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Perceptions and behavioral traits of mask usage during Covid-19 pandemic: a cross sectional study from Kerala

Percepciones y rasgos conductuales del uso de mascarillas durante la pandemia de Covid-19: estudio transversal de Kerala

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ABSTRACT

Background: the first reported case of COVID in all of India was in Thrissur, Kerala. Kerala was one among the states which had high recovery rate, low death rate and slow progression which was recognized internationally in managing and controlling the COVID-19 pandemic. For efficient control of transmission of COVID 19, mask wearing was considered as primary and popular measure. Wearing mask every time can cause discomfort and prolonged mask usage can lead to many health impacts. Mask wearing can be made comfortable and convenient, if the discomforts and health impacts of wearing mask are worked on in future.

Objective: to study perceptions and behavioral traits related to mask usage in general population of Kerala, India.

Methods: an online crosssectional study was conducted in Kerala among 291 adults aged 20 to 60 years with a validated questionnaire. Data was analyzed with Pearson's Chi square and Odds ratio.

Results: majority of the participants were self-motivated, though 90 % of participants reported mild discomforts, yet more than 80 % were inclined to proper mask wearing practice. Among the participants, 77 % washed and reused masks, more than 49 % changed their face touching behavior, 67 % were inspired by family and friends in wearing mask. Older participants (greater than 40 years) had higher knowledge level of mask use (98 %) and wearing masks outdoors (92,8 %), lesser preference for N95 mask and double mask compared to younger participants.

Conclusion: study reinforces hypothesis of mask use efficacy in controlling and reducing pandemic spread. Community perceptions and behavioral traits study can enhance planning and implementation of public health programs.

Keywords: Kerala; Mask Use; Pandemic; Public Health; Validated Questionnaire And Online Survey.

RESUMEN

Antecedentes: el primer caso notificado de COVID en toda la India se produjo en Thrissur, Kerala. Kerala fue

uno de los estados que tuvo una alta tasa de recuperación, una baja tasa de mortalidad y una progresión lenta, lo que fue reconocido internacionalmente en la gestión y el control de la pandemia de COVID-19. Para un control eficaz de la transmisión de COVID 19, el uso de mascarillas se consideró una medida primaria y popular. El uso de mascarilla cada vez puede causar incomodidad y el uso prolongado de la mascarilla puede llevar a muchos impactos en la salud. El uso de mascarillas puede ser más cómodo y conveniente si en el futuro se estudian las molestias y los efectos sobre la salud del uso de mascarillas.

Objetivo: estudiar las percepciones y los rasgos de comportamiento relacionados con el uso de mascarillas en la población general de Kerala, India.

Métodos: se realizó un estudio transversal en línea en Kerala entre 291 adultos de 20 a 60 años con un cuestionario validado. Los datos se analizaron con Chi cuadrado de Pearson y Odds ratio.

Resultados: la mayoría de los participantes estaban auto-motivados, aunque el 90 % de los participantes informaron de molestias leves, sin embargo, más del 80 % se inclinaron por la práctica adecuada del uso de mascarillas. Entre los participantes, el 77 % lavaba y reutilizaba las mascarillas, más del 49 % cambiaba su conducta de tocarse la cara y el 67 % se inspiraba en familiares y amigos para llevar mascarilla. Los participantes de más edad (más de 40 años) tenían un mayor nivel de conocimientos sobre el uso de mascarillas (98 %) y el uso de mascarillas al aire libre (92,8 %), menor preferencia por la mascarilla N95 y la mascarilla doble en comparación con los participantes más jóvenes.

Conclusiones: el estudio refuerza la hipótesis de la eficacia del uso de mascarillas para controlar y reducir la propagación de la pandemia. El estudio de las percepciones y los rasgos de comportamiento de la comunidad puede mejorar la planificación y la aplicación de los programas de salud pública.

Palabras clave: Kerala; Uso De Mascarillas; Pandemia; Salud Pública; Cuestionario Validado Y Encuesta En Línea.

INTRODUCTION

Mask usage has been considered, as a primary and popular measure to control of COVID 19 transmission.⁽¹⁾ The usage of mask was widely promoted in general population and guidance for appropriate use was considered important during the pandemic situation.

A pandemic warrants every possible risk strategy, to be implemented for reducing the chances of spread and control.⁽²⁾ Yet, wearing mask every day, everywhere and every time was increasingly considered as an uncomfortable inconvenient method; it also, put forth worries that prolonged mask use could be dangerous.

