

Adapting to the New Norms: A Year of COVID-19 Preventive Practices in Malaysia

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Abstract

The global fight against COVID-19 has persisted for over a year, and ongoing adherence to preventive measures must continue to be closely monitored. This study aimed to evaluate the knowledge and practices related to COVID-19 prevention among the Malaysian population one year into the pandemic. A questionnaire-based survey was conducted with 2,558 adult participants in Malaysia, focusing on understanding and implementing preventive measures. The mean practice score was 7.9 ± 0.99 (out of a maximum score of 9). Medical masks were the most commonly used when leaving the house ($n = 1792$, 70.1%). Most participants reported wearing masks regularly ($n = 2284$, 89.3%), while 51.8% ($n = 1325$) sometimes sanitized their hands, and 56.9% ($n = 1456$) consistently followed the one-meter social distancing guideline. The mean score for mask-related knowledge was 11.1 ± 1.9 (out of a maximum score of 15), while the mean score for other preventive measures was 5.7 ± 0.7 (out of 6). A positive and significant correlation was found between knowledge of preventive measures and actual practices ($P = 0.1$, 95% CI = 0.02-0.01, $P = 0.03$), indicating that better knowledge leads to improved preventive behavior. The findings of this study emphasize the need for continued public education on COVID-19 preventive measures in Malaysia, as well as the need for targeted interventions to improve practice and encourage behavioral changes.

Keywords: COVID-19, Coronavirus, Infection, Pandemic, Prevention, Virus

Introduction

The novel coronavirus, known as SARS-CoV-2, which causes the disease COVID-19, has spread rapidly across the globe, presenting a major public health challenge [1-3]. With the current global case count surpassing 60 million and over a million deaths reported, the pandemic's impact is undeniable [4]. The virus has an incubation period ranging from 1 to 14 days, with mild symptoms like cough, fever, and shortness of breath affecting approximately 80% of those infected [5]. However, 15% of cases develop more severe symptoms, and 5% require critical care [5]. In the most severe cases,

patients may experience severe respiratory distress, kidney failure, or even death [5]. Due to the rapid spread of the virus and the absence of an effective pharmacological treatment, managing COVID-19 patients has become increasingly complex.

Preventive measures have become a cornerstone in managing the COVID-19 pandemic, with wearing medical masks in crowded areas being a key recommendation. Wearing face masks during severe outbreaks can offer partial protection, helping to reduce the spread of the virus [6]. Since the pandemic began, the widespread use of masks has been adopted in several Asian countries, including Malaysia, South Korea, China, and Japan. In Malaysia, the government has made it mandatory for people to wear masks in public spaces to help control the virus's transmission [7]. As a result, there has been a significant increase in mask usage within the community, contributing to a global shortage of face masks. Coupled with rising prices, this situation is

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creating supply challenges for both healthcare workers and the general public [8].

As a result, in certain areas, the public has resorted to makeshift solutions like reusing disposable medical masks or opting for reusable cloth masks [9]. Limited research has been conducted on the effectiveness of these alternative masks. In studies assessing influenza-like illnesses among healthcare workers, Cloth masks were found to offer the lowest level of effectiveness when compared to standard medical masks [10]. However, recent evidence suggests that cloth masks could still offer some protection, especially when made from tightly woven fabrics with low porosity, such as high-thread-count cotton sheets [11]. In response to the ongoing COVID-19 pandemic, the WHO has advised that three-layer non-medical or fabric masks may be used by the general public in situations where medical masks are unavailable [12]. Nevertheless, medical masks are still recommended for vulnerable groups, including the elderly and those with weakened immune systems [13]. Additionally, it is important to educate the public on the correct way to wear, remove, and dispose of masks. Incorrect use, such as failing to replace disposable masks or not washing cloth masks, can reduce their effectiveness and potentially increase the risk of infection. While mask-wearing is mandatory, the WHO warns that it might create a sense of false security, leading people to overlook other essential preventive measures [13].

