



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2022; 8(6): 179-187
www.allresearchjournal.com
Received: 02-05-2022
Accepted: 17-06-2022

Aishwarya Amalnerkar
Intern, Modern College of
Physiotherapy, Pune,
Maharashtra, India

Assessment of quality of life of healthy individual using face mask during COVID-19 pandemic a survey study

Aishwarya Amalnerkar

Abstract

Background: In March 2020, India encountered its first official case of COVID-19. Within short period of time thousand of cases were diagnosed around world. It causing WHO to announce it is infectious disease pandemic on 11march 2020 .COVID-19 is spread by respiratory droplets. Face mask are the essential to protect against COVID-19. Due to this pandemic situation need of face mask is increases. Gradually face mask become integral part of day to day social life. Indian population still not become used to wearing face mask. Activity cannot be performed as long as efficiently while wearing masks as compared to when mask are not worn.

Aim and Objective: Assessment of quality of life of healthy individual of 18-45yrs using face mask during COVID-19 pandemic a survey study.

Methods and Materials: Total 1000 participants were selected according to inclusion criteria; informed consent was taken. An interviewer administered questionnaire was sent to each individual. Data was taken and analysed.

Result: A total 1000 participants were given questionnaire in which the mean age group is 18-48yrs. Total 1000 participants were included in final analysis. Data analysis was done using questionnaire. Of these 1000 participants, total 28.7%(n=193) participants having score under 3 points on questionnaire which is mildly affected QOL, total 57.3% (n=620) having score between 4-7 on questionnaire which is moderately affected qol and total 14.7% (n=173) having score between 8-10points which is severely affected QOL. A large proportion were observed with questionnaire score between 4-7(57.3) which is moderately affected QOL.

Conclusion: Of these 1000 participants, total 28.7%(n=193) participants having score under 3 points on questionnaire which is mildly affected QOL, total 57.3% (n=620) having score between 4-7 on questionnaire which is moderately affected QOL and total 14.7% (n=173) having score between 8-10points which is severely affected QOL. A large proportion were observed with questionnaire score between 4-7(57.3) which is moderately affected QOL.

Keywords: Face mask, COVID-19, Quality of Life

Introduction

In March 2020, India encountered its first official case of COVID-19. This novel corona virus referred as SARS-cov-2 originated from Wuhan, china in Dec 2019. Within short period of time thousand of cases were diagnosed around world. It causing WHO to announce it is infectious disease pandemic on 11march 2020. COVID-19 is spread by respiratory droplets. Face mask are the essential to protect against COVID-19^[3].

Mask is covering of all or part of face worn as disguise or to amuse or frighten other. It is covering made of fibre or gauze and fitting over nose and mouth to protect against air pollutants^[3]. Face mask are non-pharmacological public health intervention which play vital role in controlling disease spread^[4]

Wearing face mask will help to prevent the spread of infection and prevent the individual from contracting any airborne infectious gems. When someone coughs, talks, sneeze they could release germs into air that may infect others nearby^[3].

There are various types of masks available like Medical mask, N95 respirators and nonmedical like clothing mask^[4].

Corresponding Author:
Aishwarya Amalnerkar
Intern, Modern College of
Physiotherapy, Pune,
Maharashtra, India

Medical masks are loosely fitted device worn by infected person or health care workers to reduce the transmission risk of infectious respiratory droplets in between individuals by cough or sneeze [4].

Respirators is well fitted device that protects the user against inhalation of contaminated aerosol material [4].

Surgical mask may be able to reduce the infections, it is important to consider the potential role of leakage through the sides of mask along with direct infiltration of intensive viral particles through the mask [4].

Cloth masks are simple, economic and sustainable alternative to surgical mask.

All types of mask reduced aerosol exposure, relatively stable over time, unaffected by duration of wear/type of activity but with high degree of individual variation [4].

Wearing mask for prolonged period of time causes a host of psychologic and physiological burdens and can decrease work efficiency [3]. Activity cannot be performed as long or as efficiently while wearing masks as compared to when mask are not worn. Prolonged use of N95 and surgical mask causes physical adverse effects such as Headache, difficulty breathing, acne, skin breakdown, rashes and impaired cognition. It also interference with communication and thermal equilibrium [2].

