

The Perception of Knowledge Attitude and Practice about light pollution among the residents of Kolar town

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Abstract:

Introduction: -Light pollution is the presence of excessive or unwanted artificial light in the environment, which can have harmful effects on human health and the environment. Light pollution is increasingly affecting ecosystems and all living beings. It has become world-wide problem as it is gradually diminishing the capacity to observe the stars.

Aim of the study: -This study aims to examine the prior knowledge, attitudes, and awareness of the light pollution phenomenon among the people of Kolar.

Materials and methods: -This is preliminary research by undergraduate students in Allied health department at SDUAHER University. The study was carried out on questionnaire sheets. It was a cross-sectional survey of 120 subjects selected through purposive sampling. The questionnaire sheets were given to 120 people by our research students. The questionnaire consisted of 15 item questions which were close ended and choice questions. The development of the questionnaire considers indicators of prior knowledge, attitudes, and awareness in the case of the light pollution phenomenon. The reliable Cronbach's alpha score for the study was of Guttman reliability coefficient 0.671. The SPSS 20 Version. Descriptive statistics was performed and expressed in terms of proportions and presented

Results and Analysis: - The study showed that 95.8% of the subjects had an average initial knowledge about light pollution with the "good" category, and 51% of them have an attitude of caring for the environment in the case of light pollution phenomena with the category of "care". And the final result is that 74% of them realize that the impact of light pollution is a crucial issue

Conclusion: - The findings of this study can help the public, healthcare workers to identify and rectify incorrect knowledge and behaviors of residents and understand their needs.

Key words: Light pollution, Awareness, Knowledge, Practice, Attitude, Environment

Introduction:

Light pollution is the inappropriate use of artificial light that causes adverse effects on the environment [1] Light pollution is the presence of excessive or unwanted artificial light in the environment, which can have harmful effects on human health and the environment. [2] It is increasingly affecting ecosystems and all living beings. It has become world-wide problem as it is gradually diminishing the capacity to observe the stars. [3] The Rapid urbanization and globalization have fostered a "night lifestyle," where people engage in late-night activities, increasing artificial light use and contributing to light pollution. This excessive and unnecessary illumination, especially from outdoor sources, negatively impacts human health, wildlife, and ecosystems. Residential, traffic, and commercial lighting are the primary sources, with commercial lighting being the most intrusive.

Light pollution disrupts sleep patterns, affects circadian rhythms, and has been linked to vision problems, retinal stress, and even skin cancer. [4] Artificial light influences not only humans but also wildlife, impacting both species exposed

to direct light e.g., birds in cities and mammals near highways, and wildlife far from light sources. This occurs through sky glow, where light radiating upwards from light sources in urban areas is diverted back to Earth through scattering, illuminating areas far from the original light Source [5]

It also contributes to the decline of insect populations, including moths and butterflies. Additionally, excessive artificial lighting diminishes the ability to observe stars, impacting astronomy and cultural heritage. While global research highlights these consequences, in our country has got limited studies on this issue. Hence in Kolar, Karnataka awareness remains low, making a knowledge, attitudes, and practices (KAP) survey essential in identifying the gaps and guiding effective awareness programs to mitigate the adverse effects of light pollution this study was taken. [6,2,7,8]

Aim and Objective: - To determine the knowledge understand their attitude and study the behavior towards the light pollution by using the questionnaire

1. To determine the knowledge among the residents of Kolar to the light pollution using questionnaire.
2. To understand the attitude towards the light pollution using the questionnaire
3. To study the behavior of the people towards the light pollution using the questionnaire

Materials and methods :

This study was undertaken in Kolar town after the ethical clearance dated 7-2-2024 from the Institutional ethical committee bearing the no SDUAHER/ IEC/ MJ/ 181 / 23-24 studied during the months of March to May 2024. An expert validated questionnaire was used. The reliability coefficient Cronbach's alpha score was 0.671 calculated for the study to be carried out after the approval of the study with a score of Guttman reliability coefficient.

Sampling technique: - It was a cross-sectional survey of 120 subjects selected through purposive sampling using the formula.

