



CAN HEADACHE BE AN OBNOXIOUS SYMPTOM ASSOCIATED WITH EXTENDED N95 MASK USAGE AMONG FRONT LINE HEALTH CARE WORKERS.

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KEYWORDS :

INTRODUCTION:

The pandemic covid 19 necessitated that health care workers (HCW) wear masks of N(not resistant to oil) 95 (filtering out 95% of particulate matter) Grade, along with personal protective equipment (PPE) to prevent the spread of the contagion in society and to take care of themselves. HCWs are at the highest risk, coming in contact with the contagious aerosols/ droplets generated by infected patients. PPEs, more so N95 masks, are used as barriers to prevent cross infection and ensure the safety of patients as well as HCWs. Many of the health care workers complain of headaches as well as problems like breathlessness and even acne and fogging of spectacles with extended usage of N95 grade masks.

OBJECTIVE:

- To find a definitive association between headaches and N95 mask usage among Front line healthcare workers
- To assess the most common adverse consequences of such usage

MATERIAL AND METHODS:

The study is to find any causal association between headaches as well as other unwanted effects linked to the usage of N95 grade masks and any correlation with duration of usage as well. This is a questionnaire based observational study. The questions are framed to evaluate variables like age, gender, type and duration of mask usage, previous history of headache, relieving factors and any other problems associated with the N95 grade mask usage. This was provided to Front line healthcare workers working at RLJH Hospital before the second covid wave. Hypoxemia, hypercapnia, stress associated with its usage for longer time have been suspected to be the triggers for headaches.

INCLUSION CRITERIA:

All Front line health care workers using N95 grade masks routinely in the course of discharge of duties will be included

EXCLUSION CRITERIA:

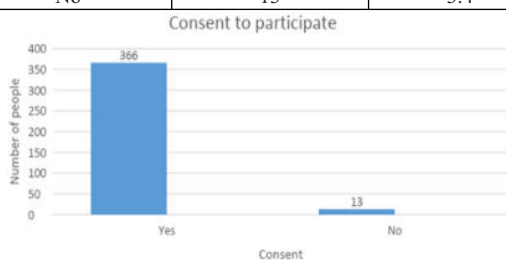
Age less than 20 years and pregnancy.

RESULTS:

Out of the 379 health care workers approached, 366 HCW gave consent to participate in the study.

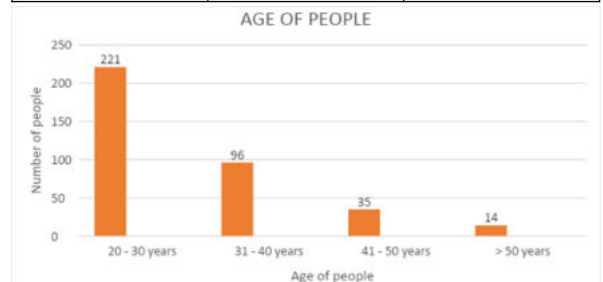
1) Consent to participate

Obtained Consent	Number of people	% of People
Yes	366	96.6
No	13	3.4



2) Age

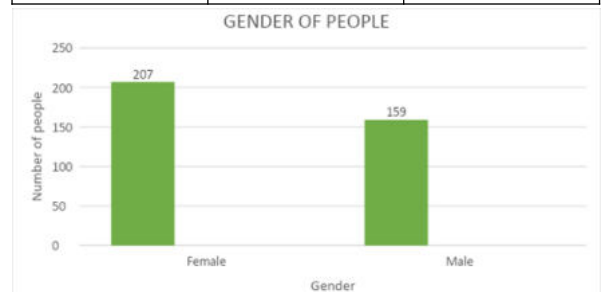
Age in years	No. Of people	% of people
20-30	221	60.4
31-40	96	26.2
41-50	35	9.6
> 50	14	3.8



Among 366 people, 221 (60.4%) were in the age group of 20-30 years, 96 (26.2%) in the age group of 31-40 years, 35 (9.6%) in the age group of 41-50 years, and 14 (3.8%) were > 50 years.

