

Prevalence of Headache among N-95 Mask Users in COVID-19 Pandemic

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Abstract: Background: There has been an exceptional rise in the usage of personal protective equipment (PPE) by healthcare workers during the rapidly emerging coronavirus disease 2019 (COVID-19) pandemic. Even though these equipment offer a high level of protection to healthcare professionals in fighting infections like COVID-19, at the same time they cause physical discomfort, resulting in poor observance, especially when PPE is worn for prolonged duration. Method: A cross sectional survey was conducted at Krishna College of physiotherapy, Karad. A total of 100 medical students were included by random sampling method. Result: Data was analyzed using SPSS version 20. It was observed that students using N-95 masks had the highest percentage of headache (89%). Conclusion: Thus from the above conducted study it is concluded that headache is present among N-95 mask users.

Keywords: COVID-19 infection, Headache, N-95 mask, personal protective equipment, PPE, Severe Acute Respiratory Syndrome [SARS]

1. Introduction

There has been an exceptional rise in the usage of personal protective equipment (PPE) by Healthcare workers during the rapidly emerging coronavirus disease 2019 (COVID-19) pandemic.¹ Fundamentally, PPE consists of N95 respirator, protective eyewear, gown and gloves.¹ Even though these equipment offer a high level of protection to healthcare professionals in fighting infections like COVID-19, at the same time they cause physical discomfort, resulting in poor observance, especially when PPE is worn for prolonged duration.¹ It has been shown in the previous studies that there is a remarkable increase in headache among frontline healthcare workers who used PPE for prolonged hours during Severe Acute Respiratory Syndrome (SARS) and COVID-19 outbreak.¹ External compression of sensitive facial skin and superficial nerves by face mask and its tight straps could be a plausible explanation for occurrence of headache among PPE users, especially when used for longer duration.¹ Those who wear close-fitting N95 face-masks, headaches may have arisen in them due to pressure from the strap on the neck or back of the head over the superficial nerves, which may also exasperate an underlying cervical neck strain and intensify face-mask-associated headaches.² In ‘front-line’ work, the use of masks can be very extended.³ Problems such as general discomfort, decreased visual, auditory or vocal capacity; excessive heat or humidity; facial pressure; skin lesions; itching; fatigue; anxiety and claustrophobia are still reported even in highly effective masks. The current COVID-19 pandemic has caused a fundamental change in the productivity of health professionals.³ However, it seems that mask use reduces working speed and negatively influences levels of alertness and task focus.³ Biological changes in terms of increased respiratory resistances were observed after 3 hours of mask usage.³ The risk of progress of headache is higher among nurses and other health professionals as compared to other

physicians due to the different traits of the workers' occupation.³ It is important to encourage prevention and protection policies that ensure the safety of workers, without sabotaging their quality of life as the use of these devices will tend to become more extensive due to the consequence of the pandemic.³ The appearance of de-novo headaches has been shown to increase with mask use, nonetheless. This rate increases even more when both masks are used in combination. Bilateral, moderate, and pressing nature is the characteristics of a de-novo headache. This type of headache starts soon after putting on the mask and disappears after removing it. Shorter duty shifts and equitably shorter durations of personal protective equipment use may well be a good strategy to avoid the negative effects of using such equipment.⁴

2. Literature Survey

The study was carried out using a self-made questionnaire which was approved by the staff of Krishna College of Physiotherapy, KIMSUDU, Karad. A cross-sectional survey was conducted. A sample of 100 medical students were taken by random sampling and informed consent was taken. Data was collected via Google forms which were circulated among the students of Krishna College of Physiotherapy. The inclusion criteria were medical students who do not have a history of migraine. Exclusion criteria were non-medical professionals and age group below 18.

3. Materials and Methods

The study was carried out using a self-made questionnaire.

The questionnaire consisted of 15 questions with multiple choice and YES and NO type responses.

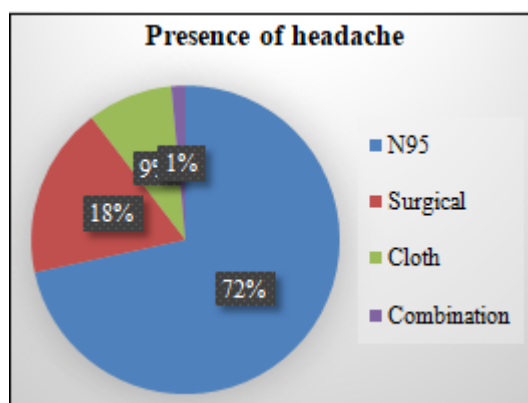
The questionnaire assessed (i) the type of mask worn (ii) duration (iii) if the subject suffers from headache (iv) if the subject suffers from migraine (v) if the subjects takes medicines for the same (vi) if wearing mask causes pain behind the ear (vii) is the pain frequent (viii) does the pain continue after removing the mask (ix) severity of the pain (x) does the pain radiate (xi) type of pain (xii) mask preference (xiii) what causes pain relief (xiv) skin rash (xv) Visual analog scale.

