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Primary Care Provider Insight Toward Oral Cancer Screening in Jeddah, Saudi Arabia 2022

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Abstract

Background: Oral cancer is a growing public health threat affecting annually more than two million of the global population and the rates are increasing. Also, it is usually diagnosed in advanced stages and carries high morbidity and mortality rates. Proper knowledge of primary healthcare physicians, who usually are in the first line of facing the problem, is the most important factor for ensuring early diagnosis and management. Objectives: To assess the level of oral cancer knowledge, opinions, attitudes, and screening practices among primary care physicians working at primary care centers. Material and methods: An analytical cross-sectional study design was conducted in Jeddah city, Saudi Arabia among currently working Ministry of Health (MOH) primary healthcare (PHC) physicians throughout the study period; 2023-2024. A self-administered validated questionnaire was utilized for data collection. It consists of four main parts: Socio-demographic characteristics of physicians, knowledge, attitude, and practice related to oral cancer questions and statements. Results: The study included 199 physicians. Almost two-thirds (65.8%) were females. Approximately one-fifth (22.1%) were aged between 25 and 30 years and 17.1% were aged over 50 years. History of previous attending training courses in oral cancer screening was reported by 6.5 of the participants. Overall, the total knowledge score ranged between 2 and 14; out of a possible maximum of 15 while the attitude score ranged between 1 and 7; out of a possible maximum of 7, and practice score ranged between 0 and 3; out of a possible maximum of 3. The highest knowledge score was observed among physicians aged over 50 years (mean rank=126.59) whereas the lowest score was observed among those aged between 25 and 30 years (mean rank=81.65), p=0.036. Non-Saudi physicians were more knowledgeable about oral cancer than Saudis (mean ranks were 123.90 vs. 95.08), p=0.007. The highest knowledge score was observed among physicians whose experience in primary healthcare exceeded 10 years (mean rank=110.15) whereas the lowest score was observed among those whose experience was one year or less (mean rank=83.02), p=0.041. Physicians who reported previously attending training courses in oral cancer screening were more knowledgeable about oral cancer and its screening than their peers (mean ranks were 142.77 vs. 97.01), p=0.005. Conclusion: Knowledge of primary care physicians about the risk factors of oral cancer was quite accepted and also, and their attitude toward further training was encouraging. However, few of them had training courses in oral cancer screening and their overall practice regarding oral cancer was not appropriate in many aspects.

Keywords*: Oral cancer, Screening. Knowledge, Attitude, Practice, Primary care physicians.*

Introduction

Oral cancer represents a public health problem of global significance. Most oral cancers are diagnosed when clinical signs and/or symptoms are already present. At this point, about 70% of all cases are in an advanced clinical stage [1]. Inadequately trained health professionals are usually the main reason for the late diagnosis of oral cancer [2]. A previous study done in Kuwait showed that only a third of the health professionals included in the study usually reviewed the patients' oral cancer risk factors, although they expressed good knowledge regarding oral cancer [3].

According to the World Health Organization's classification of diseases and related health problems (2010), oral cancer refers to "malignant growths affecting the lips, oral cavity, oropharynx, nasopharynx, hypopharynx, and other associated areas" [4]. Approximately 70% of oral cancer cases are diagnosed in an advanced clinical stage [5]. Thus, early diagnosis of oral cancer improves treatment and cure rate prognosis as well as 5-year survival rate [6].

Oral cancer screening discovers cancer at early stages, even before symptoms appear, and is defined as "the presumptive identification of unrecognized disease in an apparently healthy, asymptomatic population by means of tests, examinations or other procedures that can be applied rapidly and easily to the target population [7]. Furthermore, screening is a low-cost method that decreases the national health burden [8]. The success of an oral cancer screening program depends on many factors. Among them, health professionals' practice is considered the cornerstone. Inadequately trained health professionals are usually the main reason for the late diagnosis of oral cancer [9].

Oral cancer is the sixth most common cancer in the world [10], with increasing in both of its incidence and mortality rates [11]. It is a public health concern widespread in developing countries, particularly in South Asia and its mortality rate is mainly dependent on the stage of the disease at admission [12].