⁽³⁾ Regular mask wearing is associated with headache, breathing difficulty, inability to tolerate physical work, inability to rely on lip reading, difficulty in identifying communicating with people.⁽⁴⁾

The potential benefits of mask usage outweigh its anticipated risk, however, does not lessen resistance to wearing mask, for prolonged periods.⁽⁵⁾ Mask usage has inherent advantages, risks and side effects; hence, education on risk of mask wearing is gaining importance.⁽⁶⁾

This cross sectional study tries to elicit factors pertinent to public guidance of mask use; the need to wear the mask, properly selecting, using and disposing mask in Kerala population, which has, the lowest mortality rate and highest recovery rate of coronavirus infections.⁽⁷⁾

The study also attempts to assess people's compliance and willingness, in wearing masks. Since, exploring tackling strategies deployed in COVID-19 is imperative to effectively deal with future calamities, hence, the study outcome is expected to benefit public health programs to maximize proper mask usage and compliance.

METHODS

A Cross-sectional study was conducted among healthy adults in Kerala from 07th December 2021 to 20th February 2022. An online questionnaire was sent via google forms, along with consent question. The Questionnaire link was sent through WhatsApp to the contacts of the investigators. Participants were encouraged to pass out google form to as many contacts as possible.

Study received ethical clearance from Institutional Research Ethics Committee (reference No. IRB/Doc/08/21 dated 16/11/21).

Participants aged between 20 and 60 years and those who were willing to participate, were included. Terminally ill patients and those for whom, mask was medically and professionally indicated were excluded.

A Structured and pretested questionnaire was used to achieve study outcomes. Review of literature was done on Pubmed using keywords- Covid 19, mask, pandemic and problems conveyed by patients in medical practice which formed the basis of questionnaire item generation. The questionnaire underwent face validity, followed by content validity. Test - retest reliability, pretesting and cognitive reasoning was carried out for validating the questionnaire.

By clicking the Google form link, the participants were directed to the study information and informed consent. The questionnaire was structured in English and translated to Malayalam, regional language of Kerala, to assure optimum participant understanding, followed by Back translation.

The questionnaire consisted of 23 questions including demographic variables, type and duration of mask use, double mask use, mask replacement time, reuse of mask, health beliefs and health impacts of mask usage.

Participants were asked “if they got rid of any previous health issues with prolonged use of mask / if their face touching behavior changed after wearing mask and if they were affected with COVID 19 even after following appropriate precautionary measures” where they could either chose ‘yes’, ‘no’ or ‘don’t know’ for their responses. There were seventeen Likert scale questions with five options corresponding to the levels of agreement/disagreement with the provided statements such as “I think wearing mask is an effective way to control COVID 19”. Responses towards these, health beliefs of mask usage were rated on a five-point scale from “strongly disagree” to “strongly agree”. A higher score indicated a positive attitude towards mask usage.

Questions focusing on frequency of behaviors such as “covering nose and mouth completely while wearing masks” were included. Responses were rated on a five-point scale from “Never” to “Always”, where, a higher score denoted positive practice.

Questions, one each for the type of face mask used during covid 19 pandemic, use of double masks, mask replacement time, replacement time of surgical mask and N95 mask were included. Multiple choice questions on health related difficulties of mask use had options rated on a five- point scale with a scoring pattern of 1= “Not at all”, 2 = “Mild”, 3= “Moderate”, 4= “Severe” and 5 = “Very Severe”. A higher score indicated the strength of difficulties such as Breathing difficulties, Pain behind ear due to mask straps.

Demographic information included age, gender, level of education and occupational status. The questionnaire required an estimated 5-7 minutes to complete.

The sample size calculated was 278 to achieve a 94 % confidence level and a 6 % margin of error. To assure a reasonable response rate, additional 5 % was added resulting in a sample of 291 adults in the general population of Kerala. On receiving the required number of responses, data collection was discontinued.

Data was analyzed using the Statistical Package for the Social Sciences (SPSS) Version 26. The examination of cross-classified category data is common in assessment and research. Karl Pearson's chi-square tests is one of the most utilized statistical analyses for answering questions about the association or difference between categorical variables. The Chi-Square test was used to measure the association of each of the factors. Odds ratios were computed to measure the strength of the association of the various factors about the use of masks.

RESULTS

Data was segregated based on age (younger and older), taking 40 years as demarcation. A higher share (92,8 %) of older participants (greater than 40 years) makes it a habit to wear masks, when going outdoors. More than 98 % of this older population know that masks help prevent Covid 19 spread, they prefer cloth masks over others. The difficulty to recognize people was a major concern among this group.

N95 mask was the most preferred mask type by higher share (32 %) of people below 40 years. This population echoed more difficulty in mask-wearing, with ear pain as the most reported concern.

