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Original Research Article

AWARENESS AND PREVENTIVE PRACTICES FOR VECTOR-BORNE DISEASES AMONG SECONDARY SCHOOL STUDENTS IN TIRUPATI: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Vector-borne diseases (VBDs) such as dengue, chikungunya, and malaria remain major public health concerns in India, particularly among school-aged children who are vulnerable to mosquito exposure. Awareness regarding transmission, symptoms, and preventive measures is essential to reduce disease burden. This study aimed to assess knowledge, attitude, and practices (KAP) regarding VBDs among secondary school children in Tirupati and to identify the sociodemographic factors associated with knowledge regarding VBD.

Materials and Methods: A cross-sectional study was conducted among 400 secondary school students (12-16 years) selected through two-stage random sampling. Data were collected using a pretested, structured questionnaire covering socio-demographics and KAP related to VBDs. Knowledge scores were categorized as "good" or "poor." Associations between socio-demographic variables and knowledge levels were analyzed.

Results: Among participants, 54.8% were female, and the majority were aged 14–15 years. Overall, 44.8% had good knowledge, whereas poor attitude (65.3%) and poor preventive practices (63.7%) predominated. Knowledge was significantly associated with age ($p = 0.005$), parental education (father and mother, $p < 0.001$), parental occupation (father, $p = 0.004$; mother, $p = 0.001$), and socioeconomic status ($p = 0.034$).

Conclusions: Knowledge regarding VBDs was moderate among secondary school children, but attitudes and preventive practices were suboptimal. Targeted school-based health education programs emphasizing behavior change and practical preventive measures, with parental involvement and linkage to national vector control programs, are recommended to reduce the burden of vector-borne diseases in the community.

Keywords: Vector-borne diseases, knowledge, attitude, practice, secondary school children.

INTRODUCTION

Vector-borne diseases (VBD) constitute a major part of communicable diseases in India. They account for 17% of the estimated global burden of all infectious diseases. The Vector-borne diseases viz., Malaria, Dengue, Chikungunya, Kala-azar, Lymphatic filariasis and Japanese Encephalitis (JE) constitute major public health problems and impede socio-economic development of the country.[1]

Generally, the people living in rural, tribal and urban slum areas are high-risk groups who are more prone to develop VBDs as they belong to a low socioeconomic group.[2] These diseases are responsible for significant morbidity, school absenteeism, and economic burden, especially in urban and semi-urban settings.[2] Tirupati, a rapidly growing city with seasonal rainfall and dense population movement, presents a conducive

environment for vector breeding and disease transmission.

Considering the burden and impact, World Health Day 2014 was focused on VBD. The theme for world health day 7th April 2014 was "Small bite: Big threat" highlighting the priority area of public health. In India "National Vector Borne Disease Control Programme" (NVBDCP) under the aegis of "National Rural Health Mission" (NRHM) is an umbrella programme for prevention and control of VBD.[3]

Secondary school children constitute an important and vulnerable group as they are frequently exposed to vectors in both school and home environments. At the same time, this age group is highly receptive to health education and capable of adopting preventive behaviors. Adequate awareness regarding the modes of transmission, symptoms, and preventive measures of vector-borne diseases is essential to reduce disease incidence and promote early health-seeking behavior. Despite ongoing national and state-level vector control programs, the effectiveness of these interventions largely depends on community awareness and participation. Limited knowledge or misconceptions among school children may hinder preventive practices such as elimination of breeding sites, use of personal protective measures, and timely reporting of symptoms. However, there is a paucity of localized data assessing awareness levels among secondary school children in Tirupati.

In particular, severe VBD more likely manifests among people belonging to extreme ages. Creating awareness by providing health education to school children helps to prevent VBD related childhood mortality and morbidity and thus to educate their families.[4]

Therefore, this cross-sectional study was undertaken to assess the awareness of vector-borne diseases and their preventive measures among secondary school children in Tirupati. The findings will help identify knowledge gaps and serve as a baseline for planning targeted school-based health education programs, thereby strengthening vector-borne disease prevention and control strategies in the community.

With this background, the objectives of this study were to estimate the awareness, attitude and practice of VBD among high school children in Tirupati and to identify the sociodemographic factors associated with knowledge regarding VBD.

MATERIALS AND METHODS

A school-based analytical cross-sectional study was conducted among high schools of Tirupati (both Government and private schools). The study was done for a period of 2 months after the approval of the Institutional Ethics Committee. High school students in the age group of 12-16 years or studying 8th, 9th, and 10th standard were study population. Individuals who are willing to participate were included in the study. Students who were not willing to participate, Individuals who were absent on the day of data collection were excluded.