Despite advances in the management of oral cancer, the 5-year survival rate is still low (about 50%) in most parts of the world [13]. Several factors are considered risk factors for oral cancer including smoking, drinking alcohol, genetic predisposition, exposure to ultraviolet (UV) radiation, chronic inflammation, human papillomavirus (HPV) or Candida infections, immunosuppression, and certain foods [14]. Among these factors, smoking and drinking alcohol are considered the main risk factors for developing malignancy in the oral cavity [15].

A total of 172,424 cancer cases were identified by the Saudi Cancer Registry throughout a period of 22 years (1994- 2015). Oral cancer represented 1.85% of total cancers (n=3184). Oral cancer means age-standardized rate was 2.9/100,000 persons: being 1.5 for females and 1.4 for males. Jazan had the highest incidence of oral cancer, however, Hail had the lowest one [16].

This study aims to assess the level of oral cancer knowledge, opinions, attitudes, and screening practices among primary care physicians working at primary care centers.

Material and methods

Study design:

An analytical cross-sectional study design was adopted.

Study area and settings:

This study was conducted in Jeddah city, which is the second-largest city in Saudi Arabia with a population of approximately 4,697,000 individuals according to the estimated 2021 census [17]. Inside Jeddah city, there are 48 primary health care (PHC) centers belonging to the Ministry of Health where the study was carried out.

Study population and selection criteria

Ministry of Health (MOH) PHC physicians (n=415) currently working throughout the study period; 2023-2024 in PHC centers, Jeddah city; males and females, all nationalities, and all

categories (resident, specialist, and consultant) were eligible for inclusion. Dentists, physicians who were on vacation, and those who were not working in the clinical field were excluded.

Sample size and sampling technique:

The sample size was calculated using Roasoft sample size calculator, with the assumptions that 415 physicians are eligible for inclusion during the period of data collection; at the confidence level of 95%, margins of errors of 5% and the expected knowledge regarding oral cancer and its screening of 43% among general practitioners, based on a recent study carried out in Riyadh (Saudi Arabia) [18], Accordingly, the minimal sample size required was 198 physicians representing approximately 47.7% of the total target population. Almost half (n=24) of the PHC centers belonging to the Ministry of Health in Jeddah city were chosen by simple random technique and all eligible physicians in the chosen centers were invited to participate in the study.

Data collection tool and technique:

A self-administered validated questionnaire was utilized for data collection. It consists of four main parts: The first part is the socio-demographic characteristics of physicians (Gender, nationality, age, highest qualification, experience in PHC practice, previous attending training courses in oral cancer screening). Second part: Includes 15 items, with yes/no responses exploring PHC physicians` knowledge regarding oral cancer and its screening. Correct answers were assigned a score of 1: whereas incorrect or don't know answers were assigned a score of "o". A total score was computed for each participant and utilized for comparisons. The third part: includes 7 items with yes/ no responses to assess the attitude of physicians towards oral cancer and its screening and the total score was computed in the way that the higher the score, the more positive the attitude towards oral cancer screening and vice versa. Fourth part: Includes 5 items to assess the practice of the physicians concerning oral cancer screening with Yes/no responses and multiple-choice responses and total score was computed in the way that the higher the score, the better the practice regarding oral cancer screening and vice versa.

The questionnaire was adopted from a similar recent study carried out in Riyadh by Kazmi et al. [18] Permission to use the questionnaire was obtained through an e-mail communication with the corresponding author.

Data entry and analysis:

All collected data were verified and coded before they entered a personal computer. Data entry and analysis were done by using the Statistical Package of the Social Sciences (SPSS) statistical program version 28. Normality of the total scores of knowledge, attitudes, and practice (KAP) score were tested using the Shapiro-Wilk test. Since the scores were abnormally distributed, non-parametric statistical tests were adopted. Mann-Whitney was used to compare two groups whereas the Kruskal-Walli's test was used to compare more than two groups and a p-value of less than 0.05 was considered as a level of significance throughout the study.

Ethical consideration:

Approval of the research and ethics committee of the Joint Program of Family Medicine in Jeddah (Institutional Review Board) was obtained before conducting the study. Also, written permission from the Ministry of Health (MOH) higher authorities in Jeddah city was requested.