3) Gender

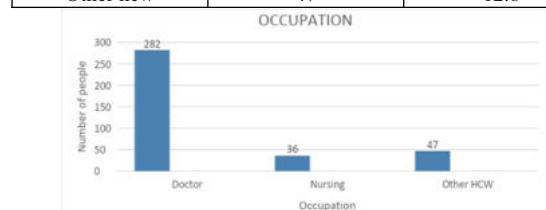
Gender	No. Of people	% of people
Female	207	56.6
Male	159	43.4



The females [207 (56.6%)] are more in the study compared to males [159 (43.4%)].

4) Occupation

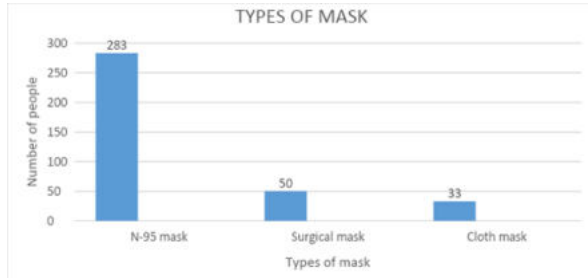
Occupations	No. Of people	% of people
Doctor	282	77.4
Nursing	36	9.8
Other hcw	47	12.8



The structured questions were asked to all the Health care workers, the Doctors responded more, constituting 282 persons (77.4%), nursing staff constituting 36 persons (9.8%), and other health care workers including the pharmacist, encompassed 47 persons (12.8%).

5) Types of masks

Types of masks	No. of people	% of people
N-95	283	77.3
Surgical	50	13.7
Cloth	33	9



All 366 people were wearing the masks. The majority, i.e., 283 people (77.3%) were wearing N-95 mask. 50 people (13.7%) were wearing surgical mask. 33 people (9%) were wearing cloth masks.

6) No. Of hours usage

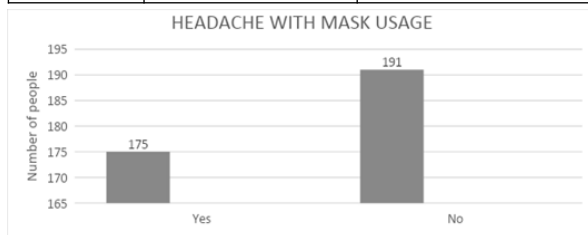
Hours	No. of people	% of people
< 3	47	12.8
3-5	69	18.9
5-8	130	35.5
> 8	120	32.8



Among these 366 people, 47 (12.8%) of them were wearing the mask for < 3 hours duration, 69 (18.9%) were using the mask for 3 to 5 hours, majority of 130 (35.5%) were using for 5 to 8 hours, 120 (32.8%) of them were using for > 8 hours duration.

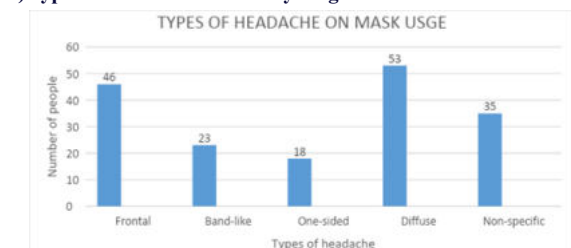
7) Do you experience headache with usage of mask?

	No. Of people	% of people
Yes	175	47.8
No	191	52.2



175 (47.8%) members complained of headache on wearing the mask and 191 (52.2%) were comfortable with mask.

8) Types of headache suffered by usage of mask

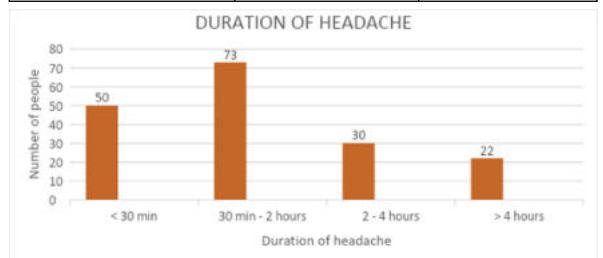


Type	No. Of people	% of people
Frontal	46	26.3
Band-like	23	13.1
One-sided	18	10.3
Diffuse	53	30.3
Non specific	35	20.0

46 (26.3%) had frontal headache, 23 (13.1%) had band-like construction type of headache around the head, 18 (10.3%) had unilateral headache, majority of them, i.e., 58 (30.3%) had diffuse headache, and remaining 35 (20%) of them had non specific types of headache.

