



A KNOWLEDGE, ATTITUDE AND PRACTICES STUDY ON MASK HYGIENE AMONG HEALTH CARE WORKERS OF PT. JLN GMC CHAMBA, HP

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ABSTRACT

Introduction- COVID-19 is a respiratory disease caused by SARS COV-2 virus. This disease is primarily transmitted between people mainly via respiratory droplets⁵ or contact transmission⁴ but airborne transmission⁶ is also not ruled out especially in close congested environment. As airborne transmission is also underlying there especially in health care settings, many international agencies have recommended N95 respirators for health Care Workers. As per data given by IMA 744 MBBS doctors have been died due to Covid – 19 till 4 February 2021³. In market due to high demand, many different type of masks are available with different specifications. Many of them are not effective to safeguard health care workers against COVID 19 infection². Hence this study is planned to assess knowledge, attitude and practices of health care workers of tertiary care hospital towards mask hygiene. **Objective -** To assess knowledge, attitude and practices of health care workers of tertiary care hospital towards mask hygiene. **Methods -** A cross-sectional study was conducted after IEC approval. A semi-structured, pretested, open as well as close ended questionnaire was given to all health care workers of Pandit Jawaharlal Nehru Government Medical College & Hospital Chamba available at the time of interview to assess their knowledge, attitude and practices towards mask hygiene. Total 204 subjects were interviewed. **Results -** only 5 % were wearing NIOSH certified N95 mask. 80% Doctors did not know difference between N95 mask and equivalent to N95 mask. Only 38 % doctors correctly identified the N95 masks. only 32.7% doctors knew identification features of counterfeit N95 masks. 90.2% doctors did not know correct removal criterion of N95 respirator. **Conclusion -** Training and sensitization on mask hygiene is utmost needed.

KEYWORDS : Health Care Workers, N95 Respirator, N95 Equivalent Respirator, Covid 19, Disinfection

INTRODUCTION

Covid -19 is caused by virus SARS COV-2 or novel coronavirus-19. This disease is primarily a respiratory disease and transmitted mainly through respiratory droplets or contact transmission. International agencies have also considered likely airborne transmission for COVID 19. During treatment of COVID 19 patients many doctors and nurses have been infected and unfortunately some of them have been died. As on 15 March, Globally more than 120 million peoples have been infected and more than 2.5 million people have been died¹. More than 2 million cases are also found in India and out of them 41 thousands have been died including many doctors and other health care staff. As per data given by IMA 744 MBBS doctors have been died due to Covid – 19 till 4 February 2021³. At present no definitive pharmaceutical treatment is available. Even variants of SARS COV 2 virus can evade vaccine induced immunity. Hence only prevention is ultimate resort. Some effective preventive measures are there like Social distancing, hand washing and mask hygiene. As airborne transmission is also incriminated in the transmission of this deadly disease especially in health care settings, N95 respirators play a crucial role to safeguard HCWs. But in market due to high demand, many different types of mask are available with different specifications. Many of them making false claim of N95 certification. Most of them are not effective to safeguard health care workers against COVID 19 infection². Prime Minister of India has already been announced that mask will be the part of the life for long time. Hence health Care workers should be well versed regarding minor details of mask so that not only they can appropriately select the right mask but also adopt correct mask wearing practices. Hence this study is planned to assess knowledge, attitude and practices of health care workers of tertiary care hospital towards mask hygiene

Materials and Methods – This was the cross-sectional study. Study was conducted after obtaining IEC approval. A semi-structured, pretested questionnaire was given to all health care workers of Pandit Jawaharlal Nehru Government Medical College & Hospital Chamba available at the time of interview

to assess their knowledge, attitude and practices towards mask hygiene. Total 204 HCWs were recruited. Written informed consent was obtained from all the study participants prior to interview. Data was entered & analysed for percentage in MS Excel.

Study Design – This was the Cross-sectional study on Health Care workers of Pt Jawaharlal Nehru Govt. Medical College Chamba.

Objectives –

To assess knowledge, attitude and practices of HCWs of tertiary care hospital towards mask hygiene

RESULTS –

This cross-sectional study was conducted in tertiary care hospital of district Chamba, Himachal Pradesh. This study found that only 15% HCWs were using N95 masks or “equivalent masks” in working area. Out of 15% HCWs, only 5 % HCWs were wearing NIOSH certified N95 mask. Rest of 25% HCWs were wearing “counterfeit N95 masks”. 80% HCWs did not know difference between NIOSH certified N95 mask and “equivalent” to N95 mask. NIOSH has already designated some identification features of N95 masks¹⁴. On the basis of Identification features only 38 % HCWs correctly identified it. 90.2% HCWs did not aware regarding correct removal criterion of N95 respirator. 79.5 % HCWs never practiced user seal check. N95 or “N95 equivalent” masks have country specific standards but this study found that 70% of HCWs did not know the name of country specific standards. Only 20.5% HCWs practiced user seal check whenever they put on respirator. 41 % doctors did not know correct home based disinfection method for N95 respirator¹³. There are certain quality control parameters of N95 masks. One key parameter is known as Particle Filtration Efficiency Test. Only 9% HCWs knew that Particle filtration efficiency of N95 mask is checked by Sodium chloride aerosols, size ranges between 75 ± 20 Nanometre⁹. Only 17.8 % HCWs knew that size of SARS COV-2 is between 0.06 micron to 0.14 micron⁸. 54% HCWs responded that N95 masks are washable. 29.1 %

HCWs responded that head band masks are better than or same to ear loop masks. Only 19.9 % doctors knew that working in ICU is carrying high risk for COVID 19 transmission as per GOI Infection Prevention Control guidelines. Only 40.5 % HCWs were aware that Indian standard "IS 9473" is equivalent to N95 masks¹⁰. Only 29.8 % HCWs correctly responded that European standards "EN 149:2001+A1:2009" is equivalent to N95 masks¹¹. Only 23.4 % HCWs correctly answered that Chinese standard "GB19083" is equivalent to N95 masks¹². Only 9.8 % HCWs were aware about correct "removal criterion" of N95 masks. Only 34.7 % HCWs correctly answered that FFP1, FFP2, FFP3 filter designation corresponds to filtration efficiency 80%, 94% and 99.7% respectively. 50% doctors did not know that out of N80, N95 & N99 mask, N80 mask will offer least protection.

