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Assessing level of pre and post interventional knowledge and attitude for dengue awareness among selected government school student of Bhopal, India

J. S. Meena¹, Rajendra Mahore¹*, Abhishek Sahay², S. S. Sengar¹

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*Correspondence:

Dr. Rajendra Mahore,

E-mail: drrajendramahore@gmail.com

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ABSTRACT

Background: Dengue is a major public-health issue all over tropical and sub-tropical regions of the world. It is the most rapidly spreading mosquito-borne viral disease, which shows a 30-fold increase in global incidence over the past 50 years. According to the estimates from the World Health Organization 50-100 million dengue infections occur each year and that to add to the seriousness that around 50% of the world's population lives in countries where the disease is endemic

Methods: Educational Interventional cross-sectional study done in 2 selected Govt. Higher Secondary School in Bhopal. 100 students were selected in both school in which 50 boys and 50 girl's student selected. A pretested, semi-structured questionnaire developed by investigator which comprised of 36 questions. The interviewee who was willing to participate in the study was given the questionnaire and was asked to fill the questionnaire before and after the educational intervention and the results were analyzed.

Results: The study involved a total of 100 students who successfully answered all the baseline and follow up questionnaire. A total of 50% male students and 50% female students were present in this study. This study showed of significance increase in knowledge and significance change in their attitude after the post intervention questionnaires.

Conclusions: The knowledge about dengue fever was good among students, attitudes towards to keep their surroundings was also good; however, it was found that the good knowledge and attitudes does not necessarily lead to good practice. Health education programme should be continued and intensified with emphasis on school, college students and young adults.

Keywords: Attitude, Dengue, Knowledge, Student

INTRODUCTION

Dengue is a vector-borne disease that is a major health issue worldwide. It is caused by the dengue virus (DENV, 1-4 serotypes), which is one of the important arboviruses in tropical and subtropical regions.^{1,2} Infection by a

serotype provides lifelong immunity against that particular serotype, but further infection with other serotypes leads to deadlier form of dengue. But each serotype alone is able to produce the full spectrum of disease.³ It is mainly transmitted by *Aedes aegypti* mosquito and also by *Aedes albopictus*.⁴ In India, first

¹Department of Community Medicine, Gandhi Medical College, Bhopal, Madhya Pradesh, India

²Project Coordinator Routine Immunization Pneumonia and Diarrhoea Supportive Supervision Program IAPSM, Bhopal, Madhya Pradesh, India

dengue reported case in Madras (now Chennai) in 1780, and the first outbreak occurred in Calcutta (now Kolkata) in 1963; subsequent outbreaks have been reported in different parts of India.^{5,6} Since 1956, four serotypes (1-4) of dengue virus have been reported in various parts of the India.⁷

The incidence of dengue has grown dramatically around the world in present century. A vast majority of cases are self-limiting, and hence the actual numbers of dengue cases are under-reported. Many cases are also misdiagnosed as other febrile illnesses.⁸

The number of dengue cases reported annually to WHO has increased from 0.4 to 1.3 million in the decade 1996-2005, reaching 2.2 million in 2010 and 3.2 million in 2015. Last 50 years, incidence has augmented 30-fold with increasing geographic spreading out to new countries and within this decade, from urban to rural settings. The estimated global annual incidence of symptomatic cases is about 50 million-100 million who were predominantly from Asia, followed by Latin America and Africa. The estimated annual incidence of symptomatic cases is about 50 million-100 million who

The dengue was mostly restricted to urban and semiurban areas of the country because of the availability of favorable breeding sites of dengue vector. However, over period of time there was a paradigm change in the drift of incidence of dengue from urban to rural areas as a result of urbanization, industrialization, large scale development activities and rapid transportation which made the rural areas encouraging for dengue vector breeding these developments have resulted in repeated outbreaks of dengue in rural parts of the country.¹² Rapid increase the population, lack of exact information about dengue infection and preventive measures, environmental changes and increased breeding of Aedes mosquito within the living location resulted in higher transmission of disease.^{13,14}

High rainfall and low temperatures are associated with increased number of dengue cases. 15 since there is no specific treatment to control Dengue virus, the vectors involved in transmission are targeted through chemical vector control programs. But they provide only limited feasibility due to personnel and financial requirements, vector resistance and problems in implementation of programs. 16,17

Therefore WHO and Centers for Disease Control and Prevention recommends limited reliance on Vector control and more emphasis on community education that emphasize "individual responsibility in reducing vector breeding sites". ¹⁸ This is supported by prior study which reveals that community education can be more effective in reducing dengue vector breeding sites than chemicals alone. ¹⁹

METHODS

Type of study: observational study.