Prevention of rational use of PPE and using face mask are imperative to control this pandemic at community level [1]. For general public mask perhaps the most powerful psychological symbol. Mask has evolved with time and yet there is a need to further improve design for safety, tolerability and comfort [2]. Despite the protective function, the effects of mask wearing on respiratory microclimate, respiratory functions and individual sensations are important as well [7]. It was reported that facemask caused less subjective discomfort feeling, lower perception of humidity, heat and breathe resistance than N95 respirator [7]. Wearing masks could affect the wearer's whole body thermal sensation. Long duration wearing of N95 respirator may induce physiological stress on the wearer, making regular tasks more challenging, and causes headaches among healthcare providers [7]. Effects might be due to the respiratory microclimate change surrounding the masks. For example, wearing surgical facemask and N95 respirator was found to induce different temperatures and humidification on outer and inner mask surfaces. These differences are attributed to different material properties of the masks, such as lower air permeability and water vapour permeability in N95 respirator. While the N95 respirator would physically increase the nasal resistance more than 100% compared to the condition without respirator the presence of exhaled moisture or concurrent wearing of surgical facemask has limited effect on breathing resistance [7].

Method

*Study design: Survey Study

*Sample Size: 1000

*Study Population: Urban area

* Study duration: 6 months

Materials

Questionnaire

Consent form

Questionnaire

1. Demographic data:

- a) Name:
- b) Age:
- c) Gender:
- d) Occupation:
- e) Contact no:

2. Which type of mask do you use?

1. Cotton mask
2. Surgical mask
3. N95 respirator

3. For how much time do you use mask daily?

1. 4-6hrs
2. More than 6hrs
3. None of above

4. Any difficulty creates while using mask?

- a) Shortness of breath
- b) Headache
- c) Sneezing
- d) cough problem
- e) Skin rashes
- f) Any allergy
- g) None of above

5. If any difficulty is present then when it increases?

- a) While walking
- a) While stairs climbing
- b) While running
- c) None of above

6. Is there altered sensation of smell due to use of mask?

- a) yes
- b) No

7. Do you feel excessive sweating due to prolonged use of mask?

- a) Yes
- b) No

8. Do you suffer from cognition problem due to mask?

- A) Yes
- B) No

9. Do you have pain behind ear while using mask?

- A) Yes
- B) No

10. Do you have any difficulty during speech?

- A) Yes
- B) No

11. Have you visit any Doctor for this?

Data Analysis

Frequency Table

Table 1: Gender

		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	427	45.0	45.1	45.1
	Female	520	54.9	54.9	100.0
	Total	947	99.9	100.0	
Missing	System	1	.1		
Total		948	100.0		

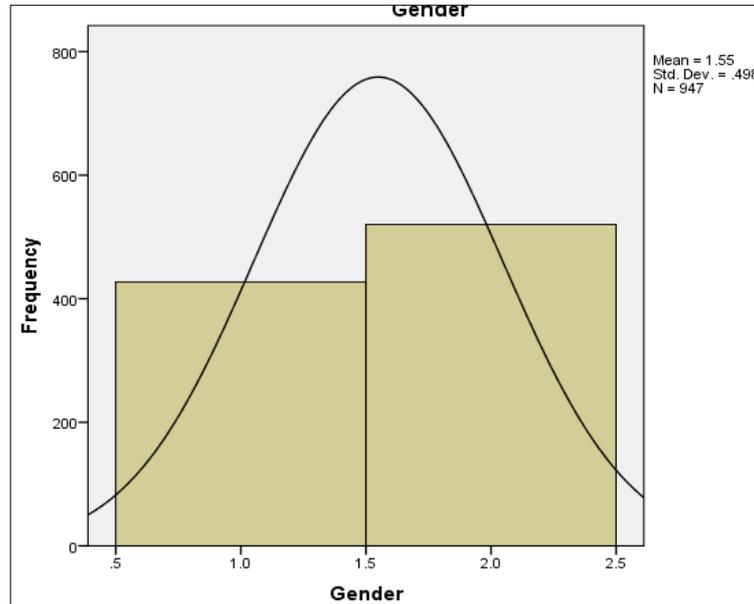


Table 2: Which type of mask do yo use?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cotton mask	375	39.6	56.0	56.0
	Surgical mask	103	10.9	15.4	71.3
	N95 mask	192	20.3	28.7	100.0
	Total	670	70.7	100.0	
Missing	System	278	29.3		
Total		948	100.0		