Results

The study included 199 physicians. Their demographic and work-related characteristics are summarized in Table 1. Almost two-thirds (65.8%) were females. Approximately one-fifth (22.1%) were aged between 25 and 30 years and 17.1% were aged over 50 years. The majority of the participants (82.9%) were Saudi and 67.8% were family physicians. Years of experience in primary healthcare exceeded 10 years in 38.7% of physicians whereas it was one year or less in 13.1% of them.

History of previous attending training courses in oral cancer screening was reported by 6.5 of the participants as illustrated in Figure 1.

From Table 2, the majority of the participants knew correctly that tobacco and alcohol are not the only etiological factors for oral cancer (88.9%), thought that a combination of smoking and alcohol consumption is more harmful than when a habit is present alone (82.4%), early detection improves 5-year survival rates in oral cancer (72.4%) and he early oral cancer lesions are not always symptomatic (71.4%). On the other hand, less than half of them could recognize that the most important characteristic of oral cancer metastasis is a hard painless fixed lymph node (49.7%), oral cancer is not a hereditary disease (47.7%), the lateral border of the tongue is the most common site for oral cancer occurrence (41.7%), lesions associated with smokeless tobacco are generally resolved after discontinuation of these products (31.7%), aware of the investigative procedures done for the early detection of oral cancer (29.1%) and think that most oral cancers cannot be diagnosed in early stage (29.1%).

Overall, the total knowledge score ranged between 2 and 14; out of a possible maximum of 15, It is abnormally distributed as the p-value of the Shapiro-Wilk test was <0.001. Its median value was 9 and interquartile range (IQR) was 6-10.

The highest knowledge score was observed among physicians aged over 50 years (mean rank=126.59) whereas the lowest score was observed among those aged between 25 and 30 years (mean rank=81.65), p=0.036. Non-Saudi physicians were more knowledgeable about oral cancer than Saudis (mean ranks were 123.90 vs. 95.08), p=0.007. The highest knowledge score was observed among physicians whose experience in primary healthcare exceeded 10 years (mean rank=110.15) whereas the lowest score was observed among those whose experience was one year or less (mean rank=83.02), p=0.041. Physicians who reported previously attending training courses in oral cancer screening were more knowledgeable about oral cancer and its screening than their peers (mean ranks were 142.77 vs. 97.01), p=0.005. Physicians` gender and job category were not significantly associated with physicians` knowledge. Table 3

Less than half (42.7%) of the participants agreed that annual oral cancer examinations should be provided for those of 40 years of age and above. Only 35.2% felt that they were adequately trained to provide alcohol cessation education while 77.9% felt adequately trained to perform patient's lymph node palpation. Only 26.1% felt having sufficient knowledge concerning the prevention and detection of oral cancer while 82.4% would like to have more information or training on oral cancer. The majority of physicians (94.5%) believed that patients with suspected oral cancerous lesions should be referred to a specialist and it is not a waste of time to educate the patients to quit their habits as they always decline to follow (87.4%). Table 4

Overall, the total attitude score ranged between 1 and 7; out of a possible maximum of 7, It is abnormally distributed as the p-value of the Shapiro-Wilk test was <0.001. Its median value was 5 and interquartile range (IQR) was 4-5.

None of the studied factors (physicians` age, gender, nationality, job category, experience in primary healthcare, and attending training courses in oral cancer screening) was significantly associated with their attitude towards oral cancer screening. Table 5

Only 23.6% of the participants reported routine examination of the patient's oral mucosa and among those who responded no, 50% reported screening of the oral mucosa for high-risk categories patients. However, the majority of them (84.9%) reported recording tobacco and alcohol use in their personal history. Also, only 30.2% of them practiced complete oral cavity examination besides palpating lymph nodes routinely on patients. Regarding the place of referral of patients with suspected oral malignancy, oral and maxillofacial surgery ranked first (57.8%), followed by otolaryngology (22.1%). Table 5

Overall, the total practice score ranged between 0 and 3; out of a possible maximum of 3, It is

abnormally distributed as the p-value of the Shapiro-Wilk test was <0.001. Its median value was 2 and interquartile range (IQR) was 1-2. Table 6

None of the studied factors (physicians` age, gender, nationality, job category, experience in primary healthcare, and attending training courses in oral cancer screening) was significantly associated with their oral cancer-related practice. Table 7

There was no significant correlation between knowledge and attitude score from one side and practice score from the other side as clear from Table 8.