The objective of the study was to assess the knowledge and attitude of school student regarding dengue and its prevention before and after the administration of planned teaching programme. Educational interventional study was done in 2 selected Government Higher Secondary School (Government HSS Boys, Model Shahaiahanabad and Sultania Government Girls Higher Secondary School) in Bhopal. Which was selected randomly from the list of schools coming under the Urban field practice of department of Community Medicine, GMC Bhopal with the approval from the School administration. 100 students were purposively selected involving 50 boys and 50 girls from class 10th, 11th and 12th. These students were randomly selected from the list of students, present on the particular day. No separate exclusion criterion for the selection of participants was considered. Study was conducted from September 2019 to December 2019. The participants were briefed about the nature of the study, consent was taken. A pretested, semi-structured questionnaire developed by investigator which comprised of 36 questions. Before planned teaching programme pretesting questionnaire were administered. Planned teaching programme (by lecture method, interactive/participative teaching, pamphlets, poster, Street show by 12 medical students) and dengue awareness rally was conducted by department of community medicine together with school student and 6th semester medical student. The post-test was carried out after 7 days, using the same tool as the pre-test. Post-test was conducted to know the effectiveness of planned teaching programme, rally and Street show (Nukkad natak). Questionnaire was divided into three sections which included:

- Sociodemographic profile
- Knowledge and awareness about the dengue
- Attitude related to dengue

The study was an applied aspect of medical education in the Department of Community Medicine and the 6th semester students which were posted in the department collected the data during their 3-month problem solving for better health (PSBH) project learning process. The team for data collection comprised of 11 MBBS students, 1 MD student of Community Medicine under supervision of 2 faculty members from the department. Data analysis was done in Microsoft Excel. Confidentiality of each participant was ensured.

RESULTS

This study was conducted with 50 boys and 50 girl's school students. mean age of these student was 17.04 year. Average family size of 6.5 person/family. 100 students from two different Government higher secondary school in Bhopal were surveyed. Among the interviewed

persons 50 were males and 50 were females. 70% family were joint family. 13 students studying in middle, 38 students in high school and 49 students were studying in higher secondary. The socioeconomic status of households was calculated using modified B G Prasad scale, most of the households were in middle class (31%) and lower middle class (29%) (Table 1).²⁰

Table 1: Baseline characteristics of study participants (n=100) (socio-demographic profile).

| | Variable | Frequency (%) |
|--|-------------------------|---------------|
| Deligion | Hindu | 65 |
| Religion | Muslim | 35 |
| Education | Middle | 13 |
| status | High school | 38 |
| status | Intermediate | 49 |
| Type of family | Nuclear | 30 |
| | Joint | 70 |
| g . | Lower class | 17 |
| Socio economic | Lower middle | 29 |
| status according to modified BG Prasad classification January 2019 | class | 29 |
| | Middle class | 31 |
| | Upper middle class | 19 |
| | Upper class | 4 |
| | Government employees | 15 |
| Father/mother Occupation | Skilled workers | 27 |
| | Professional workers | 15 |
| | Businessmen | 8 |
| | Laborer | 35 |

Among the study population, 100% heard about dengue fever. Television (26%) emerged as the major source of information on dengue in the present study. 77% participant were seen/heard Government initiatives for control, spraying, fogging, 24% student were experienced fever in last month in yourself or family member and 8 student out of 100 were experienced dengue in yourself or family member (Table 2).

Among the study 55 out of 100 students correctly responded the disease caused by virus, 33% participants responded were aware dengue is transmissible disease, 87% of study participants correctly responded the diseases transmitted by mosquito in pre educational intervention while 100% aware the post intervention survey, 81% students were aware dengue linked with water collection in pre intervention and awareness increase up to 98% in post intervention, only 58% students responded the mosquitoes transmitted disease name were dengue and 56% students responded malaria and post educational intervention this figure increase up to 98% and 88% respectably but majority of students had little knowledge about other mosquito transmitted disease like filarial, chikungunya, Japanese Encephalitis (JE) after educational intervention.