Table I- Different Features of N95 Masks

S.No.	Question on Knowledge Domain	Correct Response (%)
1	Identification features of original N-95 mask	38.0
2	Identification features of counterfeit N-95 respirator	32.7
3	Correct home based decontamination methods of N-95 respirators in pandemic conditions	41.0
4	Correct Removal Criterion of Respirators	09.8
5	Particle Filtration Efficiency for N95 masks	09.0

Table II- Different Countries Standards Equivalent to N95 Mask

S. No	Question on Knowledge Domain Different Countries Standards (Equivalent to N95 Mask)	Correct Responses (%)
1	Indian Standard 9473 is equivalent to N-95 mask	40.5
2	US Standards of N-95 mask	70.1
3	European Standard EN 149:2001+A1:2009 is equivalent to N-95 mask ¹¹	29.8
4	Chinese Standard GB 19083-2010 is equivalent to N9-5 mask ¹²	23.4

Table III – Knowledge of HCWs Towards Mask Hygiene

No.	Questions on Knowledge Domain	Correct Response (%)
1	N95 masks are not washable	46.0
2	ICU is "High risk area" regarding COVID 19 transmission	19.9
3	Head band mask are better than Ear band masks	29.1
4	FFP1, FFP2, FFP3 level corresponds to 80%, 94% and 99% filtration level respectively	34.7
5	Methods of user seal check of respirator	20.5

Table IV – Practices of Health Practitioner Towards Mask Hygiene

S.No.	Questions on Practice Domain	Correct Response (%)
1	HCWs using respirator in working area	40.0
2	HCWs correctly identify N95 Mask	05.1
3	HCWs wearing US Standard NIOSH N95 Mask	05.0
4	HCWs wearing N95 Equivalent Mask	10.0
5	HCWs wearing Counterfeit N95 Masks	25.0

6	HCWs practicing decontamination procedure for Respirator	15.6
7	Correct method of Doffing & Donning of Mask practised by HCWs	36.8
8	HCWs practicing User Seal Check of Respirator	20.5

DISCUSSION -

As per data given by Indian Medical Association 744 doctors³ were died due to COVID-19 till 4th February 2021 hence adequate protection against SARS COV 2 is extremely necessary. Unfortunately WHO has largely ignore the importance of the airborne transmission route (15). Studies have also shown that airborne transmission has dominant role in transmission of COVID 19 (6,7). Many studies have been confirmed that airborne precautions are necessary to prevent the spread of COVID 19 (7). Studies have also demonstrated the efficacy of N95 respirator against airborne transmission of respiratory viruses (16). COVID 19 patient is most infectious during pre-symptomatic stage (17) i.e. before onset of symptoms. Hence HCWs should take all necessary precautions during clinical work irrespective of patient's symptoms. Basically "N95" are standards given by National Institute of Occupational and Safety Health (NIOSH), USA. NIOSH has set certain standards for N95 masks. Only those particulate masks which are certified by NIOSH and meet the required standards are designated as N95. Other countries like India, China, Europe etc. have also set the standards of particulate masks and these masks are called N95 equivalent masks. As per WHO and also according to Government of India US standard N95 mask is best mask against SARS COV-2 but due to high demand, supply is short. Due to scarcity of masks CDC Atlanta permits the reuse of N95 masks in emergency conditions. Due to these unprecedented circumstances health care workers should be well versed in home based decontamination measures as well as identification of correct N95 or equivalent mask. But in this study it was found that only 41 % doctors knew the correct home based decontamination measure and very few doctors knew different country standards of N95 equivalent masks, only 40.5 % doctors knew IS 9473 is Indian Standard equivalent to N95 masks¹⁰. Only 29.8 % doctors knew that European standard, EN 149:2001+A1:2009 is equivalent to N-95 mask¹¹. Only 27.4 % doctors knew Chinese Standard KN95 GB 2626-2006 is equivalent to N-95¹². Only 38 % doctors correctly knew that Identification features of original N-95 mask. This little knowledge may be harmful for health professionals, as in market many fake products are selling but all claiming for original N95 mask. Only 46 % doctors knew that N95 masks are not washable and washing may weaken the protection given by mask. Because washing destroy the charges of filter media. 79.5 % doctors never checked the user seal and this can lead to increased inward leakage and resultant more chances of contracting the infection. 67.3 % doctors did not know features of counterfeit mask and this poor knowledge may lead to wrong selection of substandard mask by HCWs. 63% doctors were not correctly practicing procedure of doffing & donning of mask and this can increase the chances of receiving the infection. 65.3 % doctors did not know that FFP1, FFP2, FFP3 level corresponds to 80%, 94% and 99% filtration level respectively and due to lack of knowledge they may select wrong mask.

CONCLUSIONS –

Training and sensitization on mask hygiene is utmost needed so that HCWs can understand difference between N95 masks, Equivalent to N95 masks and counterfeit masks so that they can select right mask for their self to safeguard against Covid 19. HCWs should also know home based disinfection method as supply of N95 masks is very scarce and due to shortage HCWs are bound to reuse the N95 masks so they

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