In addition to wearing masks, other preventive actions are strongly advised to help reduce the spread of the virus, including maintaining physical distance and practicing proper hand hygiene [13, 14]. When combined, these measures—physical distancing, hand hygiene, and mask usage—have proven effective in minimizing the impact of COVID-19 [15]. Even though, despite public education efforts, a notable portion of individuals still neglect to follow proper hand hygiene practices [16]. This lack of adherence to hand hygiene was observed even among those with a good understanding of COVID-19 prevention methods [16].

To effectively control the spread of COVID-19, it is crucial to ensure the accurate dissemination of information. While Malaysia has implemented strict guidelines regarding mask usage, hand hygiene, and physical distancing, there is limited knowledge about how well the public understands and practices these measures one year into the pandemic. Several communication methods have been employed to inform

the public, such as regular updates via television, social media, radio broadcasts, and daily briefings by the Ministry of Health during press conferences. Early studies conducted in the first months of the pandemic showed that around half of Malaysians were not wearing masks, although most reported following hand hygiene recommendations [17]. But, maintaining long-term adherence to preventive measures is essential as the world continues to fight to reduce infection rates. Given the need to assess ongoing compliance and the limited research on public knowledge and practices regarding preventive measures a year after the outbreak, this study aims to examine how well the public in Malaysia understands and follows COVID-19 preventive measures. The goal is to evaluate whether the information being provided is effectively reaching the public, addressing the gaps observed in the initial stages of the pandemic [17].

Materials and Methods

Study design

Our study is a prospective, cross-sectional study conducted in 2020, targeting the public in Malaysia. Our research utilized a questionnaire-based approach and focused on adults aged 18 and older who could read and write in either English or Malay and who provided informed consent. Any incomplete responses were excluded from the analysis. Data collection was carried out using a validated survey, which was distributed online through email and various social media platforms to reduce direct, in-person contact. A snowball sampling method was employed, where initial participants were selected online and then encouraged to recruit additional participants by sharing the questionnaire. This process continued until the required sample size was reached. However, respondents were informed that the recruitment of additional participants was optional.

Ethical approvals

This research was conducted with approval from the relevant ethics committees at both the institutional and national levels, adhering to the principles outlined in the 1964 Declaration of Helsinki and its later revisions, or equivalent ethical guidelines. The study received approval from the Malaysia Research Ethics Committee (JEP 2020-654) and the Ministry of Health's Medical Research and Ethics Committee (NMRR-20-2328-56946).

Sample size

The study aimed for a sample size of 384 participants, based on a 5% margin of error and 95% confidence interval, considering the adult population of Malaysia at 20 million [18]. To accommodate potential exclusions and additional data analyses, the target was set at a minimum of 500 participants.

Questionnaire

The questionnaire consisted of four parts. The first part gathered socio-demographic details of participants, including gender, age, ethnicity, presence of chronic health conditions, whether they were healthcare workers and the type of mask they used when leaving home. The second section evaluated adherence to COVID-19 preventive measures with three specific questions: Do you wear a mask when leaving the house? Do you frequently sanitize your hands when out? Do you maintain a one-meter distance from others? Participants responded using a three-point Likert scale: 3 for "Always," 2 for "Sometimes," and 1 for "Never." The total score for these responses was calculated, with higher scores indicating better adherence to the practices. The third section included Yes/No questions addressing any issues faced while wearing a mask, such as frequently touching the mask, headaches, breathing difficulties, skin irritation, rashes, acne, trouble communicating, and general discomfort.

The second section evaluated the public's understanding of mask usage according to the WHO's recommended practices for mask management [12, 13]. It consisted of fifteen statements regarding mask use during the pandemic. Respondents could choose from three options: true, unsure, or false. Correct responses were scored as 1, while incorrect or uncertain answers received a score of 0. The total score was calculated, with higher scores indicating better knowledge of mask use.