The study sample size of 400, calculated based on awareness regarding vector borne diseases among school children in South India is 49.6%.1 Using the formula $4PQ/L^2$, where Z value is 1.96 at 95% confidence intervals, p = 49.6%, L = Absolute precision is 5%. Sample size was 384 which was rounded off to 400.

List of all schools in Tirupati city was obtained from the Mandal education officer. There were 340 schools in Tirupati. Out of them, 68 schools are government schools and 272 schools are private and aided schools. Among them, 4 schools satisfying inclusion criteria (2 from government schools and 2 from private schools) were selected randomly. After the selection of schools, permission from the school authority was obtained to conduct the study. From each school, 100 students from 8th, 9th and 10th classes were selected randomly.

Data Collection Procedure

All subjects enrolled in the study were thoroughly interviewed using semi-structured proforma which was prepared from reviewing the literature. The data was collected regarding socio-demographic profile, knowledge, attitude and safety practices taken to prevent vector-borne diseases.

There were 5 knowledge questions (like did they get affected by VBD's, have their family members been affected, Does Dengue virus/Malaria/ Chikungunya infection parasite transmit from infected pregnant mother to baby?, Can vector-borne diseases cause death?, The same person can be infected with, Dengue/Malaria/Chikungunya more than once?)

The attitude of the study population was assessed using a 5-point Likert scale as Strongly agree-(5), agree-(4), don't know- (3) Strongly disagree-(2), disagree-(1) that includes questions such as (Is it possible to control mosquitoes?, Do you believe Dengue/Malaria/ Chikungunya is a problem in Tirupati?, Do you believe any outbreak of Chikungunya been reported in Tirupati?, Is your attitude towards vector control is positive?, Do you allow health workers to take blood samples?, Will you take part in public activity for vector control or removal of mosquito breeding sites?).

The assessment was made for the safety practice measures taken by the study population through questions such as (Did the government take any measures to prevent the transmission of vector borne disease? Do you keep the Malaria/Dengue/ Chikungunya infected person separate?, Is there any specific vaccine available for Chikungunya prevention?, Do you call health authority for fogging?, Do you call private pest control?, Any dietary restriction to a person who has Malaria/Dengue/Chikungunya?, Served by garbage collection truck?).

All correct responses were given score 1 and incorrect responses were given score 0. Mean score was calculated for each domain. Higher mean was considered as better response. Mean knowledge score

was 1.55. Students scored more than 1.55 in knowledge score were considered to have good knowledge.

Operational definitions:

Good Knowledge: students who scored half and above values from all close ended questions about the knowledge of vector borne disease

Positive attitude: Students who scored half and above values from all attitude-related questions towards vector borne disease

Good practices followed: students who scored half and above values from all close-ended questions about vector borne disease

Poor Knowledge: students who has not scored half value from all close-ended questions about the knowledge about vector borne disease.

Written informed consent was obtained from the class teacher/parent before collecting data. Approval from the Institutional Ethics Committee, SVIMS was obtained before beginning the study. The collected data was entered into Microsoft Excel. Numbers and percentages were calculated for qualitative data. Mean and standard deviations were calculated for quantitative data. The chi-square test was used to test the significance of difference between proportions. SPSS version 26 was used for data analysis. P value <0.05 was considered as significant.

RESULTS

Table 1: Distribution of study participants based on socio-demographic profile

Characteristics (n=400)		N (%)
Age in years	12	85 (21.3%)
	14	136 (34.0%)
	15	123 (30.8%)
	16	56 (14.0%)
Sex	Female	219 (54.8%)
	Male	181 (45.3%)
Class	10^{th}	147 (36.8%)
	8^{th}	60 (15.0%)
	9^{th}	193 (48.3%)
Education of father	Illiterate	39 (9.8%)
	Primary	37 (9.3%)
	Middle	70 (17.7%)
	Secondary	76 (19.0%)
	Intermediate	100 (25.0%)
	Graduate and above	78 (19.5%)
Occupation of father	Government employee	64 (16.0%)
	Private employee	81 (20.3%)
	Self employment	175 (43.8%)
	Daily wage laborer	25 (6.3%)
	Unemployed	8 (2.2%)
	Others	47 (11.8%)
Education of mother	Illiterate	52 (13.0%)
	Primary	67 (16.8%)
	Middle	65 (16.3%)
	Secondary	90 (22.5%)
	Intermediate	61 (15.4%)
	Graduate and above	65 (16.3%)
Occupation of mother	Government employee	64 (16.0%)
	Private employee	51 (12.8%)
	Self employment	77 (19.3%)
	Daily wage laborer	23 (5.8%)
	Unemployed	99 (24.8%)
	Others	86 (21.5%)
Religion	Hindu	353 (88.3%)
	Muslim	23 (5.8%)
	Christian	19 (4.8%)
	Others	1 (0.3%)
Family type	Nuclear	254 (63.5%)
	Joint	130 (32.6%)
	Three generation	16 (4.1%)
Socioeconomic status	Upper	8 (2%)
	Upper middle	49 (12.3%)
	Middle	285 (71.3%)
	Lower middle	53 (13.3%)
	Lower	5 (1.3%)

