Original Article

Enhancing Hand Cleaning During Dental Visit Through Nudging

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Abstract

Background: Hand washing or hand-cleaning is a behaviour that has not been performed routinely as a habit for everyone, but its importance has been greatly emphasised during the COVID-19 outbreak. Nudges in the form of prompts, cues and reminders have been used to encourage hand cleaning. ***Objective:*** To improve hand-cleaning to prevent transmission of the disease during dental visits through nudge. ***Methods:*** This experimental, observational pilot study was conducted at private dental practices. Hand sanitisers were placed at a few places in the clinic to encourage hand cleaning. Hand sanitiser was not placed outside the treatment room during the baseline data collection. The patients' behaviour in using the hand sanitisers was observed and analysed. ***Results:*** A total of 130 participants were involved in the study, with more than half being female (59.2%) and above 35 years old (60.8%). More than half of the participants performed hand cleaning behaviour immediately after treatment (68.2%). However, there was no significant difference between those who performed the hand cleaning when the hand sanitiser was placed in the waiting room and front of the treatment room (P>0.05). Placing the hand sanitiser in front of the dental treatment room increased the likelihood of hand cleaning. However, there was no significant difference (OR: 3.4, 95%CI: 1.09-10.7, p<0.05). ***Conclusion:*** This study has shown the potential effect of using a nudge to encourage hand cleaning after dental treatment by placing an additional hand sanitiser in front of the dental treatment room. Despite the increase in the number of people using the hand sanitiser immediately after treatment, there is limited evidence on the long-term effect of this measure, and therefore, long-term research is warranted.

Keywords: Hand cleaning, dental practices, nudge, COVID-19

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Introduction

COVID-19 virus has hit the world tremendously. The virus, transmitted mainly through respiratory droplets,[1] and the infection can occur from the asymptomatic person,[2] pose a significant risk to those who neglect the preventive health measures. Preventive health behaviour has been one of the main ways to contain the spread of the virus. Governments worldwide have taken many measures to prevent disease transmission, such as emphasising self-protection, minimising social activities and advising quarantine for those with symptoms. To improve self-protection, behaviour has been the primary target. Thus, governments and policymakers have focused on the way people behave. One approach that has been used to tackle a person's behaviour is behavioural insight.[3] Behavioural insight has been used in many sectors to improve policies, including health and healthcare outcomes.[4]

Nudge which Thaler and Sustein introduced in 2008 has been considered an expression of behavioural insight.[5] A systematic scoping review has shown that nudge can change people's

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behaviour effectively and improve outcomes of particular conditions.[6] Nudge-type interventions may have been used in a certain way with the potential to change the decision-making and behaviour of people throughout the COVID-19 outbreak, in particular, health precaution and self-protection.

Studies have shown that dentistry is one of the crucial areas as it may pose an individual with a significant risk of infection due to the nature of the treatment. During the early stage of the pandemic, the dentist was instructed by the health authority or regulatory authorities to stop providing treatment except to those who required emergency treatment. This is because dental treatments produce splatters and aerosols, which can remain airborne for many hours and contaminate inanimate surfaces when they fall.[7] Furthermore, the droplets can be transmitted over a long distance, thus capable of contaminating surfaces beyond the dental chair. Thus, post significant risk if proper preventive measures are not taken.

In order to prevent or decrease contact transmission, reinforcement on hand hygiene is one of the utmost necessary preventive measures. Studies have shown that handwashing or hand-cleaning is a self-hygiene method that removes bacteria and viruses from hand and reduces person-to-person transmission.[8] The same goes for alcohol-based hand sanitiser. Generally, handwashing or hand-cleaning compliance is very low regardless of the presence of diseases.[9] The U.S Centers for Disease Control and Prevention (CDC) recommended handwashing and hand sanitisers at home, school, workplace and other risk areas.[10] Handwashing is essential to preventing oneself from getting sick and spreading the germs around them.

Initiative has been made by placing hand sanitisers at apparent locations such as in front of the elevators, counters and door entrances. More reminders have been put up to encourage hand cleaning, but the evidence of its effectiveness is limited. Therefore, this study explores how nudge was implemented in dental practices to improve hand-cleaning to prevent disease transmission during dental visits.

