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STUDY OF PERSONAL PROTECTIVE MEASURES (PPM) FOR MOSQUITO CONTROL IN PRAVARA INSTITUTE OF MEDICAL SCIENCES (DU), LONI CAMPUS.

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ABSTRACT

Introduction: Being the hub of various mosquito borne diseases, a huge population of India uses different variety of personal protective measures (PPM) to avoid contact with these vectors. Using any sort of PPM is beneficial or it will have harmful effect in long run is the question of interest? **Objective:** To study awareness and use of PPM against mosquito and its adverse effects in PIMS campus. **Methodology:** A descriptive cross-sectional study conducted, after getting the IEA (institutional ethical approval) and informed consent from the participants, in the month of June-July 2017 with the help of well-designed questionnaire. Sample size of 300 was selected for the study and appropriate test were applied. **Results:** From population using PPM, majority i.e. 69.39% uses liquid vaporiser as their first choice. Among those showing signs and symptoms of headache 91.52% people uses PPM likewise 93.54% (eye irritation), 95% (rashes), 85.71% (allergy) uses PPM. 33% of population thinks it is harmful to use any PPM while 37.67% thinks its harmless while rest no comment. **Conclusion:** The commonest allergic reactions seen are headache, eye irritation and rashes are highly significant and cough & sore-throat are not significant by the Chi^2 test.

KEYWORDS: *Personal Protective Measures, Eye-irritation, Headache, Chi^2 test.*

INTRODUCTION

India being one of the countries with richest biodiversity in the world is flourished with variety of species of insects which acts as vectors for various diseases. The prevalence of mosquito borne diseases are the most common in India as more than three-fourth of population lives in malaria risk areas with 1.86 million disability adjusted life years (DALYs) lost annually.[1] Hence this makes India, the hub for various personal protective measures (PPM) manufacturers. The personal protective measures consists of mats, bed nets, repellents, liquid vaporizers, mosquito coils, & so forth and we use them blindfolded without knowing what their side effects are. Majority of these repellents consist of compound pyrethroids like prallethrin and allethrin.which are basic cyclopropane carboxylic ester.

Prallethrin is a structural derivative of naturally occurring pyrethrins. Pyrethrin is an extract from the flower Chrysanthemum cinerarilifolium and is potent against insects. Commonly used synthetic pyrethroid insecticides are Allethrin (Pynamin), Cyfluthrin (Baythroid), Cypermethrin (Ammo), Esfenvalerate (Asana), etc. The first pyrethroid pesticide, allethrin, was identified in 1949.[2]

Animal and some human studies have shown ill effects of personal protective measures.[3-5] Various allergic reactions seen with the usage of PPM are headache, Cough, sore throat, allergy, and eye irritation. And still more research is required for establishing a concrete relation between its usage and the allergic reaction.

AIMS

To study awareness and use of personal protective measures against mosquito and its adverse effects in PIMS campus.

OBJECTIVES

1. To find out the number of population using any sort of PPM.
2. To find out the relationship between the usage of mosquito repellent and occurrence of any allergic reaction due to it.

METHODOLOGY

It was a descriptive cross-sectional study. The study was conducted, after getting the IEA (institutional ethical approval) letter from the institute and informed consent was signed by the participants once they qualified the eligibility criteria, in the campus of Pravara Institute of Medical Sciences. The eligibility criteria were as follows.

- Inclusion criteria.
  - The individual should not have any known allergic condition.
  - Staying in the PIMS campus.
  - Willing to participate.
- Exclusion criteria.
  - The individual not willing to participate.
  - The individuals suffering from any chronic allergic conditions due to known reason.

STUDY CONDUCT

Each participant was provided with token number for further convenience of the study. Before proceeding towards data collection the permission from the respective authorities was taken and the participants were told about the time and day .The relevant data was collected by using the questionnaire which consist of demographic data such as name, age, sex, faculty and then about the usage of the Personal Protective Measures. Questions were used to evaluate the participants' knowledge regarding the various PPM available in the market. After this clinical examination was done. Once the data was collected, the investigator compared both of the data obtained and analysed by using Microsoft excel and using Chi^2 test.

