Medical Students' Awareness of Smell Loss as a Predictor for Coronavirus Disease 2019

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Background: Anosmia has been reported as an early presentation of coronavirus disease 2019 (COVID-19). However, the pathophysiological mechanism of olfactory dysfunction is still unclear.

Aim: The aim of this study to evaluate the knowledge regarding common symptoms, anosmia, treatment options, and PPE among medical students in three different universities of Saudi Arabia.

Methods: This cross-sectional survey conducted among medical students in Saudi Arabia. Google Forms was used to create the survey. The questionnaire included demographic information, knowledge of COVID-19 symptoms, sources of information, and the level of awareness of specific symptoms (loss of smell and taste).

Results: A total of 494 students completed the questionnaire. The majority of the participants were aware of common COVID-19 symptoms like fever and cough (79.8 and 67.2%, respectively), but less than half were aware that smell or taste dysfunction might be a symptom of COVID-19 (44.3 and 30.2%, respectively). The present study revealed that the source of information also plays a critical role in medical students' awareness regarding the symptoms of COVID-19. Students using international organization's websites, medical databases, or published research had better knowledge of anosmia as a COVID-19 symptom compared to those who used WhatsApp, Google, or unofficial social media pages. In our study, a minority (11.9%) of the participants relied on unofficial social media pages as the main source of their information.

Conclusion: Saudi medical students understand that smell or taste dysfunction can be a potential symptom of COVID-19, but this knowledge was not as widespread as the knowledge regarding the most common COVID-19 symptoms.

Keywords: COVID-19, smell loss, coronavirus, anosmia, medical student

INTRODUCTION

Near the end of 2019, cases of atypical pneumonia of unknown etiology were discovered in Wuhan in the mainland of China. Later on, these cases proved to be linked to a viral infection caused by a novel virus of the coronavirus family; the International Committee on Taxonomy of Viruses had named it severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (1). The infection spread,

TABLE 3 | Gender comparison using *t*-test/Mann-Whitney *U*-test.

	Female			Male			*t/U*	*p*
	M	**SD**	**Me**	**M**	**SD**	**Me**		
Common symptoms	1.94	0.23	2.00	1.93	0.27	2.00	−0.49	0.622
Anosmia	5.02	2.28	5.00	5.08	2.36	5.00	0.24	0.812
PPE	3.67	1.85	5.00	3.08	1.97	3.00	23437.50	0.002
Treatment	1.09	1.35	0.00	1.32	1.46	1.00	25571.50	0.101

TABLE 4 | Frequencies for symptoms and triple index categorization in universities.

	Common symptoms index			Triple index		
	Poor	**mod.**	**Good**	**Poor**	**mod.**	**Good**
King Saud University	1 (1.2%)	8 (9.3%)	77 (89.5%)	65 (75.6%)	21 (24.4%)	0 (0%)
Prince Sattam Bin Abdulaziz University	0 (0%)	4 (4.8%)	79 (95.2%)	60 (72.3%)	17 (20.5%)	6 (7.2%)
Imam Muhammad ibn Saud University	0 (0%)	3 (8.1%)	34 (91.9%)	22 (59.5%)	11 (29.7%)	4 (10.8%)
King Saud bin Abdulaziz University for Health Sciences	0 (0%)	4 (6.5%)	58 (93.5%)	42 (67.7%)	17 (27.4%)	3 (4.8%)
Al Qassim University	0 (0%)	0 (0%)	56 (100%)	46 (82.1%)	10 (17.9%)	0 (0%)
King Khalid University	0 (0%)	8 (9.2%)	79 (90.8%)	66 (75.9%)	20 (23.0%)	1 (1.1%)
King Abdulaziz University	0 (0%)	3 (4.9%)	58 (95.1%)	50 (82.0%)	9 (14.8%)	2 (3.3%)
Other	0 (0%)	0 (0%)	22 (100%)	15 (68.2%)	6 (27.3%)	1 (4.5%)

those with little (M = 2.51, SD = 2.24, Me = 2.00; *p* = 0.004) and partial (M = 3.20, SD = 1.93, Me = 4.00; *p* = 0.024) knowledge. Finally, students who self-assessed as having complete knowledge of COVID-19 (M = 1.46, SD = 1.48, Me = 1.00) exhibited significantly higher knowledge of treatment in comparison to participants with self-assessed partial knowledge (M = 1.11, SD = 1.38, Me = 0.00; *p* = 0.041).

DISCUSSION

The current study aimed to determine the knowledge regarding COVID-19 common symptoms, anosmia (loss of sense of smell and taste), treatment options, and PPE among the medical students from three different universities. The findings revealed that majority of the participants had significant knowledge related to COVID-19 general symptom such as rise in body temperature, cough, and shortness of breath. However, only 35.6% participants were aware of anosmia (loss of sense of smell) as a specific symptom of corona disease. A viral infection is the most common cause of anosmia. Like other viruses, coronaviruses can result in anosmia in 10–15% of patients (14). COVID-19 infection differs from other coronaviruses in that the chemosensory dysfunction is more prevalent and is not associated with other rhinitis symptoms like nasal obstruction and rhinorrhea (11). There are growing evidence reported that loss of taste and smell is a strong predictor of COVID-19 infection (12). Having said that, in this study a 36.3% of participants did not know that change in taste or taste of eating as the symptom of the corona. One study reported that out of 6,452 confirmed COVID-19 cases, 64.76% experienced anosmia or ageusia (15). A possible pathogenesis for anosmia suggested

by Brann et al. (16) is that the COVID-19 virus affects the non-neuronal olfactory cells, causing loss of smell and associated taste alteration. Zhou et al. (17) confirmed that COVID-19 uses the cellular angiotensin-converting enzyme 2 receptor. Because this enzyme is distributed in the oral cavity, it is possible that the virus affects the taste function (17).

In terms of gender differences regarding the knowledge of symptoms, anosmia, treatment, and PPE. The findings revealed that female participants had significantly good knowledge (*p* = 0.020) on the use of PPE as compared to that male participants. However, there was no significant difference in the knowledge level of symptoms, anosmia and treatment between male and female participants. It contradicts the findings of a previously conducted study which states that showed that men had less knowledge of COVID-19 compared to women (18).

Overall, our study revealed that medical students in Saudi Arabia have good knowledge of common COVID-19 symptoms, regardless of their information source. The same finding was seen in two cross-sectional studies conducted in Jordan and Uganda, where the students showed a high level of knowledge (19, 20). The current study also revealed that no significant difference was seen when the knowledge was assessed based on college year or university affiliation. These findings might be explained by the awareness campaigns and education programs conducted by governments to target the whole community (18). Another factor that may explain these findings is the seriousness of the disease, especially after being declared a pandemic by the WHO (21).

Our findings show that the majority of the included participants were aware of common COVID-19 symptoms like fever and cough (79.8 and 67.2%, respectively), but less than half were aware that smell or taste dysfunction might be a symptom of