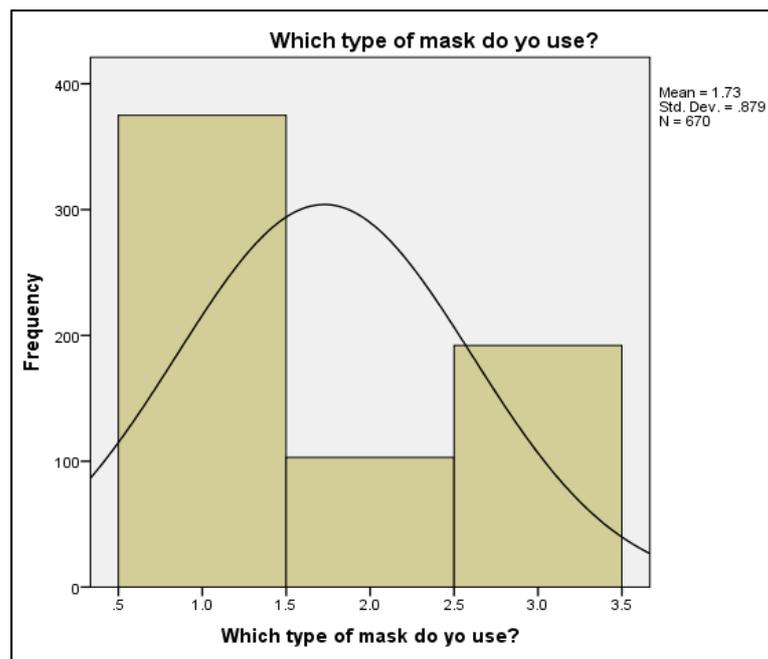


Table 3: How much time do you use face mask daily?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4 hrs	197	20.8	21.7	21.7
	4-6 hrs	331	34.9	36.4	58.1
	More than 6 hrs	350	36.9	38.5	96.6
	None of above	31	3.3	3.4	100.0
	Total	909	95.9	100.0	
Missing	System	39	4.1		
Total		948	100.0		

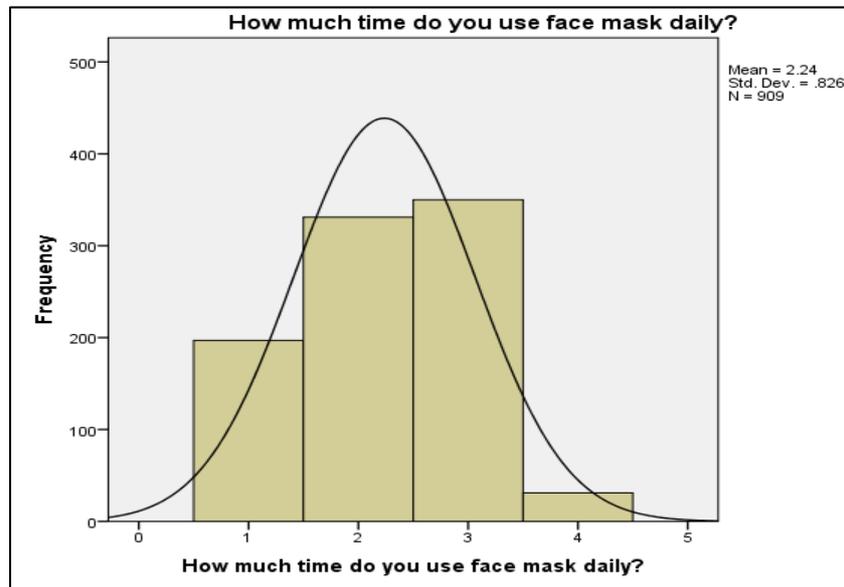


Table 4: Any difficulty creates while using mask?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Shortness of breath	232	24.5	43.5	43.5
	Sneezing	26	2.7	4.9	48.4
	Coughing	18	1.9	3.4	51.8
	Skin rashes	37	3.9	6.9	58.7
	Any allergy	8	.8	1.5	60.2
	Headache	37	3.9	6.9	67.2
	None of above	174	18.4	32.6	99.8
	Other	1	.1	.2	100.0
Total		533	56.2	100.0	
Missing	System	415	43.8		
Total		948	100.0		