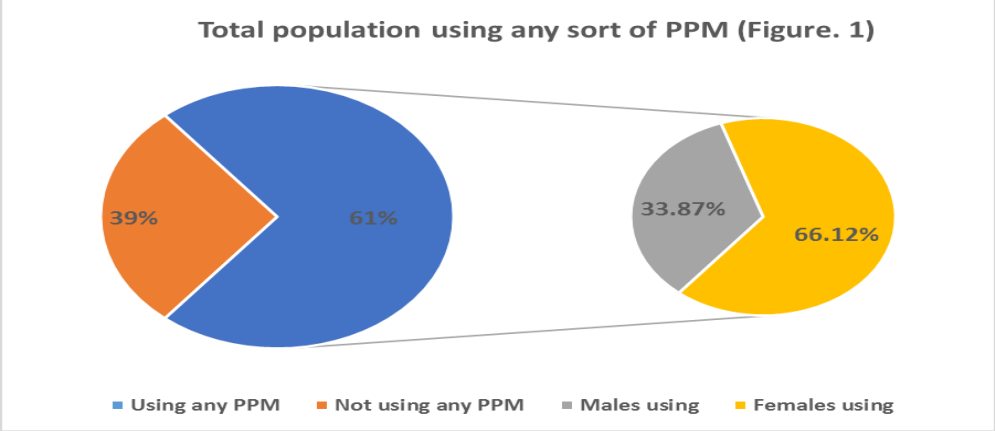
Sample size

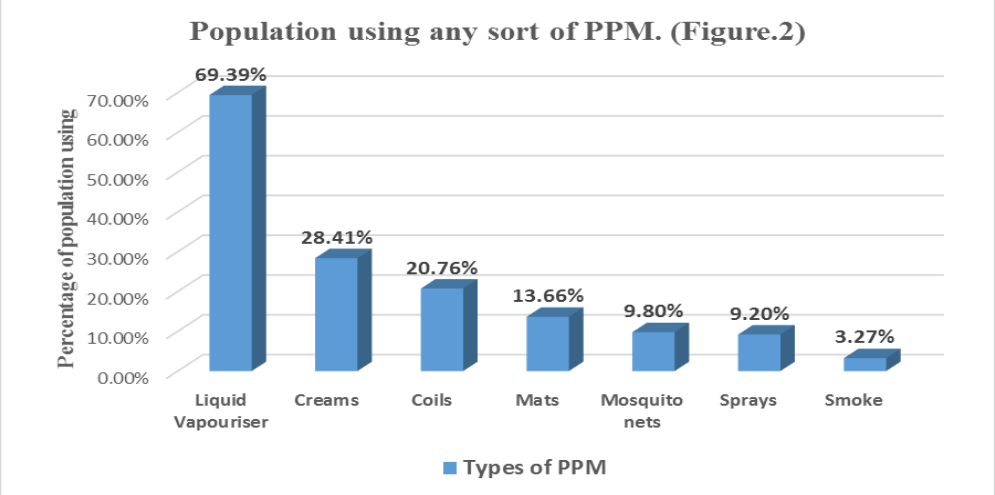
The sample size for the study was 300 comprising of groups covering the students from medical, dental, physiotherapy & nursing fraternity living at different sites within campus. It was calculated by taking p=0.63 from the study "usage and perceived side effects of personal protective measures against mosquitoes among current users in Delhi" as 63% uses PPM[6] and taking 5% allowable error, we got sample size of 368 which was rounded of up to 300 for convenience.

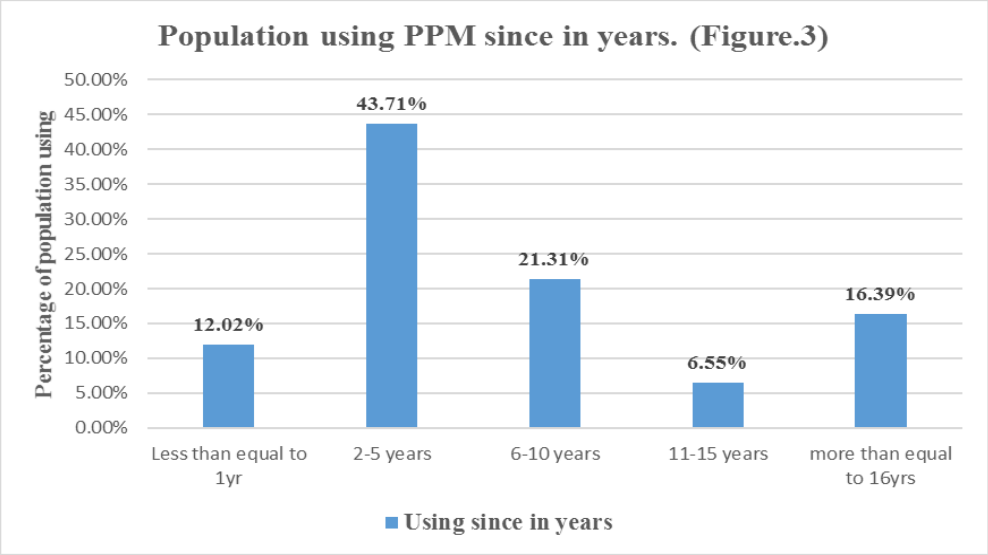
This was covered by considering 150 participants from boy's hostel covering medical, dental, physiotherapy & nursing disciplines; 150 from girl's hostel medical, dental, physiotherapy& nursing disciplines in campus.

