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ORIGINAL ARTICLE

TO ANALYSE THE IMPACT OF WEARING DIFFERENT TYPES OF MASKS AND EVALUATING PHYSIOLOGICAL VITAL INDICATORS

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ABSTRACT

Background of the Study: Wearing face mask is recommended as part of personal protective and public health measure to prevent the spread of disease. The analysis framed the four dimensions of the wearing face mask it appears essential for designing more effective health communication about the spread of disease or other global crises in the future. The personal protection using worldwide during this pandemic the impact of covid-19 was felt throughout the world and it's recommended to use. Aim & Objective of the study is to analyze the impact of wearing different types of masks and evaluating the physiological vital indicators. **Methodology:** This observational study was conducted in physiotherapy department of ACS Medical college and hospital. In which 40 subjects were randomly selected were based on the inclusion and exclusion criteria. Subjected selected both boys and girls, age group between 18- 30 years adults wearing mask for prolonged period and check the respiratory rate are included for the study. Included samples were with Age group between 18-30years College students, both boys and girls, person who wearing mask for prolonged period. **Result:** Total 40 participants were included in the study base on specific selection criteria. Comparative ANOVA between Group A, B, C and D showed significant difference in Respiratory Rate, and no significant difference in Pulse Rate and Blood Pressure between the Groups A, B, C and D. Mean value of Respiratory Rate, Pulse Rate, Blood Pressure shows Group D is Better. **Conclusion:** It is concluded there was a significant difference in group D by using ANOVA. This study confirms the impact of wearing different types of masks gives the effective respiratory rate.

Key words: Mask; Prolonged period; Respiratory rate; Pulse Rate; Blood pressure; covid-19; Pandemic.

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INTRODUCTION

A MASK is an object normally worn on the face typically. During this pandemic have been employed as public and personal health control measure against the spread of airborne disease. The intent as source control to limit the transmission of the virus and personal protection to prevent infection¹. There are about 95% of world's population live in countries that recommend or mandate the use of mask in public during this pandemic between the different types of face mask that have been recommended throughout the COVID-19 pandemic, which is higher or lower Effect. Prolonged use of any mask including n95 Respirator, has not been shown cause to adequate oxygen in healthy people. The prolonged use of face mask can cause adequate oxygen supply of tissue level can happen due to breathing exhaled and inhaled over and over again which turns carbon dioxide makes us feel dizzy.

There are different types of masks seen people are wearing in this pandemic. The effectiveness of cloth masks the filtrations in cloth mask is lower than the other, the other will protect from protect from infection they will not cause breathing is taken fast in double mask they also cause slight discomfort. The proper wearing of mask is mask us to safe from all infectious disease some masks are reusable, the n95 mask are comfortable to wear because of lesser air resistance².

Wearing masks for a prolonged amount of time causes a host of physiologic and psychologic burdens and can decrease work efficiency. Activity cannot be

performed as long or as efficiently while wearing masks as compared to when masks are not worn³). Additionally, the timeframe that an activity can be sustained is decreased when wearing masks and prolonged use of N95 and surgical masks causes physical adverse effects such as headaches, difficulty breathing, acne, skin breakdown, rashes, and impaired cognition. It also interferes with vision, communication, and thermal equilibrium.

In general, the term face mask governs a wide range of protective equipment with the primary infection of reducing the transmission of particles or droplets. But surgical mask were originally introduced to protect surrounding person from the wearer such as protecting patients from open wound against infection agent from surgical team^(3,5). Since the patient role has been multiple regulatory agencies. Protection from infected person wearing a mask in reduce the spread of respiratory droplets containing virus.

There is increasing evidence the face mask should be worn in public spaces as an integral part of hygiene measures to contain the virus⁽¹⁾. With increase in use among the general population more reports have suggested the mask wearing present in health risk. During the covid virus -19 most countries and health organizations WHO propagated wearing face mask early 2020 to reduce the spread of severe acute respiratory syndrome.

Face mask not only have direct causative medical impact in terms of preventing virus from spreading to those who are most vulnerable. They also positive social effect as

wearing mask allows for relaxing to others measures such as strict isolation and quarantained. Aerosol and droplet during various respiratory activities transmission of virus emitted droplet and aerosols to susceptible individuals may occur physical contact of deposition on surface of mucosal.

Direct inhalation of virus-laden aerosols. Different transmission modes contact droplet, spray, aerosol, disease including for covid alternating mask can potentially reduce outward transmission by infected individuals, providing protection to others(4). There have indicator asymptomatic carries of covid 19 infecting others leading to increasing albeit inconsistent covering of different types in reducing outward transmission of aerosols and droplets from expiratory activity(2,8).

METHODOLOGY

It is an observational study which include 40 subjects selected based on inclusion and exclusion criteria. The subjects are divided into 4 groups. Group A, B, C, D who are wearing mask for prolonged period of time.

Group A includes subjects who wear cloth mask regularly. Group B includes subject who wear surgical mask regularly. Group C includes subject who wear N-95 mask regularly. Group D includes subject who wear double mask regularly.

The divided groups are assessed for respiratory rate, pulse rate, blood pressure individually using pulse oximeter, sphygmomanometer based on the data collected analysis is been done to evaluate the impact of wearing mask of various types of vital indicators.

Outcome Measures: Pulse oximeter,

Sphygmomanometer, Cloth mask.