In the third section, participants' awareness of additional COVID-19 preventive measures, as per WHO guidelines [14], was tested. This section included six statements, with participants selecting from true, unsure, or false options. Each correct response earned a score of 1, while incorrect or unsure responses were marked as 0. The overall score was tallied, with higher scores showing

greater knowledge of the recommended prevention practices.

Overall score calculation

The total knowledge score on COVID-19 prevention was derived by combining the scores from both mask usage and other preventive practices. A higher total score indicated a better understanding of the prevention measures.

Questionnaire development

The questionnaire was crafted in alignment with WHO guidelines for public COVID-19 prevention recommendations [13, 14]. To ensure its validity, a panel of five hospital pharmacists conducted face and content validation. Their feedback was used to refine the clarity, presentation, and consistency of the questionnaire. After modifications, a pilot test was carried out with 40 participants. The Cronbach's alpha values for knowledge of the use of masks and other preventive measures were found to be 0.72 and 0.82, respectively.

Statistical analysis

Data analysis was conducted using SPSS software version 23.0 (IBM Corp, Armonk, NY, USA). Descriptive statistics were applied to assess demographic details, preventive practices, and knowledge regarding mask use and other COVID-19 prevention strategies. The relationships and differences between sociodemographic factors, practices, and knowledge were examined using Student's t-test, ANOVA, Chi-squared tests, and Pearson correlation. A P-value of less than 0.05 was considered statistically significant.

Results and Discussion*Socio-demographic characteristics*

The study involved 2558 participants, with ages spanning from 18 to 90 years (**Table 1**). The majority of respondents were female (n = 1841, 72%), Malay (n = 1819, 71.1%), and did not report having a chronic illness (n = 2214, 86.6%). There was an almost equal split between healthcare workers (n = 1127, 44.1%) and non-healthcare workers (n = 1431, 55.9%).

Table 1. Socio-demographics of the study population (n = 2558)

Data	Value/Mean	%/SD
Gender		

Male	717	28.0%
Female	1841	72.0%
Age, years	34.5	± 11.9
Ethnicity		
Malay	1819	71.1
Chinese	42	16.5
Indian	143	5.6
Others	175	6.8
Chronic illness		
Yes	344	13.4
No	2214	86.6
Healthcare personnel		
Yes	1127	44.1
No	1431	55.9

COVID-19 prevention practices

The prevention practices related to COVID-19 are outlined in **Table 2**. The mean practice score was 7.9 ± 0.99 (with scores ranging from 3 to 9, where 9 was the highest possible score). Regarding mask usage while leaving the house, medical masks were the most commonly used by respondents ($n = 1792$, 70.1%). Most participants reported wearing masks consistently ($n = 2284$, 89.3%). However, only about half of the respondents ($n = 1325$, 51.8%) practiced hand sanitization regularly. Additionally, 1456 individuals

(56.9%) always adhered to the one-meter physical distancing guideline.

The main issue experienced while wearing masks was discomfort ($n = 1361$, 53.2%), then the habit of frequently touching the face ($n = 1132$, 44.3%). Other reported problems included fogging of glasses ($n = 68$, 2.7%), ear pain ($n = 18$, 0.7%), a runny nose ($n = 13$, 0.5%), facial sweating ($n = 12$, 0.5%), poor mask fit or movement while speaking ($n = 9$, 0.4%), high mask costs ($n = 3$, 0.1%), nausea ($n = 2$, 0.08%), and dry lips ($n = 1$, 0.04%).