Table 1: Demographic and work-related characteristics of the participants

Variables	Frequency	Percentage
Gender		
Male	68	34.2
Female	131	65.8
Age (years)		
25-30	44	22.1
31-35	43	21.6
36-40	35	17.6
41-45	17	8.5
46-50	26	13.1
>50	34	17.1
Nationality		
Saudi	165	82.9
Non-Saudi	34	17.1
Job category		
General practitioner	35	17.6
Family physician	135	67.8
Other specialties	29	14.6
Years of experience at primary healthcare		
≤1	26	13.1
2-5	49	24.6
6-10	47	23.6
>10	77	38.7

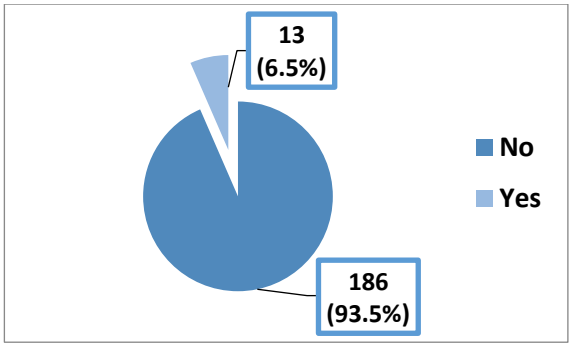

Figure 1: History of previous attending training courses in oral cancer screening among the participants

Table 2: Responses of the participants to knowledge questions/statements regarding oral cancer and its screening

Knowledge questions/statements	Correct answeres		
	Response	No.	%
Are you aware about oral cancer?	Yes	106	53.3
Do you know the various risk factors for oral cancer?	Yes	113	56.8
Are tobacco and alcohol the only etiological factors for oral cancer?	No	177	88.9
Do you think that combination of smoking and alcohol consumption is more harmful than when a habit is present alone?	Yes	164	82.4
Do you know the symptoms of oral cancer?	Yes	112	56.3
Do you think that the early oral cancer lesions are always symptomatic?	No	142	71.4
Do you think that the lateral border of tongue is the most common site for oral	Yes	83	41.7

cancer occurrence?			
Do you think that most oral cancers cannot be diagnosed in early stage?	Yes	58	29.1
Oral cancer is a hereditary disease.	No	95	47.7
Does the risk of oral cancer increase with age?	Yes	128	67.3
Do you know about the investigative procedures done for the early detection of oral cancer?	Yes	58	29.1
Is oral cancer a preventable disease?	Yes	111	55.8
Lesions associated with smokeless tobacco generally resolve after discontinuation of these products.	Yes	63	31.7
The most important characteristic of oral cancer metastasis is a hard painless fixed lymph node	Yes	99	49.7
Early detection improves 5-year survival rates in oral cancer	Yes	144	72.4

Table 3: Factors associated with knowledge of the participants about oral cancer and its screening

Variables	**Total knowledge score**			**p-value**
	Median	IQR	Mean rank	
Gender				
Male	8	6.25-10	97.68	
Female	9	6-10	101.2	0.680*
Age (years)				
25-30	8	5-9	81.65	
31-35	8	7-10	99.80	
36-40	8	6-11	98.93	
41-45	8	6-10.5	100.06	
46-50	9	6-10	98.02	
>50	10	8-11	126.59	0.036**
Nationality				
Saudi	8	6-10	95.08	
Non-Saudi	10	8-11	123.90	0.007*
Job category				
General practitioner	9	6-11	109.09	
Family physician	8	6-10	94.63	
Other specialties	10	7.5-10.5	114.02	0.148**
Years of experience at primary healthcare				
≤1	8	5-10	83.02	
2-5	8	6-9	86.33	
6-10	9	7-11	107.02	
>10	10	6.5-11	110.15	0.041**
previous attending training courses in oral cancer				
	8	6-10	97.01	

screening No Yes	10	9.5-13	142.77	0.005*

*Mann-Whitney test

**Kruskal-Wallis test

Table 4: Responses of the participants to attitude questions/statements regarding oral cancer screening