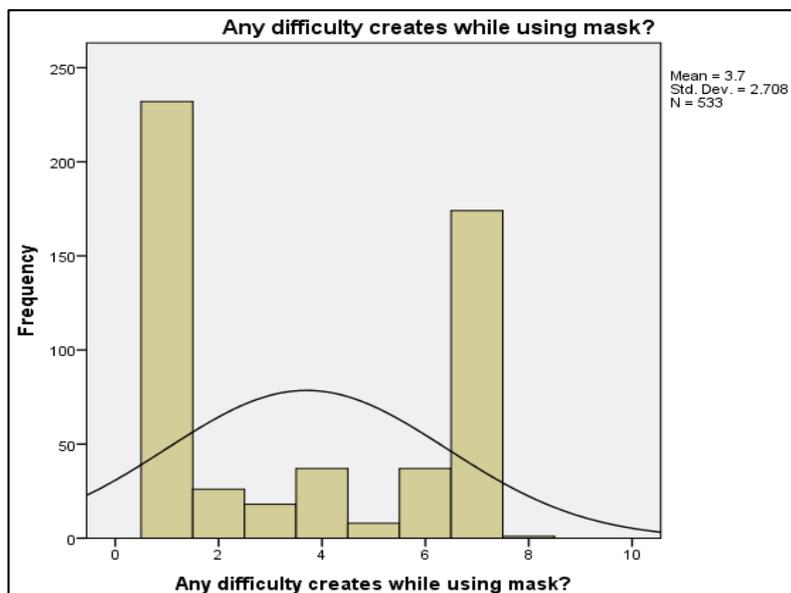


Table 5: If any difficulty is present, then when it increases

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	While walking	134	14.1	22.0	22.0
	While stair climbing	247	26.1	40.6	62.7
	While running	67	7.1	11.0	73.7
	None of above	160	16.9	26.3	100.0
	Total	608	64.1	100.0	
Missing	System	340	35.9		
Total		948	100.0		

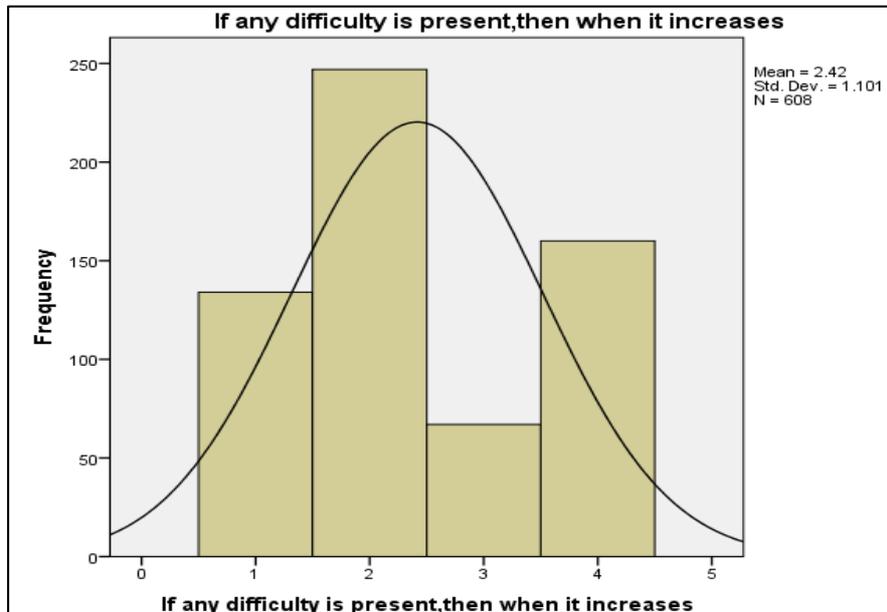


Table 6: Is there altered sensation of smell due to use of mask?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	258	27.2	27.5	27.5
	No	466	49.2	49.7	77.3
	May be	213	22.5	22.7	100.0
	Total	937	98.8	100.0	
Missing	System	11	1.2		
Total		948	100.0		