Sample Size: The formula for calculating the sample size is $-n = [\mu\alpha^2 p (1-p)/\delta^2] \times (1 + 20\%)$, $\alpha = 0.05$, $\mu\alpha = 1.96$, $p = 0.6459$, $\delta = 0.15p$, $n \approx 120$. [9]

The study was conducted among the residents of Kolar with the understanding of their knowledge, attitude, and practice towards light pollution using a questionnaire.

Inclusion criteria: - The sample included subjects who cooperated very well and regularly outdoors in good health with mental fitness and above the age of 18yrs living in Kolar for more than a year and who were willing to participate in the study.

Exclusion criteria: - Subjects who were mentally disabled always indoors and stayed less than a year at Kolar town were not taken for the survey. A brief information about the study in local language was provided and informed consent was obtained from the subjects

The validated questionnaire was divided into the following divisions Part I the demographic details, Part II the knowledge regarding their basic concepts on light pollution Part III study of the attitude regarding the information of light pollution and health protection and finally part IV which dealt with the protective behaviors against the light pollution. The data was then analyzed using the SPSS 20 Version. Descriptive statistics was performed and expressed in terms of proportions and presented. Chi-square tests were applied for demographic factors. Multiple logistic regression was used to assess the associations between knowledge outcome and the demographic factors, and 95% confidence intervals (CIs) were presented. $P < 0.05$ was considered statistically significant.

Results:

Table.1 Demographic profile of the population of Kolar

SL NO	PARAMETERS	SUB DIVISION	POPULATION N=120 N(%)
1.	Gender	Males	49 (40.8)

		Females	71 (59.2)
2.	Religion	Hindu	114 (95.0)
		Muslims	05 (4.2)
		Christians	01 (0.8)
3.	Marital Status	Unmarried	38(31.6)
		Married	82 (68.4)
4.	Education	Illiterate	01 (0.8)
		Primary	09 (7.5)
		Secondary	31 (25.8)
		Graduation	68 (56.7)
		Post-graduation	11 (9.2)
5.	Occupation	Agriculturist	1 (0.8)
		Business	6 (5)
		Students	61(50.8)
		House wife	17 (14.2)
		Skilled	31 (25.9)
		Unskilled	04 (3.3)

As presented in Table 1 Among the 120 subjects participated 49 (40.8%) were males and 71 (59.2%) were females. Regarding the religion 114 (95.0%) were Hindus followed by Muslims and Christians with 05 (4.2%) ,01 (0.8%) respectively. It was observed from the marital status that 82 (68.4%) were married and rest 38 (31.6%) were unmarried.

One among them was illiterate with 68 (56.7%) being graduated and 11(9.2%) were found to be post graduated and rest were primary and secondary school completion with 09(7.5%) and 31(25.8%) respectively.

Seeing their Occupation 61(50.8%) were students and the least was the Agriculturist with 1 participant of (0.8%) followed by 31 (25.9) skilled workers, 17 (14.2%) House wives, 6 (5%) Business men and 04 (3.3%) unskilled workers.

Table 2: Survey regarding Knowledge on Light pollution in Kolar town

	Survey question	Response N=120 n(%)
1.	Do you think there is light pollution	
	Yes	115 (95.8)
	No	05 (4.2)
2.	Are you worried of the light pollution in your place	
	Yes	104 (86.7)
	No	16 (13.3)
3.	From where did you gain knowledge about light pollution?	
	Television	22 (18.3)
	Mobile Phone	69 (57.5)

	News Paper	03 (2.5)
	Public	26 (21.7)
4.	What do you think contributes to light pollution?	
	Streetlight	13 (10.8)
	Vehicular light	25 (20.8)
	Outdoor area lighting	12 (10.0)
	Industrialization	44 (36.5)
	Illuminating sporting venues	01 (0.9)
	Factories	25 (20.8)
5.	Which part of the body gets affected by light pollution	
	Eyes	100 (83.3)
	Heart	00
	Kidneys	00
	Brain	20 (16.7)
6.	What is your knowledge regarding light pollution?	
	I think it will harm the eco system	15 (12.5)
	I think it will disturb our sleep	42 (35)
	None of the above are true	09 (7.5)
	All the above	54 (45)

As seen in Table 2 regarding the knowledge acquired out of the 120 participants, 115 (95.8%) acknowledged that there was light pollution in their surroundings, and 104 (86.7%) expressed concern about its impact.

