Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Brief Report

Psychosocial correlates of face-touching mitigation behaviors in public and private

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This study investigates psychosocial factors that influence people's face-touching mitigation behaviors. A nationwide survey was conducted online, and the results showed that perceived risk severity of touching face, and barriers and self-efficacy of not touching face were stable predictors. COVID-19 was related to a higher likelihood of mitigation behavior in public spaces. This study provides important implications to health communication and promotion for COVID-19 and general infection control.

Limiting face-touching is one way to control the spread of infectious diseases. Early in the COVID-19 pandemic, public health messages promoted hand hygiene and limiting face-touching,[1] as contaminated hands contacting the face is a major mechanism of viral self-infection for numerous diseases.[2–4] A review of facial self-touching research suggested the need for more studies examining how face-touching behavior might be reduced,[5] noting that perceived severity of infection might reduce face-touching,[6] though few studies have investigated psychosocial correlates of conscious efforts to reduce direct face-touching (eg, using a cloth instead of one's fingers or hands to touch one's face).

To address this gap in the current literature, the present study investigated whether psychosocial variables taken from the health belief model (HBM)[7] associate with intentions to mitigate direct face-touching in public and private environments (RQ). These variables include perceived susceptibility and severity of the risk of face-touching, perceived barriers to and benefits of not touching one's face which depict the evaluation of the recommended health behavior, and self-efficacy of behavioral control over not touching one's face. By identifying the role of psychosocial elements in people's face-touching behaviors, our research could inform the design of health communication messages that advocate avoiding direct face-touching to reduce infection risk, especially during current (eg, COVID-19) and future pandemics.

METHOD

Sample

A nationwide online survey, approved by the IRB of the University (ID: STUDY00001526), was conducted among adult participants aged 18 years or older (N = 1,060) recruited through Qualtrics Panels. The mean age of the sample is 49 years old (range 18-87). Table 1 provides full demographic information.

Measures

Dependent variables: Face-touching mitigation behaviors

Participants were asked to choose what they would do if they felt a sudden itch on their face in a private (e.g., home) and public (e.g.,

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Table 1
Demographics of the sample and descriptive statistics of variables

Demographic	Category	Frequency	%
Gender	Male	524	49.5
	Female	526	49.7
	Other	8	0.8
Race	White of Caucasian	691	65.2
	Hispanic, Latino/a/x, or Spanish origin	137	12.9
	African American or Black	126	11.9
	Asian, Asian Indian, or Asian American	63	5.9
	American Indian or Alaska Native	21	2.0
	Middle Eastern or North African	3	0.3
	Native Hawaiian or Pacific Islander	1	0.1
	Other	18	1.7
Education	Less than high school degree	21	2.0
	High school degree or equivalent	265	25.0
	Some college but no degree	243	22.9
	Associate degree	143	13.5
	Bachelor's degree	243	22.9
	Master's degree	106	10.0
	Doctorate degree	24	2.3
	Other	3	0.3
Income	$0	46	4.3
	$1 - $24,999	249	23.5
	$25,000 - $49,999	333	31.4
	$50,000 - $74,999	200	18.9
	$75,000 - $99,999	97	9.2
	$100,000 - $149,999	74	7.0
	$150,000 and above	49	4.6
Health condition	Poor	38	3.6
	Fair	176	16.6
	Average	228	21.5
	Good	459	43.4
	Excellent	148	14.0
COVID vaccination	Yes – fully vaccinated	658	62.1
	Yes – partially vaccinated	74	7.0
	No	303	28.6
Flu shot every year	Yes	585	55.2
	No	446	42.1
Descriptive statistics of dependent variables	**Category**	**Frequency**	**%**
Mitigation behaviors in private	Suboptimal behaviors	606	57.2
	Optimal behaviors	443	41.8
Mitigation behaviors in public	Suboptimal behaviors	455	42.9
	Optimal behaviors	594	56.0
Descriptive statistics of independent variables	**Mean**	**SD**	**Range**
Biting nails	2.03	1.26	[1.00, 5.00]
Licking fingers while eating	2.46	1.13	[1.00, 5.00]
Picking nose	2.52	1.07	[1.00, 5.00]
Rubbing eyes	3.10	0.94	[1.00, 5.00]
General hygiene practice	23.54	13.32	[1.00, 42.00]
Knowledge	8.64	2.14	[1.00, 11.00]
COVID-19 impact (α = .96)	5.01	1.57	[1.00, 7.00]
Perceived susceptibility in private	3.87	1.83	[1.00, 7.00]
Perceived susceptibility in public	4.79	1.79	[1.00, 7.00]
Perceived severity in private	3.59	1.80	[1.00, 7.00]
Perceived severity in public	4.81	1.70	[1.00, 7.00]
Benefits (α = .96)	5.25	1.25	[1.00, 7.00]
Barriers (α = .87)	3.46	1.79	[1.00, 7.00]
Self-efficacy (α = .89)	4.36	1.54	[1.00, 7.00]