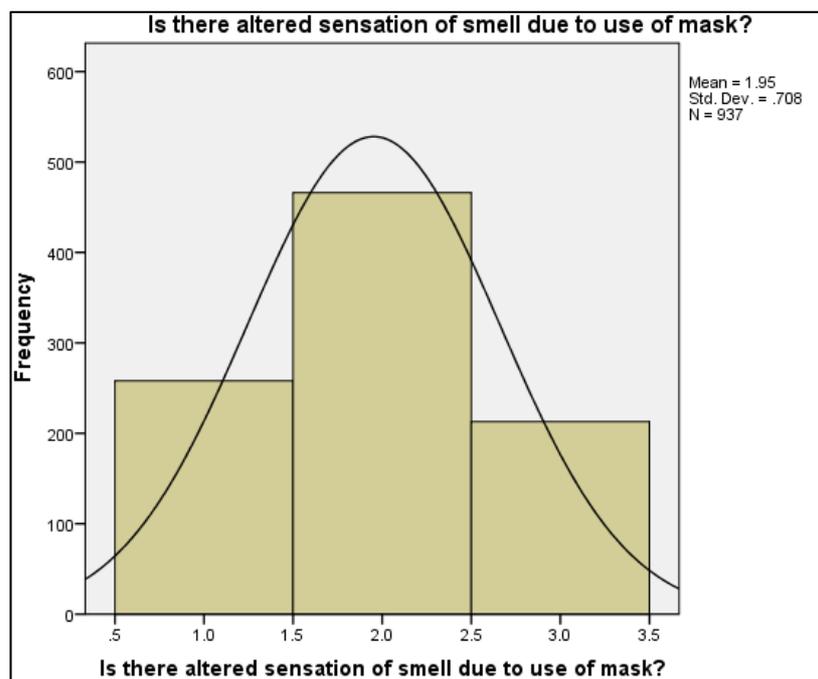


Table 7: Do you feel excessive sweating due to long use of mask?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	769	81.1	81.1	81.1
	No	179	18.9	18.9	100.0
	Total	948	100.0	100.0	

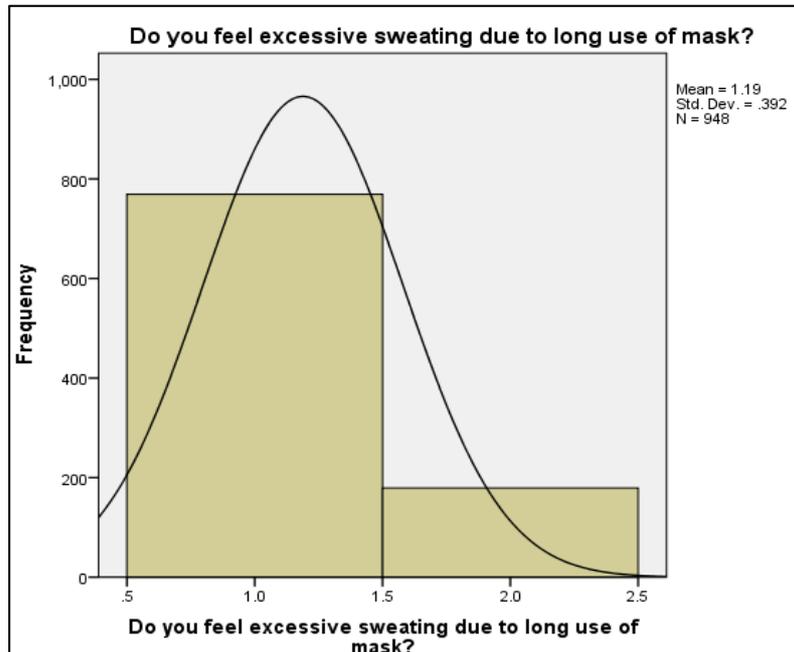


Table 8: Do you suffer from cognition problem due to mask?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	377	39.8	39.8	39.8
	No	571	60.2	60.2	100.0
	Total	948	100.0	100.0	