Methods

This was an experimental, observational pilot study. Patients attending two private dental practices were invited to participate in the study. Informed consents were obtained from all the participants who agreed to participate in the study. Hand sanitisers were placed at a few places in the clinic to encourage hand cleaning; at the counter, waiting area and outside the treatment room (Figure 1&2). However, the hand sanitiser was not placed outside the treatment room for baseline data. A research assistant observed the patients' behaviour in using the hand sanitisers.

Descriptive data analysis was conducted for the socio-demographic information. Logistic regression was conducted to determine factors associated with the hand cleaning behaviour immediately after treatment.

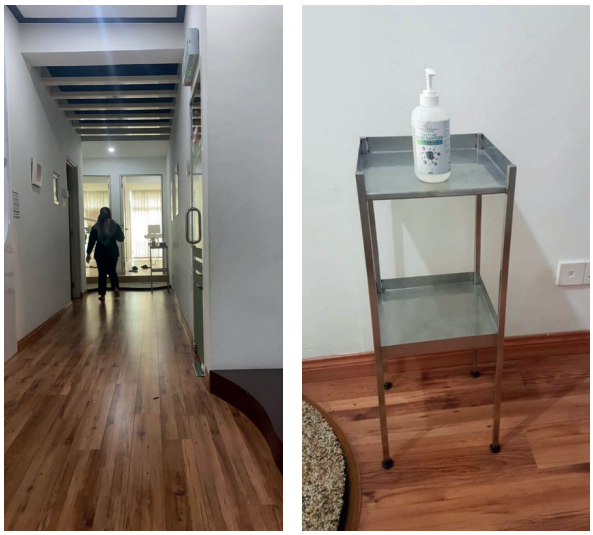

Figure 1 & 2: Hand sanitizer was placed in front of treatment room.

Results

A total of 130 participants involved in the study. More than half of the participants were female (59.2%) and above 35 years old (60.8%). Most of the participants visited the dental practices had a degree or higher qualifications. Two third claimed they did not have any chronic illness and almost half (43%) were working in the private sectors (Table 1). Table 2 presents the percentage of participants who performed the hand cleaning behaviour after the dental treatment. More than half of the participants performed hand cleaning immediately after treatment (68.2%) when the hand sanitiser was provided in front of the dental treatment room. However, there was no significant difference between those who performed the hand cleaning when the hand sanitiser was placed in front of the treatment room and waiting room ($P>0.05$). Table 3 presents the factor associated

with immediate hand cleaning after treatment. Placing the hand sanitiser in front of the dental treatment room increased the likelihood of hand cleaning; however, it was not significantly different if there were no hand sanitiser. The participants were more likely to perform hand cleaning immediately after treatment when the hand sanitiser was placed outside the dental treatment room than when there was no hand sanitiser (OR: 3.4, 95%CI: 1.09-10.7, $p<0.05$). It is also shown that those having a certificate and diploma were more likely to perform the hand cleaning compared to other levels of education. Those with certificate and diploma qualifications were 4.7 times as likely to perform hand cleaning immediately after treatment compared to those with other qualifications.

Table 1: Demographic Profile of the Participants

Variable	Category	Frequency	Percentage
Age	18 - 25 years old	29	22.3
	26 - 35 years old	22	16.9
	36 - 45 years old	27	20.8
	46 - 55 years old	32	24.6
	> 55 years old	20	15.4
Total		130	100.0
Gender	Male	53	40.8
	Female	77	59.2
	Total	130	100.0
Education	Up to Secondary School	33	25.4
	Certificate / Diploma	23	17.7
	Bachelor's degree & higher	74	56.9
Total		130	100.0
Having a chronic illness	Yes	16	12.3
	No	114	87.7
Total		130	100.0
Work Sectors	Government	27	20.8
	Private	57	43.8
	Education Centre	6	4.6
	Unemployed	40	30.8
Total		130	100.0

Discussion

Hand washing or hand-cleaning is a behaviour that has not been performed routinely as a habit for everyone.[11] Habits are "automatic behaviour" or specific behavioural actions that occur with environmental cues or without a conscious decision of a particular condition.[12] Not everyone washes their hand before eating, holding food or even before touching their nose, mouth or rubbing their eyes. Besides, many people find it is hard to wash their hands effectively. Therefore, it has imposed a significant challenge during the COVID-19 outbreak. During the COVID-19 outbreak, nudges in the form of prompts, cues, and reminders have been used in Malaysia.