grocery store) environment. There were 5 options: (1) scratch face with fingers directly, (2) scratch face with the back of your hands directly, (3) sanitize your hands first and scratch face, (4) use a cloth and/or napkin and/or shirt to scratch your face, and (5) wait until the itch goes away. We dichotomized responses into suboptimal (1 or 2) and optimal (3-5) behaviors. Table 1 includes descriptive statistics for all study variables.

Self-reported face-touching habits

We asked participants to self-evaluate four habitual face-touching behaviors in the present study: biting fingernails, licking fingers while eating, picking nose, and rubbing eyes. Participants self-reported their behavioral frequency on a scale from 1 (*never)* to 5 (*always*).

General hygiene, knowledge, and COVID-19 impact

General hygiene practice was calculated as the product of the number of hand parts washed every time and the typical time length of washing hands. Knowledge about risks of hand-head contact was calculated as the sum of the score of 11 true or false statements. The correct answer was coded as 1 and the wrong answer was coded as 0. The impact of COVID-19 on awareness of touching face, eyes, nose,

Table 2
Variables statistics of regression models

	Mitigation behaviors in private								Mitigation behaviors in public							
	Model 1*: Nagelkerke R^2 = .16, Classification = 65.7%				Model 2†: Nagelkerke R^2 = .29, Classification = 72.4%				Model 1*: Nagelkerke R^2 = .15, Classification = 64.1%				Model 2†: Nagelkerke R^2 = .22, Classification = 68.5%			
Variables	B	*P*	OR	95% C.I. for OR	B	*P*	OR	95% C.I. for OR	B	*P*	OR	95% C.I. for OR	B	*P*	OR	95% C.I. for OR
Gender‡	.29	.044	1.33	[1.01, 1.76]	.29	.056	1.34	[0.99, 1.81]	.17	.226	1.19	[0.90, 1.56]	.16	.279	1.17	[0.88, 1.56]
Race§,¶	-.30	.044	0.74	[0.56, 0.99]	-.15	.338	0.86	[0.63, 1.17]	-.37	.014	.69	[0.52, 0.93]	-.24	.121	.79	[0.58, 1.07]
Education	-.07	.160	0.93	[0.84, 1.03]	-.06	.308	0.94	[0.85, 1.05]	.02	.659	1.02	[0.93, 1.13]	.04	.499	1.04	[0.93, 1.15]
Income	.13	.018	1.13	[1.02, 1.26]	.09	.108	1.10	[0.98, 1.23]	-.07	.168	.93	[0.84, 1.03]	-.09	.107	.92	[0.82, 1.02]
General hygiene	.01	.030	1.01	[1.00, 1.02]	.01	.331	1.01	[0.99, 1.02]	.01	.006	1.01	[1.00, 1.03]	.01	.132	1.01	[1.00, 1.02]
Biting fingernails	.32	< .001	1.38	[1.22, 1.57]	.23	.001	1.25	[1.10, 1.43]	.17	.008	1.18	[1.05, 1.34]	.13	.042	1.14	[1.01, 1.30]
Licking fingers	.03	.675	1.03	[0.89, 1.19]	-.03	.662	0.97	[0.83, 1.13]	-.09	.207	.91	[0.79, 1.05]	-.14	.060	.87	[0.75, 1.01]
Picking nose	.04	.642	1.04	[0.89, 1.21]	.03	.748	1.03	[0.87, 1.21]	.01	.928	1.01	[0.87, 1.17]	.04	.622	1.04	[0.89, 1.22]
Rubbing eyes	-.44	< .001	0.65	[0.55, 0.76]	-.39	< .001	0.68	[0.57, 0.81]	-.21	.012	.81	[0.69, 0.96]	-.15	.083	.86	[0.73, 1.02]
Knowledge	-.17	< .001	0.84	[0.79, 0.90]	-.14	.001	0.87	[0.80, 0.94]	-.09	.009	.91	[0.85, 0.98]	-.06	.171	.95	[0.88, 1.02]
COVID-19 impact	.25	< .001	1.28	[1.16, 1.42]	.05	.462	1.05	[0.93, 1.18]	.39	<.001	1.48	[1.34, 1.64]	.28	<.001	1.33	[1.18, 1.49]
Susceptibility					.05	.310	1.05	[0.95, 1.16]					.03	.574	1.03	[0.93, 1.14]
Severity					.32	< .001	1.37	[1.24, 1.52]					.19	.001	1.21	[1.08, 1.35]
Benefits					-.11	.149	0.89	[0.76, 1.04]					-.28	<.001	.75	[0.64, 0.88]
Barriers					-.23	< .001	0.80	[0.72, 0.88]					-.20	<.001	.82	[0.74, 0.90]
Self-efficacy					.14	.010	1.15	[1.03, 1.28]					.13	.011	1.14	[1.03, 1.26]