Surprisingly about majority of students (82%) had wrong knowledge that dengue mosquito breeds in dirty water in pre intervention survey after applying in educational method that right knowledge (breeds in clean water) increase up to 78%, only 23% know that dengue caused by Aedes mosquito in pre intervention survey and 90% know that dengue caused by Aedes mosquito in post intervention survey. 25% responded answer about identify the dengue mosquito in pre intervention and that knowledge increase up to 74% after educational intervention, The *Aedes aegypti* mosquito typically bites during the day.

Table 2: Knowledge regarding mosquito borne diseases (n=100).

| Variable | | Frequency (%) |
|---|----------------------|---------------|
| Heard about dengue | Yes | 100 |
| | Radio | 7 |
| | Television | 11 |
| | Newspaper | 43 |
| Course of information about donors | Friends/relatives | 22 |
| Source of information about dengue | Public announcements | 7 |
| | Health professional | 19 |
| | Neighbour | 10 |
| | Teacher | 31 |
| | Printed media | 13 |
| Fever in last month in your family member or yourself | Yes | 24 |
| Seen/heard government initiatives for control spraying, | Yes | 77 |
| You and your family member(s) experienced from dengue fever | Yes | 8 |

In this study, large number of respondents doesn't know the biting time of the mosquito. Nearly 17% knew the biting time of dengue mosquitoes in pre intervention survey and 78% responded correctly aware Aedes mosquito mainly bites during day time after the post teaching survey, 56% students were aware the dengue occurs mostly in rainy season in pre intervention survey that awareness increase up to 82% (Table 3).

Regarding dengue symptoms, 46% students had knowledge of fever while other symptoms such as fatigue or malaise (28%), chills or rigors and joint pain (14%), nausea/vomiting and rash (10%) in pre intervention survey while in post intervention survey their knowledge were found significance improvement in all signs and symptoms, this study shows that students had very little knowledge about danger sign of dengue infection but post intervention survey significance increase knowledge, we were also found significance increase knowledge about step taken during dengue fever and preference to seek treatment for dengue infection for government hospital other than such as home remedy, traditional healers, self-medication and no treatment required (Table 4).

In this study shows that respondents were aware of measures prevent dengue fever transmission during the outbreak for protect themselves against contact with mosquitoes through cover tightly all water containers (52%), keep drain free from blockage and covering body with clothes/wearing full sleeve shirts (46%), use mosquito repellent and mosquito net when sleeping (40%), remove water from cooler (37%) and others methods in pre educational intervention but significance increase knowledge their knowledge after post intervention survey.

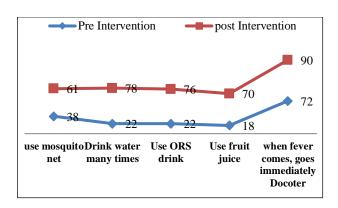


Figure 1: Step taken during dengue.

Most respondents were aware on preventive measures for mosquito breeding site through keeping surrounding clean (56%), removal of artificial collection of water from premises, proper drainage (38%), source reduction activities (32%), spraying chemicals on water (30%), fogging activities (14%) and 8% respondents answered don't know about any preventive measures for mosquito breeding site while post intervention survey were shows significant change their knowledge about preventive measures for mosquito breeding site (Table 5).

Majority of the participants in the study considered dengue to be a serious but preventable disease,50% considered need for treatment and hospitalization in pre intervention survey but post intervention survey significant change their attitude about dengue fever is a serious disease, dengue fever can be prevented, Need for treatment and hospitalization, environmental modification a need for dengue control, neighborhood is a dengue fever high-risk area (Table 6).