When asked about sources of awareness regarding light pollution, 69 participants (57.5%) reported gaining knowledge through mobile phones, followed by 26 (21.7%) through public platforms, and 22 (18.3%) through television.

In terms of contributors to light pollution, 44 participants (36.5%) identified industrialization as the main cause, while 25 (20.8%) each attributed it to vehicular lights and factories operating at night. Other contributors included street lighting (13 participants; 10.8%), illuminated outdoor areas (12 participants; 10.0%), and illuminated sports venues (1 participant; 0.9%).

When asked which part of the body is most affected by light pollution, a majority of 100 participants (83.3%) believed it was the eyes, while 20 participants (16.7%) felt the brain was affected. Regarding the knowledge of light pollution, 54 (45%) participants responded, that it disturbs sleep, 15 (12.5%) said it harms the ecosystem. 9 participants (7.5%) believed that light pollution does not harm them in anyway and 54 (45%) said all of the above aspects is true.

Attitude

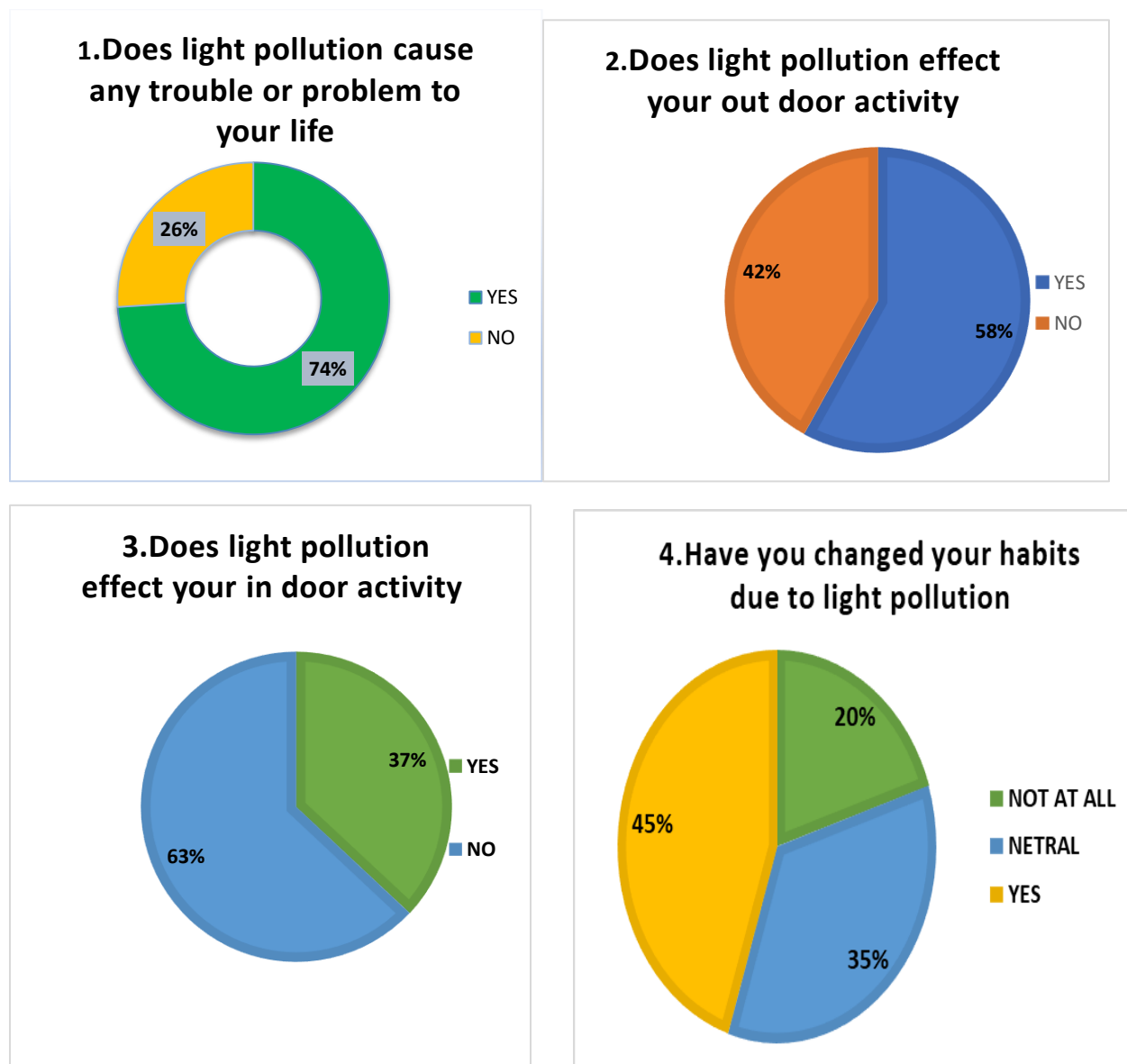
Regarding the attitude of the participants towards the light pollution 89 (74%) agreed the light pollution causes trouble to them and when specifically questioned regarding the outdoor and indoor 70 (58%) felt as it hampers them in the