*Block 1 included demographic variables, general hygiene practice, face-touching habits, and knowledge.
†Block 2 included psychosocial variables, ie, perceived susceptibility in private or public, perceived severity in private or public, benefits, barriers, and self-efficacy, in addition to variables from Block 1.
‡For gender, male = 0 and female = 1.
§For race, 0 = white and 1 = non-white.
¶Age was not included in the model because of missing data on a large number of participants. We ran the analysis with and without age in the model and found that age was not a significant predictor in either final model and its inclusion did not change the significance of any results.

or mouth (4 items) was measured on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

Psychosocial correlates

Health beliefs, including perceived susceptibility and severity of face-touching (in private and in public), as well as perceived benefits (4 items), barriers (2 items), and self-efficacy (3 items) of not touching face were measured on a scale from 1 (*lowest*) to 7 (*highest*).

Data analysis

We used hierarchical logistic regression analysis to examine associations of study variables with the behavioral outcomes of interest. Demographics, general hygiene, knowledge, COVID-19 impact, and self-reported face-touching were entered in Model 1. We entered the HBM variables in Model 2. All analyses were conducted with SPSS.

RESULTS

Overall, people reported engaging in optimal face-touching mitigation behaviors in public more often than they did in private (Table 1). Table 2 provides full results for the models related to performing face-touching mitigation behaviors in public and private

Mitigation behaviors in private

Model 1 explained 16% of the variance in mitigation behaviors in private. Model 2 (the HBM variables) increased the variance explained by 13%. In Model 2, self-reported behaviors of biting fingernails (positive) and rubbing eyes (negative), as well as knowledge of the implications of face-touching (negative), associated with engaging in optimal mitigation behaviors. The significant psychosocial correlates were perceived severity (positive), barriers (negative), and self-efficacy (positive).

Mitigation behaviors in public

Model 1 explained 15% of the variance in mitigation behaviors in public. Model 2 explained an additional 7% of the variance. In Model 2, self-reported behavior of biting fingernails (positive), COVID-19 impact perceptions (positive), perceived severity (positive), benefits (negative), barriers (negative), and self-efficacy (positive) were associated with optimal behaviors.

DISCUSSION

In the current study, participants self-reported they were more likely to directly touch their face in private more than in public. This result is not surprising given people are likely to perceive themselves as being more cautious of their own behaviors in public since their behaviors are more observable and public spaces seem to be less clean. Our analyses found three psychosocial correlates could be a target of future health communication interventions and campaigns: perceived severity of face-touching, barriers to avoid touching one's face, and self-efficacy about avoiding face-touching. The results confirmed the potential effectiveness of emphasizing perceived severity in health promotion[5] and provided novel practical insights. Based on these findings, health communication messages could be more comprehensive by highlighting the risk of direct face-touching to getting sick such as showing numbers of increased infection rates, promoting detailed and easy-to-follow hand-hygiene practices such as carrying hand sanitizer, and presenting encouragement to strengthen one's confidence in overcoming barriers and controlling the threat. The results also suggest promising effects of pandemic-related health communication—the COVID-19 pandemic has a positive impact on optimal behavior in public. Presenting COVID-19 as a specific and urgent health risk in health messages could help cultivate the habit of avoiding direct face-touching (especially the eyes, nose, and mouth area) for general infection control. Limitations of this study include self-reported biases and robustness of operationalization of some variables related to hand hygiene and face-touching.

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