



## A STUDY ON MASK ASSOCIATED DRY EYE(MADE)

Dr G Mounika\*

Junior Resident, Dept of Ophthalmology, Kurnool Medical College. \*Corresponding Author

Dr.Latha M S

Assistant professor, Dept of Ophthalmology, Kurnool Medical College.

**ABSTRACT** During the COVID-19 pandemic, the widespread use of face masks was recommended as a key measure against the spread of SARS-CoV-2. A marked increase in dry eye symptoms among regular mask users was reported, but the prevalence of this condition has not been described in the literature yet. This observational, descriptive, and cross-sectional study aimed to measure self-reported symptoms of mask-associated dry eye in the people attending OPD and identify factors influencing this condition. **Methods:** A questionnaire was prepared and given to patients in opd who used masks regularly. **Results:** A total of 800 patients were analysed. Of them, 467 have symptoms, 333 (41.6%) reported their symptoms were exacerbated when wearing a mask. Thus 18.3 % of all participants experienced mask-associated dry eye. There was no significant association between perceived mask-associated dry eye and age, refractive correction, and pre-existing ocular discomfort. A positive correlation was observed in health care professionals and outdoor workers

**KEYWORDS :** Face mask, Dry eye, ocular Discomfort, COVID -19

## INTRODUCTION

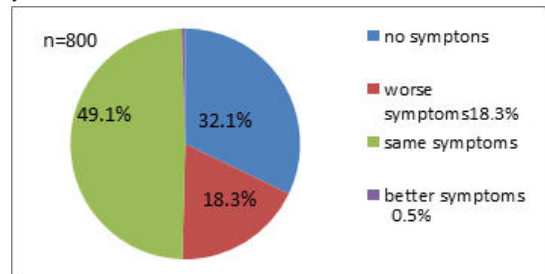
During the COVID-19 pandemic, the widespread use of face masks was recommended as a key measure against the spread of SARS-CoV-2 [1]. This has led to some concerns, with masks being perceived as uncomfortable, or inconvenient: prolonged use of masks has been associated with complaints of headache, difficulty in breathing, skin irritation, sweating, and fogged glasses [2,3]. The first anecdotal observations of mask-associated dry eye (MADE) date back to June 2020, when D.E. White, an American ophthalmologist, described this condition on his blog and coined the acronym "MADE" [4]. A recent review indicated a marked increase in dry eye symptoms among regular mask users [5], but the prevalence of these symptoms has not been reported. This observational, descriptive, and cross-sectional study aimed to measure self-reported symptoms of MADE in the general population and identify factors influencing this condition, such as age, sex, occupation, and the use of different refractive corrections (glasses or contact lenses).

**2. Method:** A prospective study was conducted from patients attending ophthalmology OPD. Participants were asked to respond about their age, sex, profession, and the frequency of dry eye symptoms (i.e. foreign body sensation, dryness, irritation, itching, or burning) [6]. For symptom frequency, participants could select: never, sometimes or often. Instead of using a structured questionnaire to disseminate the survey, the number of questions was minimised, and all symptoms were grouped into one single question [7]. If no symptoms were reported, no further survey questions were completed. Participants who reported symptoms of ocular discomfort were asked if these symptoms were better, worse, or stayed the same while wearing a face mask. Participants were also asked if they wore glasses or contact lenses. For this study, MADE was defined as the condition in which dry eye symptoms are present at least sometimes and become worse using a face mask. By this definition, both people who had symptoms only while wearing the face mask and people who had symptoms that became worse with the face mask were considered affected by MADE. Instead, people who had no symptoms and those who had symptoms but no worsening were considered not affected by MADE. slit lamp examination, and Schirmer's test was performed.

Descriptive statistics were used to summarise the results, and an Odds Ratio was calculated to quantify the magnitude of association using a 95 % Confidence Interval (CI) and P-value ( $< 0.05$ ). Demographic and descriptive variables achieving a P-value  $< 0.05$  in the univariate analyses were included in the stepwise logistic regression model. The final model was created to predict factors associated with perceived MADE.

**3. RESULTS:** A total of 800 were evaluated. The participants' age ranged from 11 to 88 years (median: 31; IQR: 25–47). About one-third of participants (32.1 %) never experienced dry eye symptoms, 54.3 % sometimes, and 13.6 % often. 579(72.3 %) did not notice any change, and 215 (26.9 %) said their symptoms got worse. Thus, 18.3 % of the entire sample experienced MADE. Fig. 1 summarises the changes in

ocular discomfort while wearing face masks. Participants who often had ocular discomfort were more likely to report a worsening of their condition while wearing a mask than participants who had symptoms only sometimes.



**Figure 1. Pie chart describing percentages of participants never having symptoms of ocular discomfort or experiencing better, same, or worse symptoms while wearing a face mask**

In this sample, age was neither associated with dry eye symptoms nor with symptoms worsening with masks. The sample consisted of 205 (25.6 %) females and 595 (74.4 %) males. Males were more likely to report ocular irritation symptoms and a worsening of dry eye symptoms due to wearing a face mask. The majority of participants usually wore glasses (60 %), 10.8 % wore contact lenses, and 29.2 % did not wear any correction. There were no statistically significant differences in ocular discomfort between participants who wore glasses or contact lenses, while those who wore no correction reported less frequent symptoms (. Likewise, there were no significant differences in perceived worsening of symptoms among participants who wore glasses or contact lenses, while those who wore no correction experienced MADE less frequently. Regarding occupation, there were no statistical differences in the prevalence of dry eye symptoms, while there were significant differences in the perceived worsening of symptoms while using a mask: outdoor workers, health care professionals most frequently reported MADE. Other professions, such as teachers, office employees, factory workers, students, and retirees, showed no statistically significant association with the dependent variable studied.