Table 2. COVID-19 prevention practices of the study population ($n = 2558$)

Data	No.	%
Type of mask used		
Cloth	105	4.1
Medical	1792	70.1
Cloth and medical	648	25.3
None	13	0.5
Do you wear a mask?		
Always	2284	89.3
Sometimes	266	10.4
Never	8	0.3
Do you sanitize your hands?		
Always	1226	47.9
Sometimes	1325	51.8
Never	7	0.3
Do you comply with social distancing?		
Always	1456	56.9

Sometimes	1100	43.0
Never	2	0.1
Problems with wearing the mask		
Always touching face	1132	44.3
Headache	90	3.5
Difficulty breathing	822	32.1
Facial skin irritation	657	25.7
Facial acne	714	27.9
Difficulty communicating	825	32.3
Discomfort	1361	53.2
Others*	126	4.9

*Includes foggy glasses, ear pain, runny nose, facial sweating, masks not fitting properly or shifting during the speech, high cost, nausea, and dry lips.

A further examination of the socio-demographics and prevention practices revealed notable patterns. Age significantly impacted mask choice ($F = 17.9$, $df = 3$, $P < 0.001$), with younger participants preferring a combination of medical and cloth masks or solely medical masks. In contrast, older respondents tended to use cloth masks or no masks at all. Ethnicity also played a role, with Chinese and Malay individuals more likely to use medical or cloth masks compared to others ($\chi^2 = 24.9$, $df = 9$, $P = 0.003$). Participants with chronic illnesses were more inclined to use cloth masks, while healthcare workers favored medical masks over non-healthcare workers ($\chi^2 = 40.5$, $df = 3$, $P < 0.001$).

Aging participants consistently wore masks (34 ± 11.9 years), in contrast to younger respondents (28.5 ± 9.4 years) who did not wear masks ($F = 21.5$, $df = 2$, $P < 0.001$). Among genders, males were slightly more likely to skip wearing masks (0.42%), while only 0.27% of females reported the same behavior ($\chi^2 = 14.9$, $df = 2$, $P < 0.001$). Healthcare workers also had a higher frequency of occasionally wearing masks (12.5%) compared to non-healthcare workers (8.7%) ($\chi^2 = 9.8$, $df = 2$, $P = 0.007$). Additionally, those with chronic conditions were more

inclined to skip wearing masks (0.87%) compared to participants without chronic conditions (0.23%) ($\chi^2 = 19.0$, $df = 2$, Fisher exact; $P < 0.001$).

When it came to sanitizing hands, those who frequently used hand sanitizer were generally older (35.2 ± 11.7 years) compared to younger respondents who did not use it (28.9 ± 8.1 years) ($F = 21.5$, $df = 2$, $P < 0.001$). Those with chronic illnesses were also found to be less compliant with social distancing, as indicated by a small percentage of 0.58% not adhering to the one-meter rule, compared to 0% of those without chronic illnesses (Fisher's exact; $P = 0.002$).

Mask usage awareness

The data on mask usage awareness is presented in **Table 3**. A large proportion of participants ($n = 2507$, 98.0%) understood that masks should be used by a single person and that they need to cover both the mouth and nose, with minimal gaps between the mask and face ($n = 2470$, 96.6%). However, a smaller percentage ($n = 714$, 27.9%) knew that they should wash the cloth masks at the maximum recommended temperature.

Table 3. Knowledge of the use of masks among the study population ($n = 2558$)

Statements	True, n (%)	Unsure, n (%)	False, n (%)
Masks should be used by one person	2507 (98.0)	21 (0.8)	20 (1.2)
Wash hands before putting on a mask	2394 (93.6)	128 (4.9)	36 (1.4)
Mask must cover mouth, and nose, minimize gaps	2470 (96.6)	53 (2.0)	35 (1.4)
Hands must be sanitized after removal	2421 (94.6)	102 (4.0)	35 (1.4)
Replace damp masks with dry ones	2427 (94.9)	70 (2.7)	61 (2.4)
Do not reuse disposable masks	2434 (95.2)	67 (2.6)	57 (2.2)