Among the 400 study participants, the majority were aged 14 years (34.0%) and 15 years (30.8%). Females constituted 54.8% of the participants. Most students were studying in 9th standard (48.3%), followed by 10th (36.8%). Nearly one-fourth of fathers had intermediate education (25.0%), while 19.5% were

graduates or above; 22.5% of mothers had secondary education. Self-employment was the most common occupation among fathers (43.8%), whereas 24.8% of mothers were unemployed. Most participants were Hindu (88.3%) and belonged to nuclear families (63.5%). A majority (71.3%) belonged to the middle socioeconomic class. [Table 1]

The distribution of knowledge, attitude, and practice (KAP) regarding vector-borne diseases among the study participants revealed overall suboptimal levels. Poor knowledge was observed in 55.3% of students, while 44.8% demonstrated good knowledge. Attitude scores showed a higher proportion of poor attitude (65.3%), with only 34.8% exhibiting a good attitude towards prevention of vector-borne diseases. Similarly, poor preventive practices were noted in 63.7% of participants, whereas 36.3% reported good practices. [Figure 1]

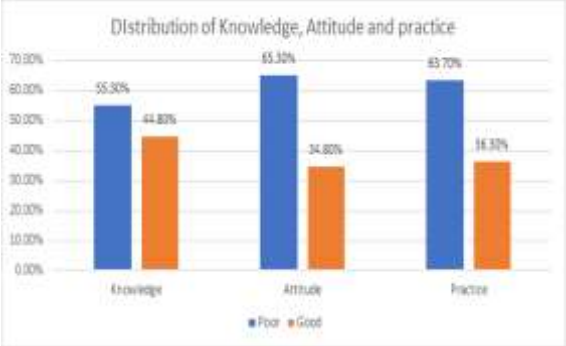

Figure 1: Distribution of knowledge, attitude and practice

Table 2: Descriptives of Knowledge, attitude and practice

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Knowledge score	400	0	5	1.55	1.297
Attitude score	400	0	6	3.99	1.306
Practice score	400	0	8	4.14	1.52

Table 3: Association between knowledge regrading VBD and socio-demographic factors

Characteristics		**Poor knowledge (n%)**	**Good knowledge (n%)**	**P-value**
Age	12	58(68.2)	27(31.8)	0.005
	14	71(52.2)	65(47.8)	
	15	56(45.5)	67(54.5)	
	16	36(64.3)	20(35.7)	
Gender	F	127(58.0)	92(42.0)	0.225
	M	94(51.9)	87(48.1)	
Class	10	80(54.4)	67(43.0)	0.745
	8	31(51.7)	29(48.3)	
	9	110(57.0)	83(43.0)	
Education of father	Illiterate	26(66.7)	13(33.3)	<0.001
	Primary	30(81.1)	7(18.9)	
	Middle	36(53.7)	31(46.3)	
	Secondary	49(64.5)	27(35.5)	
	Inter	56(56.0)	44(44.0)	
	Graduate and above	23(29.5)	55(70.5)	
Occupation of father	Government employee	22(34.4)	42(65.6)	0.004
	Private employee	45(55.6)	36(44.4)	
	Self employment	99(56.6)	76(43.4)	
	Daily wage laborer	16(64.0)	9(36.0)	
	Unemployed	2(50.0)	2(50.0)	
	Others	35(74.5)	12(25.5)	
Education of Mother	Illiterate	43(82.7)	9(17.3)	<0.001
	Primary	52(77.6)	15(22.4)	
	Middle	31(47.7)	34(52.3)	
	Secondary	55(61.1)	35(38.9)	
	Inter	20(33.9)	39(66.1)	
	Graduate and above	19(29.2)	46(70.8)	
Occupation of Mother	Government employee	28(43.8)	36(56.3)	0.001
	Private employee	22(34.4)	42(65.6)	
	Self employment	41(53.2)	36(46.8)	
	Daily wage labourer	19(82.6)	4(17.4)	
	Unemployed	51(51.5)	48(48.5)	
	Others	60(69.8)	26(30.2)	
Religion	Hindu	199(56.4)	154(43.6)	0.293
	Muslim	10(39.1)	17(60.9)	
	Christian	11(57.9)	8(42.1)	
	Others	1(100)	0(0.0)	
Family type	Nuclear	151(53.7)	130(46.3)	0.638
	Joint	27(25.0)	30(75.0)	
	Three generation	5(55.5)	4(44.6)	
Socioeconomic status	Upeer	2(25.0)	6(75.0)	0.034
	Upper middle	25(51.0)	24(49.0)	

