Frequency of face touching with and without a mask in pediatric hematology/oncology health care professionals

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Abstract
The impact of wearing a mask on face-touching behavior is unknown. We conducted a survey of pediatric hematology/oncology staff to assess the perception of how masks would affect face-touching behavior and a brief observational study of providers during conferences in a children's hospital to quantify how masks affect face-touching behavior. Most felt that the mask would either increase (37.4%) or decrease (36.6%) their face-touching behavior. During a total of 330 person-minutes of observation, median face-touching rate was 5.4 face touches/hour (FT/h) while wearing a mask and 20 FT/h without a mask. Masks may reduce face-touching behavior amongst health care professionals.

KEYWORDS
adaptive behavior, hygiene, mask

1 | INTRODUCTION

The current coronavirus disease 2019 (COVID-19) pandemic has led to numerous changes for all of us, including in pediatric hematology/oncology. Emergency stay at home orders, social distancing, and hygiene measures are all efforts to reduce transmission of this deadly virus. The most recent hygiene practice implemented was the recommendation to wear masks.

Prior to April 3, 2020, the public health message in the United States (US) from the Centers for Disease Control (CDC) had been that people do not need to wear masks unless they were sick. On February 29, the US Surgeon General tweeted that masks “are NOT effective in preventing the general public from catching coronavirus.” These recommendations were based on data available at the time and on concern for supply shortages. Additionally, some suggested that the general public did not know how to wear the masks properly and they may touch their face more in the process of wearing masks. For example, the US Surgeon General said on March 2, "Folks who don’t know how to wear them properly tend to touch their faces a lot and actually can increase the spread of coronavirus.”

On April 3, due to increasing concerns regarding asymptomatic and presymptomatic spread, the CDC recommended all people in public areas wear face coverings, encouraging the general public to use cloth coverings and to reserve the surgical and N95 masks for hospital personnel. More recent data show that masks are very important in reducing COVID-19 transmission. Face touching is thought to increase the risk of infection through transfer of droplets to the hands that can be passed to others. Therefore, providing evidence about risks or benefits of wearing face masks seems important.

We conducted a brief survey to assess health care providers and staff’s impressions on the effect of donning a mask on face-touching behavior and a brief observational study to evaluate the impact of wearing a mask on face-touching behavior.

2 | METHODS

A one-question survey was sent to 187 people on our pediatric hematology/oncology (including bone marrow transplant) health care team email list at UCSF Benioff Children's Hospital using Qualtrics. This email group includes attendings (34), fellows (10), nurse practitioners (14), nurses (58), pharmacists and other care providers (22),
clinical research coordinators (15), social workers (5), and administrators (29). The survey simply asked:

“When you are wearing a mask, do you feel like you touch your face: Less often than you do without a mask, same frequency as you do without a mask, or more often than you do without a mask?”

The responses were anonymous. Respondents had one week (April 29-May 5, 2020) to answer the survey, and two email reminders were sent over the week to complete the survey.

We also monitored health care providers, including nurses, social workers, pharmacists, residents, fellows, and attending physicians, who participated in four weekly clinical meetings in a conference room. Because of the pandemic, attendance in the room was restricted to essential care providers (four to eight people) and other "nonessential" providers joined the meeting remotely using videoconferencing. The providers in the room knew they could be seen by all remote participants. A single observer remotely monitored all the providers seated in the conference room whose faces could be easily observed. There were six observation sessions during these four meetings where people were monitored for at least 5 min and up to 15 min per session. If someone entered the room, they were included in the observations. The number of health care professionals in the room as well as the number wearing a mask was quantified. Some individuals either put on a mask or took off the mask during the observation time. The amount of time each person wore a mask was noted. The observation sessions occurred between April 3, shortly after the hospital began providing all providers with surgical masks on entry into the hospital (but gave limited instruction on when and where the providers were supposed to wear the masks), and April 24, the last meeting before the hospital mandated that masks were to be worn throughout the day while in any area of the hospital (including conference rooms).

A touch to the face was only recorded if the person’s hand touched the facial region, including skin, mask (if worn), and/or glasses, from chin to forehead between and including the ears. Touches due to eating or drinking were not included. Touches of the hair or neck were not included.