9) Duration of headache

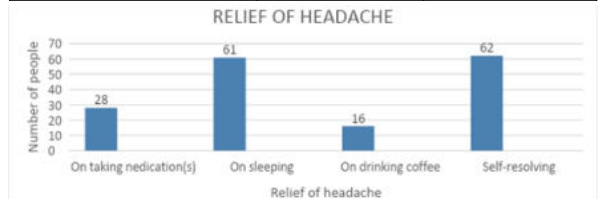
Duration	No. Of people	% of people
< 30 min	50	28.6
30 min - 2 hours	73	41.7
2 hours - 4 hours	30	17.1
> 4 hours	22	12.6



The majority of them, i.e., 73 (41.7%) had headache lasting for 30 minutes to 2 hours, 50 (28.6%) of them had for just < 30 minutes, 30 (17.1%) members had headache for 2 to 4 hours and 22 (12.6%) members, it lasted > 4 hours duration.

10) Headache relieved by the following factors

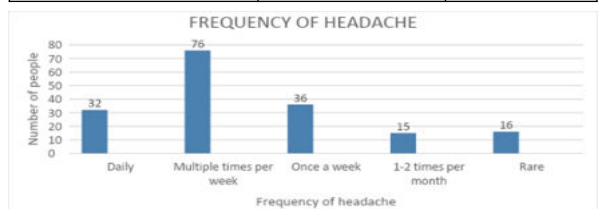
	No. Of people	% of people
On taking medication(s)	28	16.77
On sleeping	61	36.53
On drinking coffee	16	9.58
Self resolving	62	37.12



The headache was relieved without any medications, i.e., self-resolving, in 62 (37.12%), some of them, i.e., 61 (36.53%) got relieved on sleeping for sometime. Headache was alleviated on drinking coffee in 16 (9.58%), and in 28 (16.77%) of them used to take paracetamol tablets for relief.

11) Duration of headache analysed

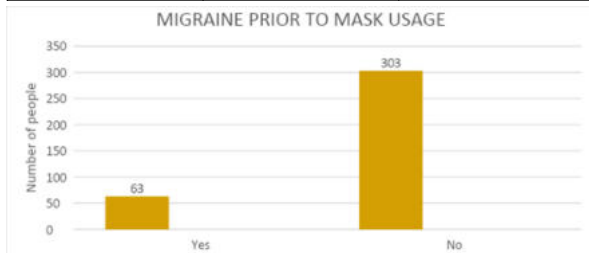
Frequency	No. Of people	% of people
Daily	32	18.3
Multiple times per week	76	43.4
Once a week	36	20.6
1-2 times a month	15	8.6
Rare	16	9.1



Multiple times in a week, the headache persisted for few hours in 76 (43.4%), 36 (20.6%) members had headache once in a week, 32 (18.3%) had daily headache for 3 hours, 16 (9.1%) of them used to get headache very rarely and 15 (18.6%) had occasional headache of 1 - 2 times per month.

12) History of Migraine

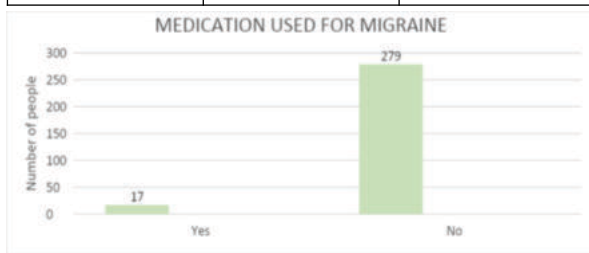
	No. Of people	% of people
Yes	63	17.2
No	303	82.8



303 members (82.8%) did not have migraine before the start of the study. 63 members (17.2%) had history of migraine before the start of the study.

13) If yes, any medications for the same?

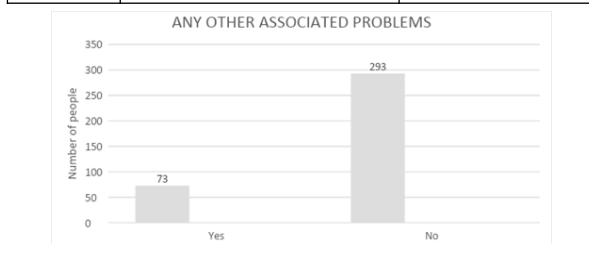
	No. Of people	% of people
Yes	17	5.7
No	279	94.3



279 members (94.3%) were not taking any medications and 17 (5.7%) used to take paracetamol when they experience headache.