	Middle	151(53.7)	130(46.3)	
	Lower middle	38(71.7)	15(28.3)	
	Lower	4(80.0)	1(20.0)	

Knowledge regarding vector-borne diseases showed a statistically significant association with age ($p = 0.005$). Good knowledge was highest among students aged 15 years (54.5%), whereas poorer knowledge was more common among those aged 12 and 16 years. Gender and class of study were not significantly associated with knowledge levels.

Parental education demonstrated a strong association with students' knowledge. Good knowledge was significantly higher among children whose fathers (70.5%) and mothers (70.8%) were graduates or above, while poor knowledge predominated among children of illiterate parents ($p < 0.001$). Similarly, father's occupation was significantly associated with knowledge ($p = 0.004$), with children of government-employed fathers showing better knowledge (65.6%). Mother's occupation was also significantly associated ($p = 0.001$), with better knowledge observed among children of government and private-employed mothers.

Religion and family type did not show a statistically significant association with knowledge. Socioeconomic status was significantly associated with knowledge levels ($p = 0.034$), with better knowledge observed among students belonging to upper and upper-middle socioeconomic classes, while poorer knowledge was more prevalent among those from lower socioeconomic strata. [Table 3]

DISCUSSION

The current study found suboptimal knowledge, attitude, and preventive practices regarding vector borne diseases among secondary school students, with particularly low levels of attitude and practice. This pattern aligns with previous school based research from India showing significant gaps between knowledge and meaningful preventive actions. A cross sectional survey among rural high school students in Karnataka reported moderate awareness of dengue but inconsistent practices to prevent mosquito breeding and bites.[5]

In the study conducted by Akhilijith et al, among 165 participant's knowledge of vector borne diseases was quite good. Majority of study subjects were aware about VBD causes death if untreated. Regarding the most frequent mosquito biting period maximum participants 99.39% responded with evening/night time. Almost 95.75% resonance had knowledge, that mosquito bite is the cause of dengue, malaria, chikungunya.[2]

In the study conducted by Gupta et al, all of the study participants (100%) had heard of malaria, and the main source of their information was television/newspaper. 92.5% of the study population considered malaria to be a serious health problem, thus reflecting their attitude to the disease.[6]

Age was significantly associated with knowledge, with older adolescents demonstrating better awareness. Similar age stratified knowledge differences have been observed in broader community studies of dengue where more mature respondents showed higher awareness of disease transmission and prevention.[7] Parental education and occupation were strong predictors of children's knowledge in this study, which is consistent with evidence from KAP surveys in urban and peri urban Indian populations where higher parental education correlated with better dengue knowledge and preventive behavior.[8]

No significant association was found between knowledge and gender, religion, or family type, suggesting that basic information about vector borne diseases may be reaching all demographic segments uniformly in this setting. However, the discrepancy between knowledge and practice underscores the need for behavior-focused health education interventions rather than information alone. This has been noted in other Indian studies, which emphasize that increased knowledge does not necessarily result in improved preventive actions without structured behavior change communication.[5,9,10]

From a public health perspective, our findings highlight the importance of integrating age appropriate, interactive health education into school curricula, engaging parents and teachers, and linking school health programs with national vector control strategies to close the gap between awareness and practice and thereby reduce the burden of vector borne diseases in the community. As students act as a mediator between teachers and parents, so educating students regarding VBD at the school level plays a major effective role in preventing them at a community level. In a semiliterate society, the schoolchild may be the first member of the family to receive an education. The information he/she brings home may be regarded as modern, trustworthy, and credible.

CONCLUSION

The study revealed that knowledge regarding vector-borne diseases among secondary school children in Tirupati was moderate, but attitude and preventive practices were suboptimal, highlighting a gap between awareness and action. Older students, and those with parents who were better educated or employed in government/private sectors, demonstrated significantly higher knowledge levels. Socioeconomic status also influenced knowledge, while gender, class, religion, and family type had no significant effect.

These findings underscore the need for targeted, age-appropriate, school-based health education programs that emphasize behavioural change and practical

preventive measures, alongside active parental involvement. Strengthening school health initiatives and linking them with ongoing national vector-borne disease control programs can help reduce the burden of diseases like dengue, malaria, and chikungunya in the community.

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