Discard disposable masks immediately after use	2321 (90.7)	129 (5.0)	108 (4.2)
Cloth masks must have three layers	2129 (83.2)	351 (13.7)	78 (3.0)
Washcloth masks with soap	1589 (62.1)	747 (29.2)	222 (8.7)
Cloth masks should not be washed	302 (11.8)	178 (7.0)	2078 (80.2)
Washcloth masks at the highest temperature	714 (27.9)	1016 (39.7)	828 (32.4)
The inner layer of the cloth mask resists droplets	1262 (49.3)	680 (26.6)	616 (24.1)
The outer layer of the cloth mask absorbs liquid	663 (25.9)	726 (28.4)	1169 (45.7)
Do not touch the mask while wearing	2204 (86.2)	197 (7.6)	157 (6.1)
Remove the mask from the front, untie the back	1002 (39.2)	593 (23.2)	963 (37.6)

The average knowledge score for mask usage was 11.1 ± 1.9 , with a score range from 0 to 15 (maximum score of 15). Upon closer examination, women had a higher average score (11.2 ± 1.9) compared to men (10.9 ± 2.0) ($t = 3.9$, $df = 2556$, $P < 0.001$). Healthcare workers demonstrated better knowledge (11.4 ± 1.9) than non-healthcare workers (10.9 ± 1.8) ($t = -7.5$, $df = 2556$, $P < 0.001$). No further significant differences were found between other socio-demographic characteristics and the knowledge of mask use.

Knowledge of COVID-19 preventive measures

Most of the participants were aware of the need to keep at least a one-meter distance from others ($n = 2530$, 98.9%). However, only a small number ($n = 286$, 11.1%) were unaware that avoiding crowded places was necessary.

The mean score for knowledge of other preventing measures was 5.7 ± 0.7 , with a score range from 0 to 6 (maximum score of 6). Female participants scored significantly higher (5.76 ± 0.57) than males (5.60 ± 0.84) in their knowledge of preventing measures ($t = 5.33$, $df = 2556$, $P < 0.001$). No major differences were found between socio-demographic characteristics and the scores for other preventive measures.

A correlation analysis between prevention practice scores and the total knowledge score on COVID-19 preventive measures showed a significant positive relationship ($Rho = 0.1$, 95% CI = 0.02-0.01, $P = 0.03$). This suggests that as knowledge of preventive measures increased, so did the practice of those measures.

One year into the COVID-19 pandemic, cases continue to rise globally and locally [4]. With strict measures in place in Malaysia, cases have increased [4]. Currently, preventing the spread of COVID-19 relies on various preventive measures, often referred to as the new norm [7, 15, 16]. While many countries use similar methods,

such as mask-wearing, hand hygiene, and social distancing, the level of compliance varies [15, 16]. Though prevention strategies are in place, understanding the public's compliance is essential for improving current practices. Limited data exists on the practices and knowledge of COVID-19 prevention in Malaysia a year into the pandemic, with most studies focusing on the early stages of the crisis [17]. The aim of this study was achieved by highlighting that the level of compliance with prevention practices and knowledge among Malaysians could be significantly improved, even a year after the pandemic began.

Masks have been a cornerstone of COVID-19 management, aimed at reducing the spread of droplets within the community [18]. In Malaysia, mask-wearing has been made mandatory in public and crowded spaces, with specific guidelines on usage [7]. However, not everyone in the study population adhered to this measure, despite ongoing government reminders [7]. Approximately one-quarter of participants reported that they only occasionally wore masks when leaving their homes. Similar to previous research [19], side effects such as discomfort were commonly reported by respondents, possibly contributing to non-compliance. While the main reasons for non-compliance remain unclear, a closer look at demographic trends reveals patterns similar to those found in earlier studies [20, 21]. Younger male respondents, for instance, were less likely to wear a mask compared to older individuals. On the other hand, although older respondents were more likely to wear a mask, cloth masks were preferred over medical ones. The use of cloth masks has sparked debate, with few studies supporting their effectiveness. Nonetheless, in situations where medical masks may be scarce or expensive [22], cloth masks made of at least three layers of tightly woven fabric can offer an alternative for filtration [12]. Despite the widespread use of cloth masks

in this study, many participants did not know the stringent requirements for effective non-medical masks. This highlights the need for better public education regarding the proper use of cloth masks, particularly the importance of the three-layer design for adequate protection.