Table 1. Perceptions of mask usage

Variable	Age group	
	<40	>=40
I wear a mask while going for		
Social gathering	177 (79,7 %)	43 (62,3 %)
Hospital	177 (79,7 %)	43 (62,3 %)
Going out of house	206 (92,8 %)	67 (97,1 %)
Travelling	167 (75,2 %)	43 (62,3 %)
Wearing a mask is an effective way to control COVID 19	210 (94,6 %)	68 (98,6 %)
Type of mask used		
Only cloth mask	17 (7,7 %)	8 (11,6 %)
Cloth + other	41 (18,5 %)	19 (27,5 %)
N95	71 (32,0 %)	18 (26,1 %)
N95 + others	11 (5,0 %)	2 (2,9 %)
Surgical mask	42 (18,9 %)	11 (15,9 %)
Surgical mask + others	40 (18,0 %)	11 (15,9 %)

Difficulty faced in using mask		
Difficulty to breathe	115 (51,8 %)	23 (33,3 %)
Difficulty to recognize	75 (33,8 %)	28 (40,6 %)
Difficult to communicate	64 (28,8 %)	9 (13,0 %)
Increases face temperature	86 (38,7 %)	14 (20,3 %)
Marks on nose	26 (11,7 %)	1 (1,4 %)
Ear pain	123 (55,4 %)	26 (37,7 %)
Pimples	43 (19,4 %)	2 (2,9 %)
Skin problem	21 (9,5 %)	2 (2,9 %)
Do you use double mask		
Use double mask	188 (84,7 %)	60 (87,0 %)
Don't use double mask	34 (15,3 %)	9 (13,0 %)

Almost all the participants were self-motivated to wear a mask. Ninety percent of the participants admitted having disturbances while mask-wearing, though they continued it as a protective measure. More than 80 % use double mask and were inclined to proper mask wearing practice - covering nose and mouth. Seventy-seven percent washed and reused masks. Family and friends have inspired 67 % to wear masks. Wearing masks has helped more than 49 % of participants to change their face touching behavior. The cost of the mask was hardly a financial burden.

Table 2. Behavioral Traits of mask usage

Variable	Levels	Age Group		Chi Square	Odds Ratio	P Value
		<40	>=40			
Do you wear a double mask	Yes	240 (86,3 %)	8 (61,5 %)	6,06	3,947	0,014
	No	38 (13,7 %)	5 (38,5 %)			
I cover my nose and mouth while wearing a mask	Mostly	274 (98,6 %)	12 (92,3 %)	2,88	5,708	0,09
	Rarely	4 (1,4 %)	1 (7,7 %)			
I wear a mask even if no one around me wears one	Agree	259 (93,2 %)	6 (46,2 %)	33,73	15,904	<0,001
	Disagree	19 (6,8 %)	7 (53,8 %)			
I wear a mask noticing everyone around me wears one	Disagree	258 (92,8 %)	9 (69,2 %)	9,12	5,733	0,003
	Agree	20 (7,2 %)	4 (30,8 %)			
Self-motivation	Agree	270 (97,1 %)	9 (69,2 %)	24,44	15	<0,001
	Disagree	8 (2,9 %)	4 (30,8 %)			
Would wear a mask while going out	Yes	264 (95,0 %)	9 (62,9 %)	14,17	8,381	<0,001
	No	14 (5,0 %)	4 (30,8 %)			

The odds ratio was computed for following influential factors. People who consider wearing a mask as an effective measure to control Covid 19 also opt for double masks (3,9), follow proper mask wearing practice (5,7), wear a mask even if no one around wears one (15,9), are self-motivated to wear a mask (15,00) and would always wear a mask while moving out of the house (8,4).

Almost triple the number of participants in the less than 40 years age group wore double masks compared to those who don't use them. The odds ratio also indicates the awareness of proper use of masks, self motivation and self- discipline among this population.

DISCUSSION

We explored socio-behavioral traits coupled with personal choices, concerning mask use in Kerala population where, timely communication of pandemic-related health risk information and inculcating individual responsibility has generated benchmark public acceptance and compliance in COVID Control.⁽⁸⁾ Our study supports mask use as an effective population strategy for meaningful disease control and elimination.