14) Any other problems associated with mask usage (sinusitis, DNS, nerve problems)

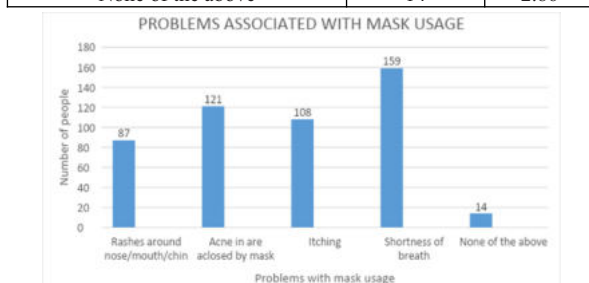
	No. Of people	% of people
Yes	73	19.9
No	293	80.1



293 members (80.1%) did not have history of chronic sinusitis, neurological problems, deviated nasal septum (DNS), ear pain or any longstanding pain. 73 members (19.9%) had history of sinusitis, neurological problems, Deviated nasal septum, ear pain and other chronic problem.

15) The rashes, acne any other associated with headache

Problem/disorder	No. Of people	% of people
Rash around nose/mouth/chin	87	17.80
Acne in area closed by mask	121	24.74
Itching	108	22.08
Shortness of breath	159	32.52
None of the above	14	2.86



87 (17.8%) complains of rashes around the nose/mouth/chin, increase in the acne in the area closed by the mask seen in 121 (24.74%), itching was seen in 108 (22.08%), and the majority complained of shortness of breath, I.e., 159 (32.52%). Those who were wearing glasses complained of fogging of glasses specially those who were wearing N-95 masks.

DISCUSSION:

The soaring number of cases during the pandemic resulted in HCWs wearing the N95 grade masks for prolonged periods in the course of providing patient care despite facing varied problems. Depression was also speculated to be a consequence of work related stress faced by HCWs.

Surgical facemasks treated with nano-functional materials had significantly higher repellence to water, which could prevent droplets contaminated with viruses and bacteria from penetrating the facemasks by capillary actions during breathing cycles. In scientific literature, there are not many studies that correlate the use of face masks to changes in the concentration of oxygen and/or carbon dioxide (CO₂) in respired gases, but it seems a plausible hypothesis due to the barrier element that is interposed in the physiological ventilation mechanism.(1)

The effect on respiratory physiology and muscle performance of wearing training masks designed to simulate a variable altitude situation has been studied. The results are mixed in terms of objective performance parameters, however, it seems likely that mask usage reduces working speed and negatively influences physiological function.(2)

Another phenomenon probably related to the physiopathology of headache after PPE use is the external compression that it generates, as recently reflected by the group of Ong *et al.*² ces levels of alertness and task focus.(3)

Out of 366 patients 175 complained of headache. Majority of them did not complain of headache.

Headaches are more commonly seen in patients who use N95 grade masks with the minimum duration of usage being 2 hours when compared to surgical and cloth masks. New headaches occurred for the first time in close temporal relationship to use PPE, in 45 % of cases.

In our study females are more than males. Some of them had a previous history of headache, particularly migraine. The incidence of headache was more among health care workers with or without migraine. Many of them experienced headaches for the first time after using the mask. Many of them had shortness of breath with or without itching around the nose.

Shortness of breath was more commonly seen in those who worked in wards wearing n95 mask.

Patients with chronic migraine did experience headaches even when they used fine surgical masks made of nonwoven fabric for prolonged periods.

Headaches were found to be more common and frequent in those with a history of migraine in the past and also among those who were known to be allergic to various external allergens.

We require more data on the type of the fabric, brand of the mask and the specific duration of usage of N95 grade masks among HCWs.

CONCLUSION:

Prolonged usage of N95 grade masks seems to have a causal association with appearance as well as recurrence of headache. Short of breath, fogging of spectacles, acne and itching around the nose and mouth are other challenges that need to be factored in while recommending N95 grade masks as a default choice in the present scenario.

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