The face touches (FT) per hour (h) was calculated for providers with and without a mask. Summary and descriptive statistics, including box plot, were generated using Stata (version 15).

3 RESULTS
A total of 131 (70%) people responded to the anonymous survey, which showed that most felt wearing a mask would change their number of face touches. An almost even number of respondents felt the mask would increase their face-touching behavior (37.4%) as decrease it (36.6%). Fewer felt masks would not change their face-touching behavior (26.0%) (Figure 1).

The total person-minutes of observation was 330: a total of 269 person-minutes with a mask, and 161 person-minutes without a mask. There were a total of 40 health care professionals observed; 24 who were wearing masks most of the time and 16 who were not. There were six different observation sessions ranging from 20 person-minutes to

FIGURE 1 There is a disparate distribution of responses to the survey. Most respondents feeling the masks would have some effect on the frequency of face-touching behavior

FIGURE 2 Boxplot displaying the range of face-touching rates in health care professionals wearing a mask (blue) and not wearing a mask (red): the minimum value (lower whisker), the first quartile (bottom of box), the median (line in box), the third quartile (top of box), and the maximum value (top whisker). FT, face touches

120 person-minutes. The total face touches were 83, with 29 face touches in health care professionals wearing a mask and 54 face touches in health care professionals not wearing a mask.

The median FT/h for health care providers wearing a mask was 5.4 (2.3-17.8) compared to 20 (12.8-22.9) for health care providers not wearing a mask (Figure 2).

4 DISCUSSION
One of the important measures to reduce transmission of respiratory viral infections like COVID-19 is to avoid touching your face.7 Face touching is a frequent, unconscious behavior, and one which some think could be aggravated by donning a face mask. We found that even during a period when face touching was discouraged, it remains a problem, but that wearing a mask may reduce the frequency.

Face-touching behavior is a natural part of our communication, so the study of how to reduce it is important. Spontaneous face touching tends to increase in stressful situations and may be a natural
form of stress release. Establishing effective measures to reduce this ingrained habit are not trivial, but may include education, appropriate messaging, behavior modification techniques, and potentially the use of barriers, like masks. Since face-touch gestures may have both psychological importance and nonverbal communication cues but also may have infectious risks, more thorough investigations are warranted to assess measures to reduce face touching in the most beneficial way.

In this study, those wearing a mask touched their face a median of 5.4 FT/h compared to 20 FT/h in those without a mask. Similar results have been found in other studies. A study of medical students found the students touched their face an average of 23 FT/h. Another study of clinicians and staff found that they touched their face an average of 19 FT/h. In a study of volunteers who were videotaped and told they were being monitored for surfaces they touched, they were found to touch their eyes, nose, or mouth an average of 15.7 FT/h. All of these studies highlight the importance of frequent hand washing.

While there are significant limitations of this brief observational study, it does suggest that masks can be worn by health care professionals without increasing face-touching behavior, like some have previously thought or suggested. The small number of individuals observed, the limited observation time in one behavioral setting, and the human observational error may bias the results. It is possible, the people not donning masks are individuals who unconsciously touch their face more frequently. It is also possible that transitioning from a clinical to a nonclinical environment may have altered face-touching behavior. Also, if observation were conducted for additional time, the difference in face touches between those wearing and not wearing masks might have been different. However, additional comparable data collection was not feasible after the hospital implemented a mandatory practice of wearing masks at all times while in the hospital. Additionally, this study involved health care professionals who are more used to wearing masks, and there should be caution in extrapolating these findings to the lay public.

This study did not quantify the number of touches to eyes, nostrils, or mouth separately. These mucous membrane areas are the highest risk zones for viral transmission. However, the physical barrier of the mask to the nose and mouth would be expected to reduce the opportunity to touch these mucous membrane surfaces. Thus, the masks would be expected to even further reduce contact touches to the high-risk zones.

Wearing a mask is now recommended by the CDC to reduce transmission of COVID-19. Contrary to perception of some health care professionals, wearing a surgical mask was associated with decreased facial touching in this small and limited study. Given the importance of facial touching in the transmission of respiratory infections, continued hand hygiene remains paramount.

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CONFLICT OF INTEREST
The authors declare that there is no conflict of interest.

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