Fig 1: Pulse oximeter



Fig 2: BP Apparatus



Fig 3: Cloth mask

**Fig 4:** Surgical mask**Fig 5:** N95 mask**Fig 6:** Double mask

Data Analysis

Comparative effects of Respiratory Rate, Pulse Rate, Blood Pressure between Group A, B, C and D

Variables	SS	DF	MS	F Value	P value	Sig. different (P < 0.05)
RR	64.90	3	21.63	14.37	<0.0001	****
PR	33.08	3	11.03	1.583	P=0.2103	No
BP-SYS	154.7	3	51.56	1.546	P=0.2193	No
BP-DIA	66.00	3	22.00	1.552	P=0.2179	No

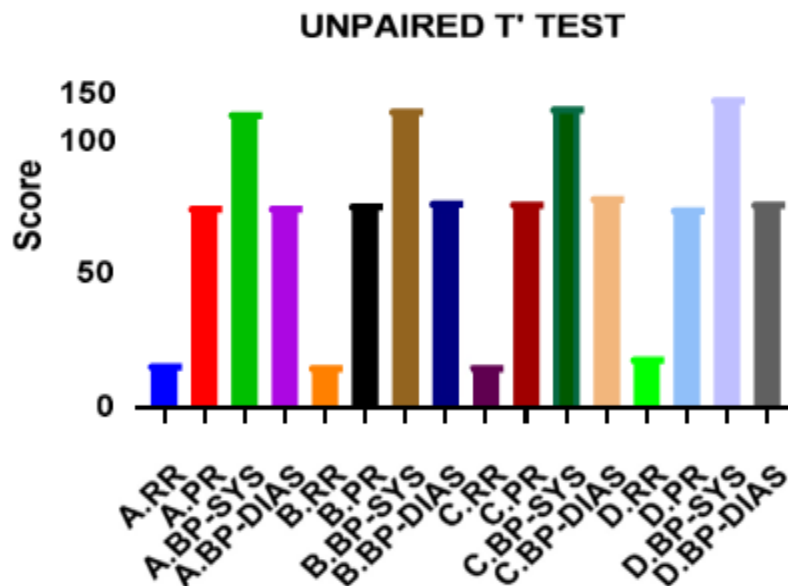
Table 1: comparative ANOVA Test for representation of Respiratory Rate, Pulse Rate, Blood Pressure between the Group A and B

The above table 5 shows significant difference in Respiratory Rate, and no significant difference in Pulse Rate and Blood Pressure

between the Groups A, B, C and D

	RR Mean	PR Mean	SYS Mean	DIA Mean
Group A 100	16.10	74.90	110.1	75.10
Group B 50	15.40	75.80	111.3	76.90
Group C 50	15.40	76.70	112.1	78.70
Group D 0	18.50	74.30	115.4	76.50

Table 2: Mean of Respiratory Rate, Pulse Rate, Blood Pressure between the Group A, B, C, and D



Comparative test between Group A , B, C and D on Respiratory rate, Pulse Rate and Blood Pressure

Graph 1: Graphical representation of Respiratory Rate, Pulse Rate, Blood Pressure between the Group

RESULT

Table 1-It reveals the sum of square degree of freedom and mean square along with the F value and P value of group A, B, C and D. Comparative effect on RR [respiratory rate], PR [pulse rate], and BP [blood pressure].it shows that RR [respiratory rate]

shows highly significant difference of P value <0.001 Then PR [pulse rate] and BP [blood pressure].

Table 2 -Reveals the mean value of RR [Respiratory rate], PR [pulse rate], BP [blood pressure] between group A, B, C, and D.

On comparing the mean value of group, A, B, C, and D. On RR [respiratory rate], PR [pulse rate], BP [blood pressure] shows that group d shows highly significant difference with P value < 0.001 then group A, B, C. Which also shows significant difference but less than that of group-D.

DISCUSSION

The outbreak of COVID-19 has brought about some drastic changes to our way of life.

The centers for disease control and prevention (CDC) (2020) issued a recommendation that citizens wear cloth mask to protect themselves and others. Wearing mask has been proven to be an effective method of protection in this pandemic which reduces both exhalation of virus laden aerosols from COVID patient⁹.

A mask with a higher filtration resistance has worse breathability. The CO₂ will slowly build up in the mask over time. However, the level of CO₂ likely to build up in the mask is mostly tolerable to people expose to it. It is unlikely that wearing a mask will cause hypercapnia (10).

It is well known that unlike N95, a disposable

three-layer surgical mask will not fit tightly with the face fitting can become worse with physical activities or incorrect wearing practices.

Wearing mask significantly slows down inspiratory flows and extends respiration zones which favors the inhaleability of ambient aerosols into nose.

Thus, the study is proved that all types of masks as it impacts reducing respiratory rate and blood pressure but double shows highly significance with reduction in respiratory rate.

Further studies can be done evaluating peak flow rate using computerized spirometer.

CONCLUSION

In conclusion, it was found that there is significant difference of wearing different types of masks in respiratory rate and no significant difference in pulse rate and blood pressure.

In this study, It was concluded that group D (Double Mask) shows highly significant difference with P value than group A, B, & C.

While breathing may require a little extra effort when double masking. it should not make breathing difficult. The rise of transmissible variants means that taking good preventative measures than others.

This study concluded the impact of wearing double mask gives the effective respiratory rate.

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