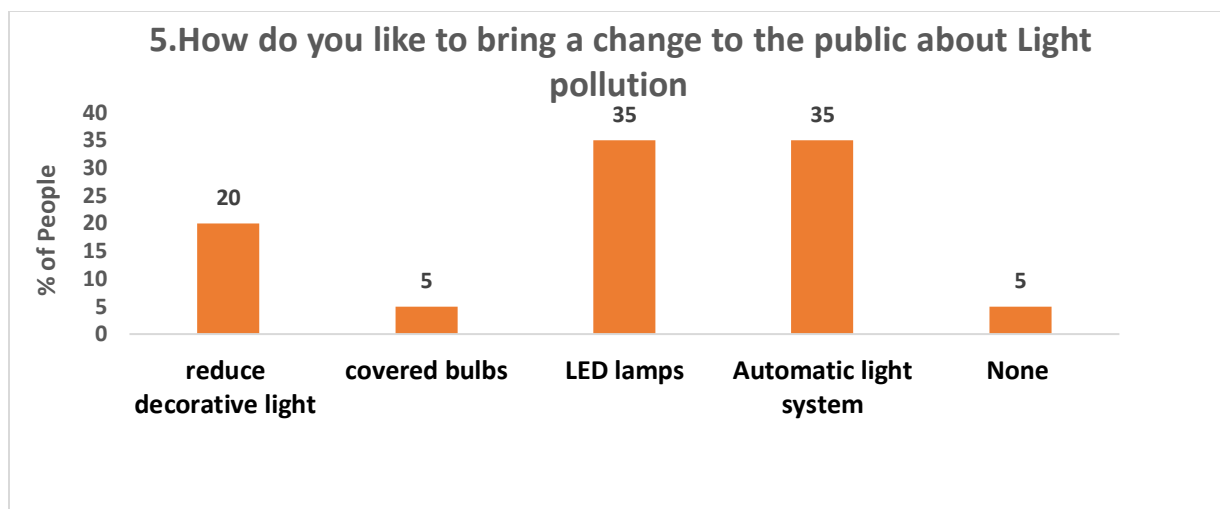
outdoor activities and 44(37%) said in their indoor activity. 54(45%) of the people said they changed their habits due to this pollution

When questioned of how would they like to bring a change in the public regarding this type of pollution 42 (35%) each attributed they would shift to the LED lamps and to use the automatic system to turn off street light. 25(20%) said they would reduce the decorative lights 06 (5%) said that they would prefer using of covered bulbs that faces the light downwards and 06 (5%) did not respond to any question.