Hand hygiene plays a crucial role in preventing the transmission of infections during the COVID-19 pandemic. Using soap and alcohol-based hand sanitizers is among the most efficient and simple practices for reducing the spread of germs [23]. Soap, detergent, or alcohol works by disrupting the lipid membrane of enveloped viruses, killing the microorganisms [24]. Alcohol-based rubs containing at least 60% ethanol are effective for maintaining hand hygiene [23]. However, the World Health Organization (WHO) recommends using ethanol with a concentration of 80% or isopropanol at 75% during the pandemic [25]. Most participants in the study recognized the importance of strict hand hygiene, yet only about half of the respondents reported consistently following the guidelines. This aligns with findings from previous studies [17], as well as research conducted on adults in Poland, where only half adhered to hand hygiene practices during COVID-19 [16]. Mask-wearing can sometimes contribute to a false sense of security, affecting compliance with hand hygiene [12].

In addition to mask-wearing and hand hygiene, other preventive actions such as maintaining social distancing, avoiding crowded spaces, and covering the mouth while coughing or sneezing are key strategies to curb the spread of COVID-19 [14, 25]. These measures are most effective when practiced together, rather than relying on any single method alone. While respondents generally recognized the need for precautions, only half adhered to the one-meter social distancing rule. The reasons behind non-compliance with this distancing rule remain unclear. Although females tended to follow these guidelines more frequently, other factors beyond demographics—such as personal circumstances—may influence adherence. Social distancing is based on the understanding of how droplets are emitted while speaking, and more forcefully when coughing or sneezing [26]. Maintaining at least a one-meter distance has been shown to lower the risk of transmission, though the effectiveness can vary depending on the environment, crowd density, contact time, and mask usage [27].

With these in mind, preventive measures have led to significant lifestyle changes for the public, which could persist for many months or even years, it is essential to

understand the factors that facilitate or hinder their adoption. This understanding is particularly important, as both earlier studies [17] and the current research, conducted 1 year in the pandemic, show that while most people are aware of the correct preventive measures, adherence to these practices remains somewhat insufficient. The positive correlation between knowledge and actual practice further emphasizes the importance of ongoing education. In Malaysia, the government has employed an organized approach to disseminate information, using frequent text messages, social media campaigns, and broadcasts on TV and radio, which likely contributed to the widespread knowledge of preventive measures. Despite this, ensuring proper implementation of these practices continues to be challenging, as it ultimately depends on individuals taking personal responsibility. The low compliance rates could increase the risk for the country for potential surges in infections [28, 29].

This study is the first to assess both the knowledge and practice of COVID-19 preventive measures among Malaysians 1 year into the pandemic. However, as with all survey-based studies, there are certain limitations. The findings rely on the honesty of respondents, and the convenience sampling method, which primarily recruited participants through social media, may limit the generalizability of the results. The sample was also predominantly female, and individuals without access to the internet or social media may not have been adequately represented. Additionally, the study only explored a few socio-demographic characteristics, leaving out other important factors such as behaviors, facilitators, and barriers. Therefore, caution should be exercised when generalizing the results.

Conclusion

Adjusting to the new social norms is crucial for reducing COVID-19 transmission. As the risk of COVID-19 cases persists, additional actions are needed to enhance current preventive practices. The results from this study suggest that future initiatives should focus on fostering a positive behavioral shift towards adherence to COVID-19 prevention strategies. Such interventions could include emphasizing empathy and highlighting the consequences of non-compliance. Considering the complex and varied reasons behind non-adherence to public health guidelines, ongoing evaluation, and education are

necessary to maintain the long-term success of preventive measures.

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