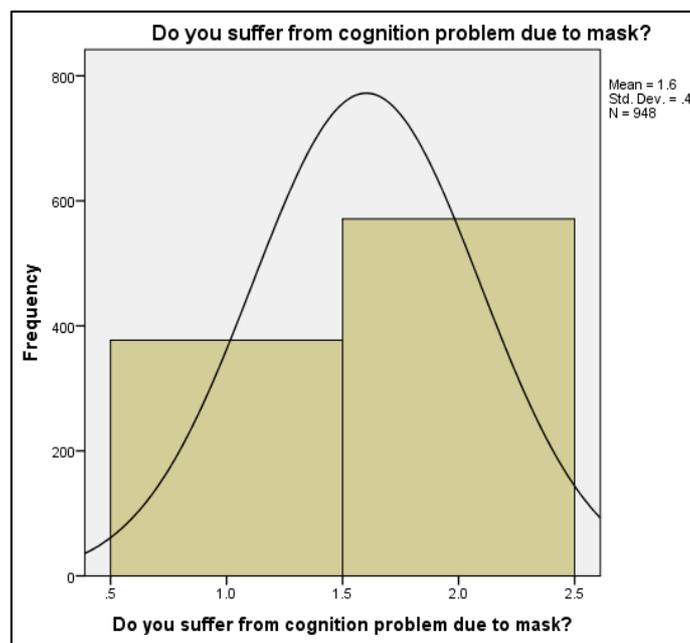


Table 9: Do you have pain behind ear due to straps of mask?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	786	82.9	82.9	82.9
	No	162	17.1	17.1	100.0
	Total	948	100.0	100.0	

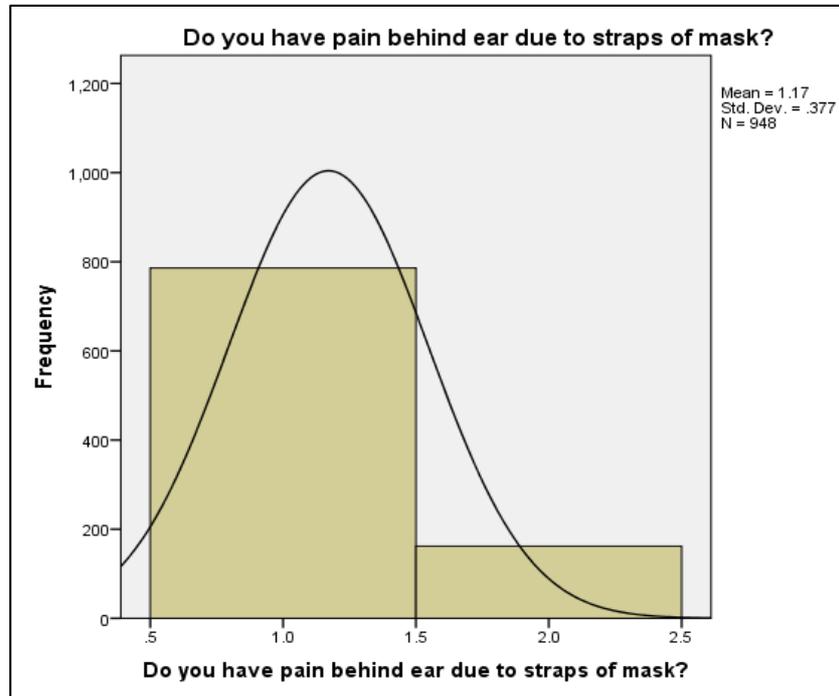
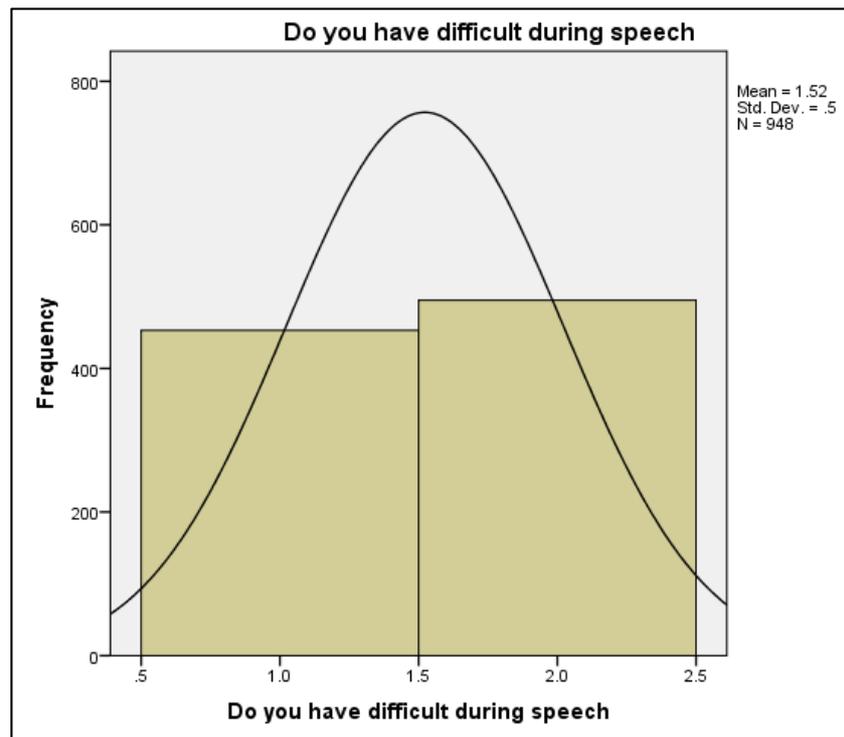