B. Survey regarding Attitude on Light pollution in Kolar town

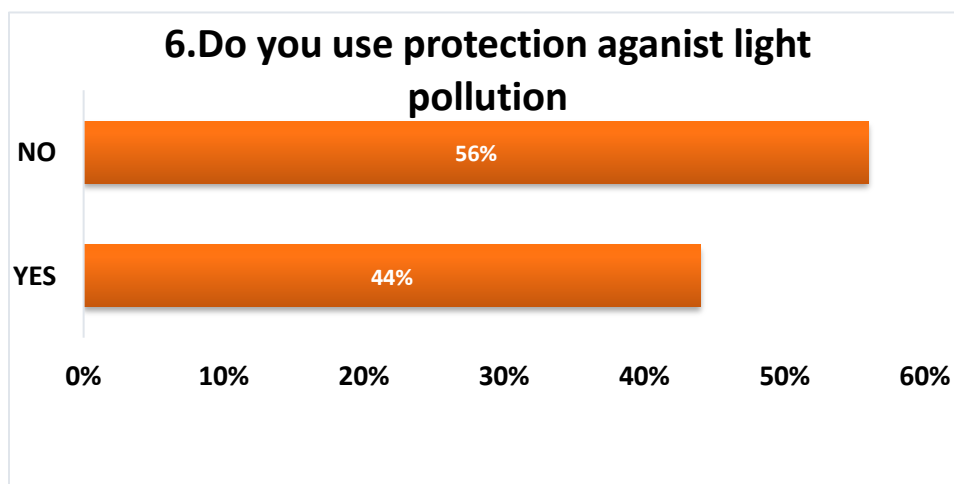
Figure 1.2.3.4.5



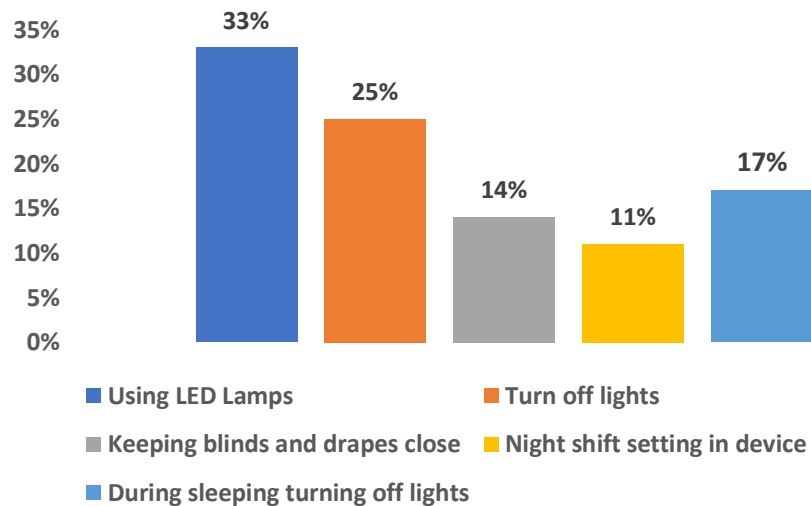


C. Survey regarding Practice of Light pollution in Kolar town

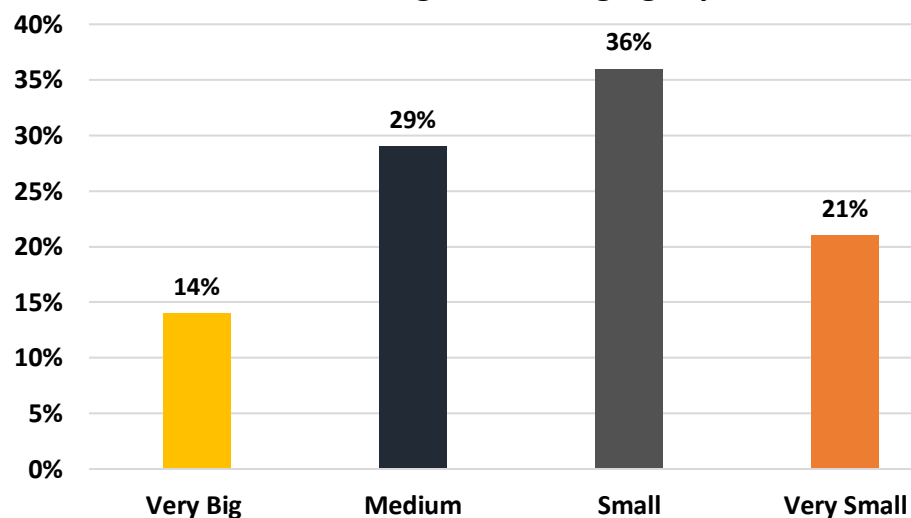
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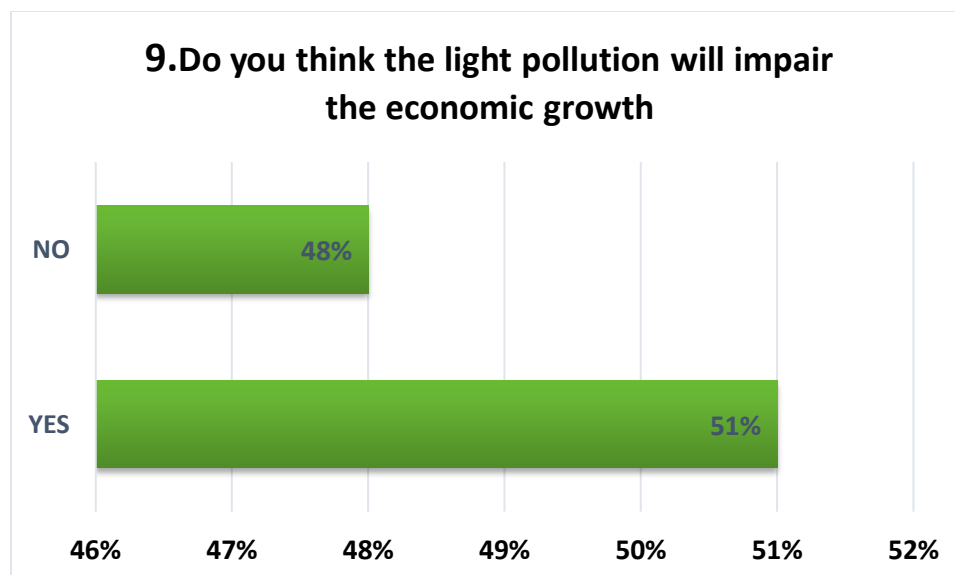


7. How do you protect your self from light pollution



8. Government rating in handling light pollution





Practice

When questioned regarding how would they protect from the light pollution 53(44%) of the participants said that they use protective measures for the light pollution. 40 (33%) said they will use LED lamps to protect themselves and 13(11%) said that they will switch on to night shift setting in device. Around 25(21%) of the participants felt that minimal effort is taken by the Government in the handling of light pollution and 62(51%) felt that economic growth would get impaired due to light pollution.

Discussion:

Awareness of light pollution in India remains relatively low compared to other environmental issues. A study indicated that while many people are affected by excessive artificial lighting, there is limited understanding of its broader implications. While air, water, soil, and noise pollution are widely studied, light pollution receives little attention despite its environmental impact. Outdoor lighting significantly threatens astronomy. [10] Regarding the knowledge acquired by in our study, most participants were aware of light pollution in their locality. They reported that this knowledge was primarily gained through media sources and interactions with the public. The majority identified industrialization and vehicular light emissions as the main causes of this pollution. Participants also recognized that the eyes were the most affected organ and mentioned that light pollution often disturbed their sleep.

Table.3 Association between demographic characteristics and knowledge of Light pollution

Parameter	Population N=120	χ^2	Df	P Value
Occupation		21.696,	6	0.001
Are you worried about light pollution at your place				

A Chi-square test of association was conducted to determine the association between demographic data and knowledge it was seen that occupation and knowledge regarding light pollution among the participants revealed a statistically significant $P=0.001$ association between knowledge level and occupation. Chi square test for the association with $P<0.05$. This indicates that knowledge about light pollution varied significantly across different occupational groups. having skilled business workers and house wives. In the domain of knowledge, a good level of their knowledge is influenced by several factors including previous knowledge, experience, sources of information, environment, and the role of their occupation [11]

With respect to their attitudes toward light pollution, around 74% acknowledged experiencing problems related to it. About 58% felt that light pollution affected their outdoor activities, while 37% stated that it disturbed their indoor

routines. Many participants reported adopting preventive measures such as switching to LED lamps and using automatic lighting systems to minimize harm. However, 5% of the subjects showed no change in their attitudes or habits regarding light pollution, but did not show any significant association with the demographic data.