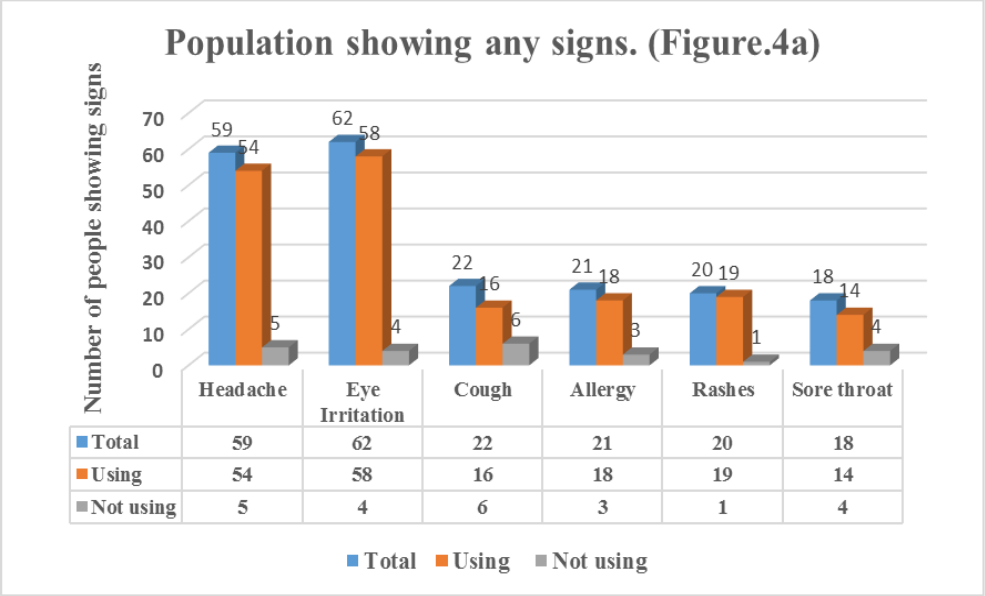
Results were shared to participants in common hall where health talk on PPM was given to cover the gaps in knowledge.

OBSERVATIONS







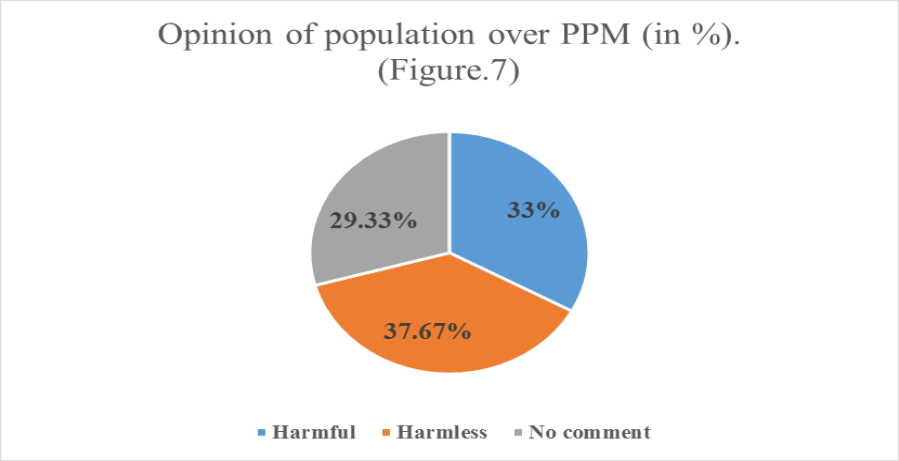


Significance of side effects of using PPM by Chi^2 test :- (Figure. 4b)			
Side effects	**Chi ^{2} value**	**P value**	**Significance**
Eye irritation	33.09	0.0001	Extremely significant
Headache	27.19	0.0001	Extremely significant
Cough	0.892	0.344	Not significant
Allergy	4.734	0.0296	Significant
Rash	8.938	0.0028	Significant
Sore throat	1.578	0.2091	Not significant