## 4. DISCUSSION

This study aimed to investigate self-reported symptoms of MADE in patients attending OPD. About two-thirds of the participants who responded to the survey had dry eye symptoms with some frequency, and of these, 26.7 % had increased symptoms with mask wear. This is the first study describing the prevalence of this condition. The prevalence of ocular discomfort was significantly higher in the present study than reported previously [8]. However, Chalmers et al. [7] observed that clinicians often underestimated the severity of participants self-assessment of dry eye. As face masks are necessary, along with social distancing and hygiene measures, to slow down the spread of COVID-19 [1], it is important not to underestimate all

symptoms that could discourage the population from using them. Although the results of this survey showed that most people report no change in ocular symptoms while wearing a face mask, a significant proportion of people with dry eye symptoms experienced exacerbated symptoms when wearing a face mask, and this problem can affect about 18 % of the general population. The majority of studies report a significantly higher prevalence of dry eye disease in men than women [8]: the present study results confirm these findings both for dry eye symptoms and for MADE. Although a higher prevalence of dry eye disease in older people is described in the literature, [9] in this sample, the worsening of symptoms due to the use of the mask was not correlated with age. Further studies are needed to confirm and explain this finding since few studies have investigated MADE, a temporary condition induced by an environmental change of a different aetiology to dry eye disease. Furthermore, perhaps older people wear masks for fewer hours than workers, but this point was not explored in the present study. In this sample, participants wearing glasses or contact lenses experienced dry eye symptoms more frequently than people without any correction, but there were no differences in self-reported MADE between correction type. Regarding occupation, outdoor workers report more MADE than other professions, such as healthcare workers, who may wear masks for more extended periods. However, other physiological and psychological factors may contribute to their perception of discomfort [3]. The present study results align with White's observation [4] that MADE was not more or less prevalent in any particular population. As dry eyes can make it difficult to perform everyday activities, eye care professionals should verify clinical signs in all patients complaining about MADE and suggest methods to mitigate this condition. Experts recommend that mask wearers experiencing dry eye symptoms should ensure that the mask is worn appropriately, apply lubricating drops, limit time in air-conditioned environments, and take regular breaks from digital devices [10]. Moreover, Matusiak et al. [2] documented that wearing surgical masks was linked to a significantly lower risk of adverse reactions than cloth mask or respirators (N95 + FFP). This is supported by Roberge et al. [11], who postulated that surgical mask use at a low-moderate work rate was not associated with clinically significant physiological impact. Still, it would be helpful to verify if the use of different types of masks may affect ocular discomfort.

## REFERENCES

- [1] World Health Organization. Advice on the use of masks in the context of COVID-19. 2020 (accessed 25 Oct 2020), <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks>.
- [2] Matusiak L, Szepietowska M, Krajewski P, et al. Inconveniences due to the use of face masks during the COVID-19 pandemic: a survey study of 876 young people. *Dermatol Ther* 2020;33:e13567. <https://doi.org/10.1111/dth.13567>.
- [3] Scheid JL, Lupien SP, Ford GS, et al. Commentary: physiological and psychological impact of face mask usage during the COVID-19 pandemic. *Int J Environ Res Public Health* 2020;17. <https://doi.org/10.3390/ijerph17186655>.
- [4] White DE. BLOG: MADE: a new coronavirus-associated eye disease. 2020. <https://www.healio.com/news/ophthalmology/20200622/blog-a-new-coronavirus-associated-eye-disease>.
- [5] Moshirfar M, West WB, Marx DP. Face mask-associated ocular irritation and dryness. *Ophthalmol Ther* 2020;1-4. <https://doi.org/10.1007/s40123-020-00282-6>.
- [6] Simpson TL, Situ P, Jones LW, et al. Dry eye symptoms assessed by four questionnaires. *Optom Vis Sci Off Publ Am Acad Optom* 2008;85:692-9. <https://doi.org/10.1097/OPX.0b013e318181ae36>.
- [7] Chalmers RL, Begley CG, Edrington T, et al. The agreement between self-assessment and clinician assessment of dry eye severity. *Cornea* 2005;24:804-10. <https://doi.org/10.1097/01.icc.0000154410.99691.3c>.
- [8] Stapleton F, Alves M, Bunya VY, et al. TFOS DEWS II epidemiology report. *Ocul Surf* 2017;15:334-65. <https://doi.org/10.1016/j.jtos.2017.05.003>.
- [9] de Paiva CS. Effects of aging in dry eye. *Int Ophthalmol Clin* 2017;57:47-64. <https://doi.org/10.1097/IIO.0000000000000170>.
- [10] Jones LW. Why face masks can make eyes feel dry, and what you can do about it. The Conversation; 2020 (accessed 24 Oct 2020), <http://theconversation.com/why-face-masks-can-make-eyes-feel-dry-and-what-you-can-do-about-it-143261>.
- [11] Roberge RJ, Kim J-H, Benson SM. Absence of consequential changes in physiological, thermal and subjective responses from wearing a surgical mask.