Table 3: Knowledge regarding dengue infection and vector (n=100) (pre-intervention and post-intervention).

| | Variable | Pre intervention (%) | Post intervention (%) | P value |
|---|--------------|----------------------|-----------------------|----------|
| Dengue is caused by | Virus | 55 | 91 | 0.00001 |
| Is dengue transmissible/ communicable disease | Yes | 33 | 75 | 0.00001 |
| Is treatment available | Yes | 74 | 76 | 743971* |
| How is dengue fever transmitted to a person | Mosquitoes | 87 | 100 | 0.000192 |
| Is linked with water collection | Yes | 81 | 98 | 0.000224 |
| | Dengue | 58 | 88 | |
| Mosquitoes transmitted disease name | Malaria | 56 | 90 | 0.00001 |
| | Filaria | 00 | 04 | 0.00001 |
| | Chikungunya | 00 | 03 | |
| | Dirty | 82 | 19 | |
| Type of water dengue mosquito breeds in | Clean | 11 | 78 | 0.00001 |
| | Don't know | 7 | 3 | |
| Name of the mosquito transmitting dengue | Aedes | 23 | 90 | 0.00001 |
| Can you identify the dengue mosquito | Yes | 25 | 74 | 0.00001 |
| Dengue mosquito bites time mostly | Day | 10 | 78 | 0.00001 |
| Season in which dengue occurs | Rainy season | 56 | 82 | 000132 |

^{*}Not significant p value.

Table 4: Knowledge on health seeking behavior against dengue fever (n=100) (pre-intervention and post-intervention).

| | | Pre intervention | Post intervention | P value |
|----------------------|--------------------------------------|------------------|-------------------|----------|
| | | (%) | (%) | |
| | Fever | 46 | 96 | 0.00001 |
| | Chills or rigors | 14 | 63 | 0.00001 |
| | Fatigue or malaise | 28 | 68 | 0.00001 |
| | Nausea /vomiting | 10 | 58 | 0.00001 |
| | Headache | 04 | 68 | 0.00001 |
| A) What are the | Joint pain | 14 | 72 | 0.00001 |
| signs and symptoms | Muscle weakness/ pain arthritis | 06 | 50 | 0.00001 |
| of dengue fever | Pain behind the eye | 02 | 18 | 0 .0004 |
| of deligue level | Rash | 10 | 24 | 0.01439 |
| | diarrhoea | 03 | 06 | 0.49511* |
| | Stomach pain | 06 | 24 | 0.00211 |
| | Bone sore | 04 | 34 | 0.00001 |
| | Gum bleeding | 02 | 40 | 0.00001 |
| | Leucopoenia | 02 | 42 | 0.00001 |
| | Blood in mouth | 2 | 66 | 0.00001 |
| | Blood in nose | 2 | 56 | 0.00001 |
| | Blood in gums | 4 | 60 | 0.00001 |
| B) What is danger | Blood with vomiting | 7 | 42 | 0.00001 |
| sign of dengue fever | Severe abdominal pain | 32 | 60 | 0.000128 |
| | Continue vomiting | 12 | 40 | 0.00001 |
| | Difficulty in breathing | 44 | 46 | 0.88697* |
| | Don't know | 18 | 00 | 0.000114 |
| | Use mosquito net | 38 | 61 | 0.00186 |
| C) 1771 | Drink water many times | 22 | 78 | 0.00001 |
| C) What step taken | Use oral rehydration solutions drink | 22 | 76 | 0.00001 |
| during dengue fever | Use fruit juice | 18 | 70 | 0.00001 |
| | When fever comes, visit immediately | 70 | 00 | 0.00210 |
| | doctor | 72 | 90 | 0.00218 |
| | Government hospital | 58 | 88 | 0.00001 |
| D) What preference | Private hospital/clinic | 30 | 32 | 0.0771* |
| to seek treatment | Home remedy | 08 | 10 | 0.80484* |
| for dengue infection | Traditional healers | 08 | 03 | 0.21473* |
| | Self-medication | 00 | | |
| | No treatment is required | 00 | 00 | |

^{*}Not significant p value.

Post Intervention Pre Intervention 32 Cover tightly Bury unused Keep drain Adding Change water water from in trays under burn unused garbage that cooler the fridge containers can accumulate defective repellent and body with floor surfaces mosquito net clothes / that can when sleeping Wearing full free from blockage larvacide in in plant container all water tyres water from water containers flower pot trays water into closed bin collect water, if any

Figure 2: Improvement observed in knowledge regarding methods of prevention of transmission of dengue.