Perception related to mask wearing, are complex and arguably reflect preventive behavioral traits which emerge from trained awareness, willingness, intelligence and compliance. Howard MC, who had worked upon perception scale in face mask wearing assert that 'one size fits all' strategy is futile in mask wearing and

emphasizes on specific perception and warns against blind faith in most common perceptions.⁽⁹⁾

Question on different types of mask were included considering difference in opinion regarding mask types. The use of N95 masks were noted as most predominant among study participants, which synchronizes with the previous study findings.⁽¹⁰⁾ We observed a second preference for cloth mask, probably because they can be reused, is environment friendly and are cost effective.⁽¹¹⁾

Good mask wearing practice was also seen among majority of participants, who opted to cover both mouth and nose.⁽¹²⁾ Risks and difficulties of wearing masks are intensified with increased wearing time (greater than 6 hours) and habit of mask wearing for more than 6 hours, has surfaced in our study.⁽¹³⁾

Kerala has, equitable highly ranked health and education status, comparable to global standards, coupled with experience obtained from tackling a series of previous viral assaults. Understandably, the knowledge level of study participants, about mask use in effective control of COVID 19, delivered appreciable outcome. The high education level of participants, was positively inclined towards mask use, as surfaced in previous studies.⁽¹⁴⁾

Researches report female participants being more inclined to a protective measure of mask wearing, revealing gender equation in pandemic era, but, our study could not, elicit a similar pattern.⁽¹⁵⁾

Chances of disease severity, being higher in older individuals, fear factor and awareness might have interplayed for inclining older individuals toward mask wearing, compared to younger participants.⁽¹⁶⁾ The potential hazard of high risk embarking attitude, among younger individuals during the pandemic is well studied.⁽¹⁷⁾

Mask shortage marked the pandemic scenario in the early phase, however during the study period participant adaptive method, along with sufficient mask availability and affordability has prompted for liberal mask usage.⁽¹⁸⁾

Occurring, reoccurring, intensifying headaches and ear aches may be attributed to tight fitting mask with elastic straps, which cause pain behind ears, calling for mask designs appropriate for daily long hour use.⁽¹⁹⁾

The itching was reported in earlier studies, which prompted touching of face.⁽²⁰⁾ Our study, done in terminal pandemic phase, reports minimal itching and face touching tendency.

The study also revealed recognition issue with mask use. Face masks are known to hinder face recognition, probably because faces are perceived as a whole, rather than parts of holistic processing, as hypothesized by many researchers.⁽²¹⁾

Study hints towards knowledge percolating to the masses, accepting health behavior and installing community practice, to the extent that it overcomes discomforts encountered. Comfort perception is developed through personal experience and the discomfort associated, is the perceived discomfort, which is overruled by adaption for protection.

Expressed community behavior may have socio cultural and geo political explanations. In Kerala, during the pandemic, the administration played a cardinal role, in assisting, empowering public and strictly dealing with unacceptable deviations of safety breach. Compulsory mask wearing recommendations were anticipated, to evoke negative public responses, stemming out of the assault on autonomy.⁽²²⁾ A current study reveals reconciliation mode in public, towards mandatory mask wearing, probably due to human adaptability behavior and social acceptance, which had globally set in the study period.⁽²³⁾ Appreciable self-motivation might have triggered many participants to wear the mask, even when they were alone. Whereas, wearing masks when others do, may be due to human behaviors of imitating group norms.⁽²⁴⁾

Our study agrees with the fear component of a pandemic, which could have an impact decision making ability, extent of civic responsibilities and influences, response to control guidelines.⁽²⁵⁾

A heightened sense of personal hygiene was revealed, amidst sequels of pandemic related panic, which might be influenced by family and peer support in health behavior change in adverse scenario.⁽²⁶⁾

Compliance with protective health behaviors may be related to choice of informative communication.⁽²⁷⁾ Risk perception governs compliance, and the pandemic scenario has improved compliance.⁽²⁸⁾ Substantial compliance with mask wearing can be related to its acceptance as socio cultural entity; not merely a medically indicated practice. However, encouraging compliance for mask wearing as shown by the odds ratio of 15 in our study, needs to be interpreted cautiously, because of social desirability bias along with hidden guilt and shame of non wearing a mask.⁽²⁹⁾

Limitations

Our study carries the burden of inherent bias, of online survey's inability to state causal relationship, both advocating, guarded generalization. The study, is not free from subjective bias incorporated by participant perception. We had refrained from questions closely related to mask use; hand hygiene, and physical distancing and thereby, are rendered clueless, regarding the probable risk compensation behavior in population.

CONCLUSION

Face mask perceptions and behaviors call for diverse theoretical frameworks. The study reinforces the hypothesis of widespread mask use efficacy, in controlling and reducing community disease spread. Impressive

awareness, motivation and practice in mask wearing of our study, emphasizes the health utilitarians- where every person's health behavior improves every other person's health. Public participation in mask wearing can be seen in positive health behavior coining solidarity, efficacy and positive temperament.

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