Attitude questions/statements	Yes N (%)	No N (%)
Annual oral cancer examinations should be provided for those of 40 years of age and above?	85 (42.7)	114 (57.3)
Do you feel that you are adequately trained to provide alcohol cessation education?	70 (35.2)	129 (64.8)
Are you adequately trained to perform patient's lymph node palpation?	155 (77.9)	44 (22.1)
Would you like more information or training on oral cancer?	164 (82.4)	35 (17.6)
Do you feel that you have sufficient knowledge concerning prevention and detection of oral cancer?	52 (26.1)	147 (73.9)
It is a waste of time to educate the patients to quit their habits as they always decline to follow	25 (12.6)	174 (87.4)
Patients with suspected oral cancerous lesions should be referred to a specialist	188 (94.5)	11 (5.5)

Table 5: Factors associated with attitude of the participants towards oral cancer screening

Variables	**Total attitude score**			**p-value**
	Median	IQR	Mean rank	
Gender				
Male	5	4-5	103.81	
Female	4	4-5	98.02	0.489*
Age (years)				
25-30	5	4-5.75	102.93	
31-35	5	4-5	99.83	
36-40	4	4-5	97.54	
41-45	5	3-5	97.97	
46-50	5	4-6	112.10	0.797**
>50	4	4-5	90.72	
Nationality				
Saudi	5	4-5	99.48	
Non-Saudi	5	3-6	102.50	0.775*
Job category				
General practitioner	5	4-6	107.23	
Family physician	5	4-5	98.97	
Other specialties	5	3-5	96.09	0.680**
Years of experience at primary healthcare				
≤1	5	4-5	101.33	
2-5	5	4-6	111.96	
	4	4-5		0.330*

6-10 >10	4	4-5	92.23 96.68	*
previous attending training courses in oral cancer screening No Yes	5 4	4-5 4-5	100.28 95.92	0.786*

*Mann-Whitney test

**Kruskal-Wallis test

Table 6: Responses of the participants to oral cancer-related practice

Practice questions/statements	Yes N (%)	No N (%)
Do you examine patients' oral mucosa routinely?	47 (23.6)	152 (76.4)
If your answer is No to the above question, do you screen the oral mucosa if the patients are in high-risk categories? (n=152)	76 (50.0)	76 (50.0)
Do you record tobacco and alcohol use in personal history?	169 (84.9)	30 (15.1)
Do you practice complete oral cavity examination besides palpating lymph nodes routinely on patients?	60 (30.2)	139 (69.8)
Where would you refer a patient if you suspected an oral malignancy? Otolaryngeology Oral and maxillofacial surgery Oral Medicine	 44 115 17 20	 22.1 57.8 8.5 10.1
Dentist Other	3	1.5

Table 7: Factors associated with oral cancer-related practice among the participants

Variables	**Total practice score**			**p-value**
	Median	IQR	Mean rank	
Gender Male Female	 2 2	 1-2 1-2	 105.33 97.23	0.322*
Age (years) 25-30 31-35 36-40 41-45 46-50 >50	2 2 2 2 2 1.5	1-2 1-2 1-3 1-3 1-2 1-2	100.45 95.09 112.61 105.76 102.62 87.75	0.526**
Nationality Saudi Non-Saudi	 2 2	 1-2 1-3	 97.98 109.79	0.252*
Job category General practitioner Family physician Other specialties	2 2 2	1-3 1-2 1-3	109.40 98.43 95.95	0.521**

Years of experience at primary healthcare ≤1 2-5 6-10 >10	2 2 2 2	1-2 1-2.5 1-3 1-2.5	88.56 103.65 101.24 100.78	0.706**
previous attending training courses in oral cancer screening No Yes	2 1	1-2 0.5-2.5	101.15 83.54	0.262*

Table 8: Corelation between knowledhe and attitide score with oralcancer-related practice score

	Knowledge score	**Attitude score**
Practice score r p	-0.033 0.642	-0.016 0.822

r: Spearman`s correlation coefficient

Discussion

Assessing KAP is one of the preferred ways to investigate the healthcare delivery process by defining areas of deficient knowledge and inappropriate practice and consequently helping in educational intervention [19].

In the Kingdom of Saudi Arabia, the prevalence of oral cancer is increasing, and it presents about 26% of all head and neck cancers; furthermore, the majority of cases were discovered in the late stages of the disease, despite the fact that it is one of the most preventable cancers through avoiding of its risk factors, particularly smoking and alcohol intake [20, 21].