In terms of practices, 44% of the respondents stated that they protected themselves by using LED bulbs and turning off lights during sleep. About 36% believed that the government's contribution toward reducing light pollution was minimal, while 51% felt that this form of pollution negatively impacts economic growth. No significance was observed with any of the demographic profile

Conclusion:

The purpose of highlighting this topic of light pollution is to bring awareness to the relatively lesser-known pollutants' which are causing equivalent damage as compared to the other.

Addressing light pollution in India requires a collaborative effort involving policymakers, urban planners, and the public to implement effective solutions and foster a culture of responsible lighting.

The use of excessive decorative lights or harmful lights is a few causes that can be easily reduced as they have efficient alternative present that will help minimize the damage. Not using unnecessary lighting switching off lights when not required, using fixtures, minimizing illumination using daylight, spreading awareness, etc are root ways to start move ahead in our future to reduce light pollution Overall, increased education and advocacy are essential to shift public attitudes and promote collective action against light pollution. By adopting these measures, we can preserve the night sky, save energy, and protect both human and ecological health.

Conflict of interest- Nil

Acknowledgement

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References:

- [1] NAOJ, N. A. (2018). *Polusi Cahaya*. Japan: Public. Retrieved <https://langitselatan.com/2018/11/09/brosur-polusi-cahaya>
- [2] Chepesiuk R. Missing the dark: health effects of light pollution. *Environ Health Perspect* 2009 Jan;117(1): A20-7. doi: 10.1289/ehp.117-20.
- [3] Jari Lyytimäki & Janne Rinne (2013) Voices for the darkness: online survey on public perceptions on light pollution as an environmental problem, *Journal of Integrative Environmental Sciences*, 10:2, 127-139, DOI: 10.1080/1943815X.2013.824487
- [4] Raap, T.Pinxten,R.,&Eens,M.(2015).Light pollution disrupts sleep in free-living animals. *Scientific Reports*,5(1). <https://doi.org/10.1038/srep13557>
- [5] Lee SXT, Amir Z, Moore JH, Gaynor KM, Luskin MS. Effects of human disturbances on wildlife behaviour and consequences for predator-prey overlap in Southeast Asia. *Nat Community*. 2024;15(1):1521. <https://doi.org/10.1038/s41467-024-45905-9>.
- [6] Kaushik K, Nair S, Ahamad A. Studying light pollution as an emerging environmental concern in India. *J Urban Manag*. 2022;11(3):392-405.

- [7] Smolensky MH, Sackett-Lundeen LL, Portaluppi F. Nocturnal light pollution and underexposure to daytime sunlight: complementary mechanisms of circadian disruption and related diseases. *Chronobiol Int.* 2015;32(8):1029-48
- [8] Candolin U, Filippini M. Environmental impacts on ecological systems. *BMC Environ Sci.* 2025;2(1):1. doi:10.1186/s44329-025-00017-7.
- [9] Prasanth V, Usha G Shenoy The Study of the Knowledge, Attitude, and Practice about the Air Pollution among the Residents of Kolar Town of South India. India. *Indian Journal of Public Health Research and Development* 2025;16 (1)
- [10] Riegel, K.W.(1973).Light pollution :Outdoor lighting is a growing threat to astronomy. *Science*, 179(4080), 1285–1291. <https://doi.org/10.1126/science.179.4080.1285>
- [11] Bestiantono, D.S., Hariyono, E., & Suprpto, N. (2023). Light Pollution Phenomenon: Prior Knowledge, Attitudes, and Awareness of Physics Undergraduate Students at State University of Surabaya. *Jurnal Penelitian Pendidikan IPA*, 9(1), 149–153. <https://doi.org/10.29303/jppipa.v9i1.2637>