Application of Motivation, Opportunity and Ability (MOA) model to COVID-19 preventive behaviours: A web-based survey

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Abstract

Background: New variants of COVID-19 are emerging as part of the evolutionary cycle of the viruses. Therefore, a combination of positive behaviours is still endorsed to gain maximum protection from COVID-19. In this context, many behaviour-related models have been adopted to understand the behaviour dynamics of the disease. The MOA model is a well-known model used to understand consumer behaviour.

Objectives: The aim of this study is to determine the motivation, opportunity and ability to perform key positive COVID-19 preventive behaviours among a sample of internet users to help to get an insight into future behavioural interventions in Sri Lanka.

Methods: An online descriptive cross-sectional survey was conducted through the HPB-SL official Viber channel to assess nine selected behaviours' (Handwashing, Cough Etiquette, Avoid touching the face, Wearing face masks, Surface cleaning, Keeping a 1m distance, Avoiding crowds, Avoiding ill, Self-isolation) motivation, opportunity and ability during December 2020 to January 2021. A ten-point unipolar Likert behaviour scale was developed for the three selected attributes (motivation, opportunity and ability). An unrestricted self-selected survey sampling method was followed.

Results: Out of the invitations sent, 475 respondents answered the survey giving response rate of 88.4%. The motivation, opportunity and ability were high for mask-wearing out of the selected nine behaviours. Overall, females had higher motivation for the selected nine behaviours. Even though motivation and ability are higher for washing hands, the opportunities are low for washing hands. Similar motivation, opportunity and ability were seen for cough etiquette. Furthermore, higher education qualifications and increasing age had higher motivation, opportunity, and ability than lower education qualifications and younger age groups.

Conclusions and recommendations: The MOA model provides a good insight into the practicality of COVID-19 preventive behaviours in the field. The findings of this study can be used to implement successful behaviour change programmes at the field level in the future.

Keywords

COVID-19, Primary prevention, Motivation, Web-based surveys

Introduction

The COVID-19 pandemic caused devastating global health, economic and social consequences. Effective COVID-19 prevention warrants sustained behaviour change and vaccination. Millions of the population are currently vaccinated globally, and the demand for the vaccine is hardly met, aggravating inequity. Moreover, understanding the long-term effectiveness and effect of the vaccine on the transmission of the disease is yet to be explored. Furthermore, the emergence of new disease strains is still occurring at a regular pace. Therefore, the importance of COVID-appropriate behaviours during the post-vaccination period to control COVID-19 has still not diminished [1].

A combination of positive behaviours is endorsed to gain maximum protection from COVID-19. Many behaviour-related models have been adapted to understand the behaviour dynamics of the disease. For example, the Swiss Cheese model originally applied to prevent workplace accidents is advocated for COVID prevention by many [2]. It describes providing multiple layers of preventive mechanisms to avoid the harm done by small breaching of preventive measures.

The Swiss Cheese model and other relevant models can be used to predict how people decide on adopting specific behaviours.

The motivation (M), opportunity and ability (A) - (MOA) model proposes that individual behaviour is determined by motivation, opportunity and ability to implement the behaviour [3]. According to this model, motivation is the habitual /emotional response or analytical decision to execute a particular behaviour. It is moderated by two factors: ability, knowledge or the skills needed for the behaviour and opportunity representing all external controls like time and resources [4,5]. Therefore, it is proposed that a particular behaviour is a product of the multiplication of motivation, opportunity and ability. A reduction in any element results in

a drastic behaviour reduction [4,6].

Based on the evidence, nine key positive behaviours were identified to promote among the general public in Sri Lanka. Namely, washing hands frequently and properly, covering the mouth with the arm when coughing and sneezing, avoiding touching the face, nose or mouth, keeping a one-meter distance, avoiding crowds and social gatherings, using a face mask when going out, cleaning the surfaces regularly, avoiding close contact with those who are ill and, self-quarantining when sick [7].

The endorsed few key positive behaviours challenged many social norms and natural behaviour of humans. Humans have become social living beings during evolution over the years [8] However, social distancing is considered one of the most effective strategies for COVID prevention. Similarly, the face is regarded as a component of the self-image [9] Nevertheless, people are being asked to ask to cover it with a face mask. Evidence suggests a person typically touches their face 15-20 times habitually in an hour [10,11]. However, during the COVID-19 epidemic, people were asked not to touch their faces.

Furthermore, many cultures were promoting helping and looking after ill persons. However, people were asked to avoid close contact with the sick during the epidemic. Many recommendations regarding behaviour changes required to prevent COVID-19 were sudden, and the WHO requested the general public to upgrade their behaviour rapidly during the last year. However, people became increasingly unresponsive; finally, pandemic fatigue and message fatigue were evident in many parts of the world [12]. Hence, efficient management of message fatigue is critical through addressing peoples' motivation, opportunity and capability to implement positive behaviours in the community [12].

Moreover, the type of behaviour intervention-

law (fiscal measure, regulations), education, communication /social marketing depends on the element deficient for a particular behaviour [5,13]. Hence determining the deficient element for a specific behaviour is essential and timely to implement evidence-based interventions to modify positive behaviours to prevent COVID-19. Therefore, the present study aims to determine the motivation, opportunity and ability to perform key positive behaviours among a sample of internet users to get an insight into future behavioural interventions in Sri Lanka. Determining the motivation for preventive behaviours will help health policymakers plan effective behaviour change campaigns. It will provide much-needed evidence for effective campaigns. Evidence about the level of opportunities will provide insight for grassroot health workers and other village-level community influencers to adjust their strategies at the ground level.