It has been well documented that early discovery of oral cancer would reduce both morbidity and mortality of the disease [22]. Familiarity of primary care physicians with early clinical presentation of the disease and its risk factors is vital in this regard. Therefore, the present study was conducted to explore the KAP of primary care physicians regarding different aspects of oral cancer, particularly its screening, risk factors, and referral pattern.

The present study showed that the knowledge of the PHC physicians was sufficient in some aspects such as the fact that tobacco and alcohol are not the only etiological factors for oral cancer, the combination of smoking and alcohol consumption is more harmful than when a habit is present alone, early detection improves 5-year survival rates in oral cancer and the early oral cancer lesions are not always symptomatic. However, deficient knowledge was observed regarding the fact that the most important characteristic of oral cancer metastasis is a hard painless fixed lymph node, oral cancer is not a hereditary disease, and the lateral border of the tongue is the most common site for oral cancer occurrence, lesions associated with smokeless tobacco are generally resolved after discontinuation of these product, not aware of the investigative procedures done for the early detection of oral cancer and the fact that most oral cancers cannot be diagnosed in early stage. Several studies have demonstrated sufficient knowledge of the primary care physicians regarding the role of tobacco and alcohol as important risk factors for oral cancer [3, 19, 23-30]

The attitude of the PHC physicians towards oral cancer screening was favorable in some aspects such as the majority of them felt adequately trained to perform patient's lymph node palpation, would like to have more information or training on oral cancer, believed that patients with suspected oral cancerous lesions should be referred to a specialist and it

is not a waste of time to educate the patients to quit their habits as they always decline to follow. However, their attitude was negative in some other aspects as only less than half of them agreed that annual oral cancer examinations should be provided for those of 40 years of age and above, 35.2% felt that they were adequately trained to provide alcohol cessation education and only 26.1% felt having sufficient knowledge concerning prevention and detection of oral cancer. These findings suggest that there is a need to train PHC physicians on the importance of performing oral cancer screening. In a recent systematic review and meta-analysis study, 56% of medical practitioners expressed a positive attitude toward oral cancer screening [19]. In the United States (2018), Shimpi et al observed that more than half of primary healthcare providers reported limited training in oral cancer screening [31]. However, in another older US study, 61 % of physicians reported being adequately trained in examining oral cancer patients [32].

The practice of the PHC physicians in the present study was overall unsatisfactory as only 23.6% of them reported routine examination of the patient's oral mucosa and among those who responded no, 50% reported screening of the oral mucosa for high-risk categories` patients and also only 30.2% practiced complete oral cavity examination besides palpating lymph nodes routinely on patients. However, some encouraging practices in this regard were reported as 84.9% of them reported recording tobacco and alcohol use in their personal history. These findings support the need to incorporate oral cancer screening into PHC physicians` practices. Defective oral cancer screening and referral practice was also reported in a systematic review and meta-analysis conducted by Coppola et al (2021) [19].

Interestingly in the present study, only 6.5% of the participants reported previously attending training courses in oral cancer screening; furthermore, this was not associated with a more positive attitude and more appropriate practice despite it being associated with having better knowledge about the disease. This will raise a question about the quality of such training courses and the gap between knowledge from one side and both attitude and practice from the other side.

The study has some important limitations that should be addressed. First of all, its conduction in one city could impact the ability to generalize findings over other cities. However, Jeddah is the second largest city in the Kingdom of Saudi Arabia. Second, using a self-administered tool is subjected to bias of over or under-estimation of responses. Finally, the cross-sectional design of the study doesn`t consider the temporal relationship between dependent and independent variables as they were investigated at the same time. Despite those limitations, the study could be important to decision-makers to be more aware of the importance of improving the KAP of primary care physicians regarding oral cancer screening.

Conclusion

Knowledge of primary care physicians about risk factors of oral cancer was quite accepted and also, their attitude towards further training was encouraging. However, few of them had training courses in oral cancer screening and their overall practice regarding oral cancer was not appropriate in many aspects. Based on these findings, organizing regular educational activities for primary care physicians regarding oral cancer and its screening is highly needed. In addition, a further nationwide study is recommended to include primary healthcare physicians from as many cities as the Kingdom of Saudi Arabia to have a clearer profile of the situation.

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