4. Results

1) Distribution according to headache due to different types of mask

Table 1: Headache wise distribution

Type of Mask	Presence of Headache	Percentage
N95	32	58.18%
Surgical	8	14.6%
Cloth	4	7.27%
Combination	11	20%
Total	55	100%

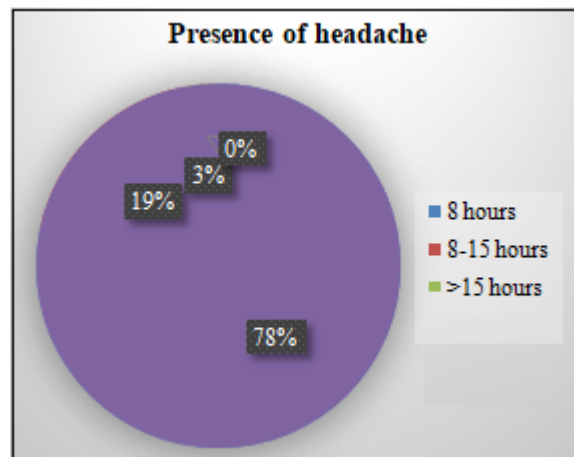


Graph 1: Presence of Headache

The Graph No.1 depicts that 32 students using N-95 masks have the highest percentage of headache that is, 58.18%, 8 students using surgical masks have 14.6% headache, 11 students using combination masks have 20% headache followed by 4 students using cloth mask, and experience 7.27%, that is the least headache.

2) Distribution according to duration of wearing N95 masks:

Duration	Presence of Headache	Percentage
8 hours	25	78.12%
8-15 hours	06	18.8%
More than 15 hours	01	3.1%
Total	32	100%

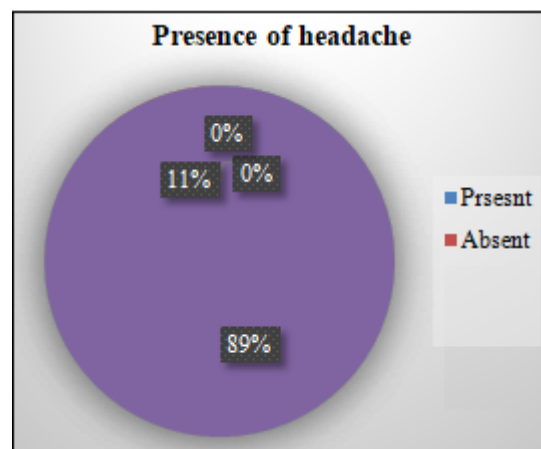


Graph 2: Presence of headache according to duration

Graph 2 depicts that 25 students who wear N95 mask for 8 hours experience more headache that is 78.12%. The second column shows that only 6 students wear the mask for 8-15 hours and experience 18.8% of headache. Only 1 student wears the mask for more than 15 hours and experiences 3.1 % headache.

3) Prevalence of Headache in N95 Mask Users

	Presence of Headache	Percentage
Present	32	89%
Absent	04	11%
Total	36	100%



Graph 3: Prevalence of Headache in N95 Mask Users

Graph 3 depicts that among the students who use N-95 masks, 32 of them experience headache whereas in only 4 students, headache is absent.

5. Discussion

The purpose of present study was to find prevalence of headache among N-95 mask users during COVID-19 pandemic. There has been an exceptional rise in the usage of personal protective equipment (PPE) by Health care workers during the rapidly emerging (COVID-19) pandemic. These equipments can cause physical discomfort, resulting in poor observance, especially when PPE is worn for prolonged duration.¹

It has been shown in the previous studies that there is a remarkable increase in headache among frontline healthcare workers who used PPE for prolonged hours during Severe Acute Respiratory Syndrome (SARS) and COVID-19 outbreak.¹ External compression of sensitive facial skin and superficial nerves by face mask and its tight straps could be a plausible explanation for occurrence of headache.¹ Those who wear close-fitting N95 face-masks, headaches may have arisen in them due to pressure from the strap on the neck or back of the head over the superficial nerves, which may also exasperate an underlying cervical neck strain and intensify face-mask-associated headaches.²

The current COVID-19 pandemic has caused a fundamental change in the productivity of health professionals.³ However, it seems that mask use reduces working speed and negatively influences levels of alertness and task focus.³

Graph/table No 1 depicts that 32 N-95 mask users experience 58.18% headache, 8 surgical mask users experience 14.6% headache, 4 cloth mask users experience 7.27% headache and 11 people who use combination of the above mask experience 20% headache.

Graph/table No 2 shows that 25 students who wear N95 mask for 8 hours experience more headache that is 78.12%. The second column shows that only 6 students wear the mask for 8-15 hours and experience 18.8% of headache. Only 1 student wears the mask for more than 15 hours and experiences 3.1 % headache.

Graph/table No 3 depicts that among the students who use N-95 masks, 32 of them experience headache whereas in only 4 students, headache is absent.

The risk of progress of headache is higher among nurses and other health professionals. It is important to encourage prevention and protection policies that ensure the safety of workers, without sabotaging their quality of life.³ The appearance of de-novo headaches has been shown to increase with mask use, nonetheless. Shorter duty shifts and equitably shorter durations of personal protective equipment use may well be a good strategy to avoid the negative effects of using such equipment.⁴

6. Conclusion

On the basis of the results of the study, it was concluded that prevalence of headache among N-95 mask users during COVID-19 pandemic was found to be 89%.

7. Future Scope

- 1) This study can be done on a larger population.
- 2) Adequate time should be given to screen the target population.
- 3) This study can be taken up for further studies so that the subjects can be thoroughly assessed and better solutions can be found for the problem assessed.

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