responses on knowledge and awareness on dengue fever between Pre-KAP and Post-KAP questionnaire Administration

CONCLUSION

The present study demonstrates that an educational intervention can increase awareness on dengue fever among the participants (secondary school students) and incorporate this gained knowledge on dengue fever for opting disease safety. In the vision of above facts the high schools were selected because, in most of the rural areas the highest level of education available is high school level and as per the various research reports the dengue is more

prevalent among the children. The high school children can play very significant role in enlightening the rural community, their parents, neighbours, friends and others (as most of the rural population is illiterate).

ACKNOWLEDGEMENT

CONFLICT OF INTEREST

We declare that we have no conflict of interest.

REFERENCES

1. WHO Dengue and dengue hemorrhagic fever, Available at: Revised April 2002, http://www.who.int/mediacentre/factsheets/fs117/en/print.html.
2. WHO Dengue control available at: http://www.who.int/denguecontrol/mosquito/en/index.html.
3. Gubler D J. Dengue and dengue haemorrhagic fever, *Clinical Microbial Review,* 11(3), 1998, 480-496.
4. Ricco-Hesse R. Molecular evolution and distribution of dengue viruses type 1 and 2 in nature, *Virology,* 174, 1990, 479-493.
5. Alameda County Mosquito Abatement District. "Biological Notes on Mosquitoes," Life cycle of the mosquito, 2011.
6. Dengue Virus Net, "Aides" Dengue transmission by Aides aegypti mosquito, 2011.
7. WHO, Global Alert and Response (GAR), Impact of Dengue Available at: http://www.who.int/csr/disease/dengue/impact/en/.
8. India reports 37,000 dengue cases in 2012, New Delhi, December 04, 2012. Available at: http://www.hindustantimes.com/India-news/NewDelhi/India-reports-37-000-dengue-cases-in-2012/Article1-968225.aspx.
9. Soodsada N, Yoshitoku, Satoshi M. Knowledge, Attitude And Practice Regarding Dengue Among People, *In Pakse, Laos, Nagoya J. Med. Sci.,* 71, 2009, 29-37.
10. Sokrin K, Lenore M. Community and School-Based Health Education for Dengue Control in Rural Cambodia, A Process Evaluation, 1(3), 2007, 1-10.
11. Khynn T, Sian Z and Aye M. Community-based Assessment of Dengue-related Knowledge among Caregivers, *Dengue Bulletin,* 28, 2004, 189-95.
12. Gunasekara T *et al*. Knowledge, attitudes and practices regarding dengue fever in a suburban community in Sri Lanka, *Galle Medical Journal,* 17(1), 2012, 10-17.
13. Fridous J. Dengue Fever (DF) in Pakistan, Asia Pacific Family Medicine 2011, Available at: http://www.apfmj.com/content/10/1/1.
14. Centers for Disease Control and Prevention, "Dengue" Entomology and ecology, 2010.
15. World Health Organization, Dengue, Guidelines for Diagnosis, Treatment, Prevention and Control, Geneva World Health Organization and the Special Programme for Research and Training in Tropical Diseases, 2009.
16. Rodhain F and Rosen L. "Mosquito Vectors and Dengue Virus-Vector Relationships", In Dengue and Dengue Hemorrhagic Fever, *eds. D. J. Gubler and G. Kuno* (Cambridge: CABI, 2001) 45-60.

Please cite this article in press as: P. Lakshmi Kumari *et al.* Role of Pharmacist in improving the Knowledge and Prevention Practices of Dengue among selected Rural High School Children of Guntur District, *International Journal of Research in Pharmaceutical and Nano Sciences,* 4(4), 2015, 241 - 249.