Table 10: Do you have difficult during Speech

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	453	47.8	47.8	47.8
	No	495	52.2	52.2	100.0
	Total	948	100.0	100.0	



Results

A total 1000 participants were given questionnaire in which the mean age group is 18-48yrs. Total 1000 participants were included in final analysis.

Of this 1000 participants, 544 i.e 44.70% using N95 mask, 305 i.e 25.06% using surgical mask and 544 i.e 44.70% participant using cotton mask.

Of this 1000 participants, 376 i.e 43.3% using face mask for more than 6 hrs. , 218 i.e 22.02% using mask for 4 hrs.

and 363 i.e 36.67% using face mask for 4-6 hrs.

Of these 1000 participants, 585 i.e 37.17% experienced shortness of breath, 188 i.e 11.94% experienced sneezing, 189 i.e 12.01% experienced coughing, 244 i.e 15.50% experienced headache while prolong use of mask.

Total 85% of participants develop shortness of breath, coughing, headache on exertion (Walking, stair climbing, running) which is probably due to tight mask causing hypercapnic hypoxic environment leading to numerus

physiological alteration such as cardio respi stress & metabolic shift.

Of these 1000 participants, about 80.9% experienced excessive sweating, about 9.66% having skin rashes & 2.46% facing allergies around mouth and face. This were mainly cause due to hot and humid air in death space beneath the mask in comparison to ambient temperature.

About 82.63% develop pain behind ear which is possibly due to tight straps of mask.

A small proportion of population were observed with symptoms of altered smell i.e 27.48%, cognition problem 39.7% and 47.48% having difficulty during speech.

Of these 1000 participants, total 28.7% (n=193) participants having score under 3 points on questionnaire which is mildly affected QOL, total 57.3% (n=620) having score between 4-7 on questionnaire which is moderately affected QOL and total 14.7% (n=173) having score between 8-10 points which is severely affected QOL. A large proportion were observed with questionnaire score between 4-7 (57.3) which is moderately affected QOL

Discussion

In this study, among the 1000 participants the outcome suggests that continuous usage of facemasks can lead to a wide spectrum of nasal discomfort and complaints pertaining to the facial skin and oral cavity due to its prolonged usage. There is a decrease in humidification of air beneath the facemask and decrease in transpiration of the skin around the nasal and perioral region.

Facemasks protect against harmful microorganisms and its utilisation is essential during the pandemic. Facemasks prevent transpiration, increase perspiration and temperature in perioral region which could possibly be due to decreased transpiration.