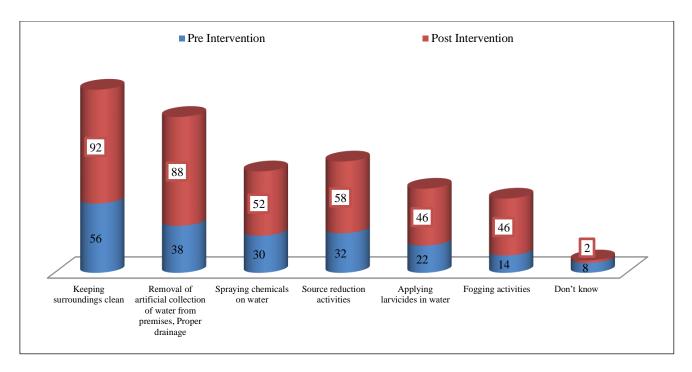


Figure 3: Improvement observed in knowledge regarding preventive measures for mosquito breeding site.

Table 5: Knowledge on preventive measures for dengue fever transmission and mosquito breeding site (n=100) (pre-intervention and post-intervention).

| | | Pre intervention (%) | Post intervention (%) | p value |
|---|--|----------------------------|-----------------------|-----------|
| | Cover tightly all water containers | 52 | 88 | 0.00001 |
| | Bury unused tyres | 22 | 58 | 0.00001 |
| | Keep drain free from blockage | 46 | 84 | 0.00001 |
| | Adding larvacide in water containers | 32 | 62 | 0.00004 |
| | Change water in plant container | 16 | 58 | 0.00001 |
| | Remove water from flowerpot trays | 22 | 66 | 0.00001 |
| | Remove water from cooler | 37 | 78 | 0.00001. |
| A) What steps taken to prevent dengue fever | Change water in trays under the fridge | 22 | 46 | 0.000596 |
| transmission during the | Destroy / burn unused containers | 24 | 56 | 0.00001 |
| outbreak | Place all garbage that can accumulate water into closed bin | 28 | 54 | 0.000325 |
| | Level defective floor surfaces that can collect water, if any | 18 | 32 | 0.033763 |
| | Use mosquito repellent and mosquito net when sleeping | 40 | 82 | 0.00001 |
| | Covering body with clothes/ Wearing full sleeve shirts | 46 | 80 | 0.00001 |
| | Keeping surroundings clean | 56 | 92 | 0.00001 |
| | Removal of artificial collection of water from premises, Proper drainage | 38 | 88 | 0.00001 |
| B) Knowledge on preventive | Spraying chemicals on water | 30 | 52 | 0.002535 |
| measures for mosquito | Source reduction activities | 32 | 58 | 0.00038 |
| breeding site | Applying larvicides in water | 22 | 46 | 0.009346 |
| | Fogging activities | 14 | 46 | 0.026482 |
| | Don't know | 08 | 02 | 0.104757* |

^{*}Not significant p value.

| | Table 6: | Attitude towards | dengue (n=100) | (pre-intervention and | post-intervention). |
|--|----------|------------------|----------------|-----------------------|---------------------|
|--|----------|------------------|----------------|-----------------------|---------------------|

| | Variable | Pre intervention (%) | Post intervention (%) | P value |
|---|----------|----------------------|-----------------------|-----------|
| Dengue fever is a serious disease | Yes | 82 | 60 | 0.00106 |
| Dengue fever can be prevented | Yes | 72 | 92 | 0.000471 |
| Need for treatment and hospitalization | Yes | 50 | 78 | 0.00001 |
| Do you think you or your family is at risk of getting dengue? | Yes | 62 | 74 | 0.182446* |
| Your neighbourhood is a DF high-risk area | Yes | 52 | 70 | 0.01371 |
| Do you keep water containers covered? | Yes | 58 | 88 | 0.00001 |
| The government is doing their best to prevent DF | Yes | 74 | 84 | 0.118184* |
| Is environmental modification a need for dengue control | Yes | 73 | 86 | 0.035565 |

^{*}Not significant p value.