Relationship between duration of usage and signs in individual using PPM.(Fig.5)						
Using since (in yrs.)	**Signs seen (in numbers)**					
	Headache	**Cough**	**Sore-throat**	**Allergy**	**Eye-irritation**	**Rashes**
1yr and less	8	0	0	2	5	0
2-5 yrs	27	6	9	10	22	11
6-10 yrs	7	4	0	1	13	5
11-15 yrs	4	2	4	1	8	1
+16yrs	6	4	1	4	10	2
Total	54	16	14	18	58	19

Relationship between usage of various PPM and signs in individual using PPM.(Fig.6)						
SIGNS	**Personal Protective measures (PPM) in no. (In %)**					
	Liquid Vaporiser	**Cream**	**Nets**	**Sprays**	**Burning smoke***	**Smoke**
	N=127	**N=52**	**N=18**	**N=17**	**N=63**	**N=6**
Headache	38(29.9%)	15(28.84%)	1(5.55%)	9(52.94%)	21(33.33%)	4(66.67%)
Cough	14 (11%)	4(7.69%)	3(16.66%)	5(29.41%)	7(11.11%)	1(16.7%)
Sore-throat	13 (10.2%)	2(3.84%)	0	3(17.64%)	4(6.34%)	1(16.7%)
Allergy	14(11%)	8(15.38%)	0	5(29.41%)	3(4.76%)	2(33.4%)
Eye irritation	46(36.22%)	22(42.3%)	1 (5.55%)	4(23.52%)	35(55.56%)	3(50.3%)
Rashes	14(11%)	10 (19.23%)	0	4(23.52%)	5(7.93%)	1(16.7%)

***burning smoke consist of burning coils and mats whereas smoke is the smoke from burning agarbattis and other natural methods like citronella candles or lavender essential oil.**



DISCUSSION

Out of total sample size of 300, 183 uses any of the aforementioned personal protective measures (PPM), and in that 62 are male population whereas 121 are female population (figure 1). Out of the total population using PPM, majority of population i.e. 69.39% uses liquid vaporiser as their first choice followed by creams (28.41%), coils (20.76%), mats (13.66%), Mosquito nets (9.8%), sprays (9.2%) and smoke (3.27%) as shown in figure 2.

And the duration of usage is maximum in the range of 2-5 yrs.' that is 43.71% followed by 6-10 yrs.' (21.31%), more than equal to 16 (16.39%), less than equal to 1yr (12.02%) and 11-15 yrs.' (6.05%) as illustrated in figure 3. Among the population showing signs and symptoms of headache 91.52% people uses PPM likewise 93.54% (eye irritation), 95% (rashes), 85.71% (allergy), 77.77%(sore-throat) and 72.72% (cough)while using any sort of PPM as shown in the figure 4a. By applying the Chi^2 test, we conclude that the side effects such as Eye-irritation and Headache are extremely significant with the usage of PPM, that of allergy and rash are significant whereas that of cough & sore-throat are not significant to PPM usage.(figure.4b).

A relationship between the duration of usage and the signs & symptoms showed by the individuals has been established as seen in the figure 5 telling us that maximum prevalence is found in the people using any sort of PPM since 2-5 year range and then gradually goes on decreasing as the duration advances. And lastly figure 6 coins a relation between the type of PPM used and the allergic reaction occurring because of it and showed that Liquid vaporiser, creams, mats, coils and smoke are the types of PPM mostly causing eye-irritation whereas sprays caused more number of headache than other PPMs. Mosquito nets being the mechanical barrier was found relatively the safest among all the PPMs.

On questions evaluating the knowledge of the participants it was concluded that, 33% of population thinks it is harmful to use any PPM while 37.67% thinks its harmless where as 29.33% didn't commented over it as evident in figure.7. majority of population advised for better pest controlling in the campus along with clearing the stagnant water with usage of natural methods of using citronella candles and lavender oil and gambusia fish.

CONCLUSION

61% of population uses any of the personal protective measures (PPM) and majority of population using liquid vaporiser i.e. 69.39%.

The most common allergic reactions seen are headache, eye irritation and rashes among all the signs and symptoms which are supported by the Chi^2 test. Mosquito nets being the most safest and effective

amongst all the PPMs and fair number of participants knows about the side-effects of using various PPMs.

Suggestions

Promote usage of mosquito nets as it can be considered the best personal protective measure. Promote cleanliness around the campus by using various other physical measures of preventing the mosquito breeding.

Limitations: Although prior precautions were taken to rule out other pre-existing illness, in some cases signs could be due to causes other than PPM usage.

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