Wearing the facemask for a prolonged period causes reduced heat loss from the body by various mechanisms such as conduction, convection, evaporation and radiation. The difference in temperature around the outer surface of the mask and the environment there is a relative increase in warmth and dampness of the expired air causing the condensation of moisture on the respirator. This phenomenon impairs respiratory heat loss thereby increasing the heat burden. Facemasks prevent normal transpiration and the dead space underneath the facemasks is filled with hot, humid expired air respiratory cycle. Since facemasks cover both nose and mouth it results in decrease in cooling impact of the facial temperature. DuBois *et al.* stated that skin temperature > 34.5 degree Celsius is not acceptable due to the increased thermal sensation and results in significant discomfort to the wearers. In the current study, we found about 80.91% of participants have developed excessive sweating around the mouth. As a result of the discomfort caused by the facemasks the subjects tend to touch the facemasks at frequent intervals and it can lead to contamination of the hands leading to more disseminated infections.

Simulated nasal breathing while performing moderate exercise in a comfortable surrounding showed that conditioning capacity of air decreased to 11% due to brief existence of inspired air in the nose. When the effort increases, the air conditioning capacity significantly decreases. Another study stated that temperature and the quantity of water delivered by expired air is notably higher with mouth breathing in compare with nasal breathing.

Therefore the net respiratory heat loss is higher with oronasal breathing than nasal breathing during exercise

In our study also we assessed that about 37.17% of the participants had shortness of breathing on exertion with the facemasks on.

There has been an increased incidence of skin conditions in participants due to the extended use of facemasks. Contact dermatitis, contact urticaria occurs due to adhesives, rubber in straps, free formaldehyde released from the non-woven polypropylene. Foo *et al.*, analysed healthcare workers during the SARS pandemic in 2003 at Singapore, and reported that 51.4% experienced itch induced by face masks^[14]. In an experimental study by Roberge *et al.*, of a group of 20 healthy people wearing surgical masks during continuous walking on a treadmill at a low-moderate work rate (5.6 km/h) for 1 h, facial itch occurred in 7% of participants, and an additional 11% experienced skin irritation^[7].

Zuo *et al.*,^[15] showed that pre-existing acne, rosacea and seborrheic dermatitis were exacerbated by using face masks. This is in accordance with the opinion expressed by a group of Chinese experts^[16]. In the current study, about 9.66% of the participants developed skin rash and about 39.0% & 2.46% participants having allergy. Around 82.63% of the participants developed pain behind ear due to elastic straps of the face masks. A recommendation is improved mask design with a focus on safety, comfort and tolerability. The study with 1000 participants is adequate enough for the technical hypothesis but insufficient for evaluation of multifactorial effects. If we had involved people with cardiac, pulmonary co-morbidities in the study, it would result in a significant change in the results of the study.

Conclusion

In conclusion, the use of facemask plays a pivotal role in causing significant discomfort in all the participants during its prolonged usage which can limit the efficient usage of facemask, leading to decreased protection and affected QoL. Since facemasks are essential to protect us from COVID-19, certain strategies can be followed to reduce the heat burden due to its prolonged usage such as encouraging nasal breathing, pre-use refrigeration of the respirator.

References

1. Purushothaman PK, Priyanga E, Roopak Vaidhyaswaran. Effects of prolonged use of face mask on healthcare in tertiary care hospital during COVID-19 pandemic. 2020 September 15.
2. Yihui Goh, *et al.* Brain behav, Vijay K Sharma. The face mask: How real protection becomes psychological symbol during COVID-19. 2020 August.
3. Elisheva Rosner, MSN, RN-c, Morgan Stanley. Adverse effects of prolonged mask use among health care professional during COVID-19. NJ 07012. 2020 June.
4. Harnoor Kaur sra, Amit Sandhu and Meenu singh. Use of face mask in COVID-19. Indian J. pediatr: 2020 May.
5. Raina MacInture C, Arbar Ahmad chughtai. A rapid systemic review of efficacy of face mask and respirators against corona virus and other respiratory transmissible viruses for community, health care worker and sick patients. 2020 April 30.
6. Antonio, Lazzarni Face masks for the public during the COVID-19 crisis. BMJ 2020 April 20.

7. Jian Hua Zhu, Shu Jin Lee, De Yun Wang. Effects of long duration wearing N-95 respirators and surgical face mask: pilot study. 2014 Nov 22, 1.
8. Li Y, Tokura H, Guo YP, Wong ASW, Wong T, Newton E. Effects of wearing N95 and surgical face mask on HR, Thermal stress and sensation. 26 may 2005.