An analysis of 22 studies reported that the COVID-19 virus could persist on inanimate surfaces (i.e. glass, metal and plastic) for up to nine days.[13] Thus, hand cleaning and surface disinfection is crucial to prevent further spreading of this virus during a dental visit. Consequently, an additional hand sanitiser was placed in the dental clinic at a location that seems to be highly visible to encourage hand cleaning.

Studies also showed that interventions increase handwashing, often overwhelming, but most of it is not sustainable.[14,15] A one-year follow-up experimental study showed that handwashing could be sustained or become habitual behaviour when anticipating monitoring and incentive interventions.[16] However, the group that received incentive intervention showed lower handwashing persistency compared to the monitor intervention group after removing the interventions. Besides, social norms have also been used to improve handwashing behaviour by engaging other people around them, such as family members, administrators or colleagues.[17] Despite that, self-hygiene concerning persistence in handwashing might be expected to be consistent when under high-responsibility conditions, such as at a hospital or other high-risk areas.[18] The goal is to help people perform their hand cleaning, thus making hand cleaning possible, easy and convenient to improve hand hygiene. More reminders have been put up to encourage handwashing or hand cleaning, but the evidence of its effectiveness is still limited. This study found that placing hand sanitisers at highly visible locations is essential, as the location is another crucial factor in increasing the nudging effect. More patients tended to clean their hands

Table 2: Percentage of participants of those who performed the hand cleaning behaviour after treatment (N=130)

	After Treatment			At the counter After Treatment		
	Yes n (%)	No n (%)	P value	Yes n (%)	No n (%)	P value
Baseline	7 (31.8)	58 (53.7)	0.100	23 (57.5)	42 (46.7)	0.342
Nudge	15 (68.2)	50 (46.3)		17 (42.5)	48 (53.3)	

Table 3: Factor associated with hand cleaning immediately after treatment: finding from logistic regression

Variables	OR	95% CI	P value
Nudge	3.418	1.090, 10.72	*0.035
Baseline			
Gender			0.200
Male	2.037	0.687, 6.040	
Female			
Age			0.858
18-25 yrs old	1.967	0.273, 14.17	
26-35 yrs old	0.891	0.113, 7.051	
36-45 yrs old	0.990	0.142, 6.893	
46-55yrs old	0.589	0.268, 10.15	
>55 yrs old			
Education level			*0.020
Up to Secondary School	0.671	0.154, 2.911	
Certificate / Diploma	*4.764	1.391, 16.32	
Bachelor's degree & higher			
Work Sector			0.454
Government	1.953	0.332, 11.49	
Private	2.864	0.609, 13.48	
Education Center	4.429	0.488, 40.21	
Unemployed			
Chronic disease			
No	1.909	0.188, 19.41	0.585
Yes			
Healthcare worker			
No	1.306	3.418, 1.090	0.152
Yes			

when the hand sanitiser was placed in front of the treatment room. The implementation of a nudge was encouraging and able to steer people to the desired behaviour.

Conclusion

Nudge-type interventions have been implemented during the COVID-19 outbreak at national and local communities' levels, and at the individual organisations and workplaces. This study has shown the potential effect of using a nudge to encourage hand cleaning after dental treatment by placing an additional hand sanitiser in front of the dental treatment room. Despite the increase in the number of people using the hand sanitiser immediately after treatment, there is limited evidence on the long-term effect of these measures. Therefore, long-term research to explore the effectiveness of the nudge to improve self-protection is necessary.

Conflict of interest: None declared.

Ethical Clearance: The study was approved by the Ethical Review Committee of Universiti Sains Islam Malaysia, Kuala Lumpur, Malaysia (JKEP/2020-107).

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Authors' contribution: Both the authors were equally involved in concept and design of the study, data collection, analysis, manuscript preparation, revision and finalization.

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