DISCUSSION

In the present study, almost all the participants had heard about dengue (100%). Similarly, another study from Delhi has shown a high awareness of dengue (98.8%).²¹ and Valantine et al study has shown 4% of the participants have never heard about dengue.²² Newspaper (43%) emerged as the major source of information on dengue in the present study. whereas 31% mentioned teacher, 22% mentioned friends/relatives, 13% printed media (banners) and 11% Television as a source of information. whereas a study from Delhi (61.1%), Puducherry (64.5%) Television emerged as the major source of information on dengue.^{21,22} In the study from Chandigarh, health professionals were identified as a major source of information (44.87%).²³ Dengue fever as a viral disease was known to 55% of School students in pretest, 91% of school students after posttest. Awareness regarding the availability of treatment for Dengue fever 74% of students in pretest and 76% of school students after posttest.

In the current study, about 87% of study participants are aware of the vector of dengue in pretest after teaching methods their awareness improved 100%. This finding is similar to the result of a study (90%) done by Valantine et al in Puducherry.²² Another study done in central India shows community awareness of 76.58% regarding mosquito bite as cause of dengue.⁴

In the study it was found that 56% and 58% students were aware of most common mosquito borne illness malaria and dengue in pretest but after posttest student mentioned malaria 90%, dengue 88% and less than 5% student mentioned filarial and chikungunya.

Surprisingly, about majority (82%) of respondents had wrong knowledge that dengue mosquito breeds in dirty water only 11% respondents had correct knowledge in pretest stage whereas posttest survey showed significant improvement their correct knowledge (78%). Malhotra et al found that 25.25% participants reported that

mosquito breeds on stagnant water/cooler/tyres.²³ Matta et al found that, 79.8 % respondents knew about breeding places of mosquitoes.²⁴

knowledge about the name of the mosquito transmitting Dengue was known to 23% of students in pretest while, 90% of school students in mentioned name of aedes mosquito after the applied various teaching methods. Only 10% know that aedes mosquito mainly bites during daytime in pretest similar. Malhotra et al found that nearly 4% knew the biting time of dengue mosquitoes.²³ The common symptoms of DF are high fever, severe headache, severe pain behind the eyes, joint pain, muscle and bone pain, rash, and mild bleeding. In this study it could indicate that people are not aware of specific signs and symptoms of dengue. Fever was the most common symptom known to the participants (46%). The knowledge for other symptoms was comparatively very less. Only 28% of the participants knew about fatigue or malaise, joint pain and chills or rigors (14%), rash and nausea vomiting (10%).

Other symptoms very less percentage. Valantine et al study has shown about half of study participants mentioned fever as the chief presenting symptom of Dengue.²² In a study conducted by Vector Control Research Centre, Puducherry in 2013, it was found out that 59% of participants mentioned fever as the most common presenting symptom of dengue.²⁵ In this study, posttest survey shown significant improvement their knowledge. In this study, 52% participants keep the all water containers at home covered with a lid in pretest survey after educational intervention this practice mentioned student up to 88%.²² Valantine et al found that 96% participants keep the water containers at home covered with a lid.

Covering body with clothes/ Wearing full sleeve shirts (46%) and mosquito net (40%) use was the most preferred personal prophylactic measure for prevention against mosquito bite in pretest survey whereas after educational intervention significant improvement knowledge all 13 step steps taken to prevent dengue fever

transmission. IEC activities need to highlight that the mosquito responsible for dengue is a day-bitter and, therefore, the community should use the above mentioned personal protective devices in day hours also.

In the present study, only 82% in pretest and 60% in posttest survey considered dengue as "serious" and lifethreatening disease. This attitude needs to be changed. IEC activities should highlight the serious impacts of dengue. This figure was comparable to study done in Pune by Singru et al found that only 76.2% in urban area and 66.1% in rural area considered dengue as "serious" and life-threatening disease. Majority of the participants (72%) in the study considered dengue to be a serious but preventable disease in pretest and significant change found their attitude in posttest survey. Similar finding Arora et al Delhi study. In pretest and significant change found their attitude in posttest survey.

In this study, 50% of study population considered dengue as a serious illness and felt need of treatment and hospitalization is necessary for adequate cure. In another study done in Maharashtra by Taksande, it was found that 94% of study participants felt the need for hospitalization for dengue treatment.⁴

CONCLUSION

The knowledge about dengue fever was good among students, attitudes towards to keep their surroundings was also good; however, it was found that the good knowledge and attitudes does not necessarily lead to good practice. Health education programme should be continued and intensified with emphasis on school, college students and young adults.

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