Objective

The objective of this study was to determine the motivation, opportunity and ability to perform key positive COVID-19 preventive behaviours among a sample of internet users to help to get an insight into future behavioural interventions in Sri Lanka.

Materials and method

An online descriptive cross-sectional web survey was launched in December 2020 to January 2021 for a period of 2 months through the HPB-SL official Viber channel, which consisted of 454,534 followers at the time of deployment. Sri Lankans who are 18 years or older were invited to participate. The proportion of individuals with an estimated level of perceived motivation or availability of the opportunity and the ability to adopt any key behaviour in Sri Lanka was taken as 50% since no data was available. A minimum of 537 subjects was-required with a precision level of 5% using a standard formula with a non-response rate adjustment of 40% [14]. An unrestricted self-selected survey sampling method

was followed. The non-response rate of this study was 11.55%.

Development of the questionnaire

Perceived motivation, availability of an opportunity and ability to perform nine key behaviours were asked on a numerical analogue scale. The three-page final questionnaire included the basic characteristics of the participants on the first page. Participants were able to review the answers and change them by using the back button before submission Previous research studies on motivation, opportunity and ability were considered in developing the scale. We held several stakeholder meetings with national-level programme managers, field health workers, UN agencies, and community-based organizations to obtain input to the scale. The scale's content validity was established with community medicine experts. The scale was designed as a unipolar scale. Answers were developed on a tenpoint Likert scale; ability from very easy (0) to very hard (10), motivation from no motivation at all (0) to extremely motivated (10) and availability of opportunity not at all (0) to most of the time (10). The questionnaire was translated into two languages (Sinhala and Tamil). The questionnaire was pretested using standard cognitive probes among colleagues. The technical functioning was tested among five potential participants, and necessary corrections were made to make the form easy to fill in less than three minutes.

Data collection and analysis

Participants were recruited through invitations via Viber messages. Data was collected through a Google form embedded in a Viber message; responses were automatically collected to an excel sheet stored in the Google Drive of the official HPB account, to which only the Principal Investigator had access. Responses were collected, coded, validated, and analysed using SPSS software. Results were expressed as means (standard deviations), and ANOVA was used to determine

any statistically significant difference.

Results

Basic socio-demographic characteristics of the survey participants

The response rate of the sample was 88.4%, and 475 responded. The mean age of the sample was 40.42 years (SD ± 12.16). Most participants were males (58%) and were educated to G.C.E A/L or above (96%). The main socio-demographic characteristics of the sample are given in Table 1.

Motivation, opportunity and ability for each positive key behaviour to prevent COVID-19 infection

The highest motivation, opportunity and ability were demonstrated for wearing a mask. Even though motivation and ability are higher for washing hands, the opportunities are low for washing hands. Similar motivation, opportunity and ability were seen for cough etiquette. The ability to avoid touching the face is low, even though the motivation and opportunity are high. The motivation is high for avoiding crowds and self-isolation. However, opportunities and abilities are lacking. Similarly, motivation is high to keep at least a one-meter distance and clean surfaces, but ability and opportunity are low. Avoiding illness had a wide variation in opportunity despite high motivation (Figure 1).

Socio-demographic factors and motivation, opportunity and ability for each positive key behaviour to prevent COVID-19 infection

There was a statistically significant difference in motivation in handwashing and wearing facemasks with gender. Similarly, in the opportunity to avoid touching the face, wearing a facemask and surface cleaning, females scored more than males (Table 2). The ability to handwash, cough etiquette, and wear a mask significantly differed according to age. The ability to handwash, cough etiquette, wearing masks increased as the age increased except for the > 60-year age group. Those with higher educational qualifications had statistically significantly better motivation for

handwashing, avoiding touching the face and wearing masks. Occupation, civil status and race did not have much variation in motivation, opportunity and ability except for mask-wearing (Table 2).

Our study found that physical and social distancing overall had lower mean values for motivation, opportunities, and abilities personal hygiene-related behaviours. than Furthermore, regarding physical and social distancing measures, females had higher motivation for keeping a one-meter distance. The ability to avoid ill and self-isolation significantly differed with age (Table 3). Those with higher educational qualifications have better motivation to keep one-meter distance, avoid crowds, and avoid ill persons and self-isolation. Civil status and occupation did not vary much in motivation, opportunity and ability. However, the Sinhala ethnicity had better opportunities and the ability for self-isolation (Table 3).

Discussion

Our study found that motivation, opportunity, and ability are high for mask-wearing, which can be easily implemented. All other behaviours had a reasonable level of motivation; however, the opportunities and abilities were comparatively low. Overall, females had higher motivation. In addition, higher educational qualifications and increasing age had higher motivation, opportunity, and ability compared to lower educational qualifications and younger age groups.

Findings similar to our study have been reported by a survey conducted to assess the barriers and facilitators of adherence to social distancing, which reports that men are less adherent than women. One of the key explanations for this difference was the lower risk-taking by females 8. The explanation given by the authors tally with our study findings as well. A similar finding is also reflected in another study by Clark et al. 15 in a much larger international sample that reports that the female gender is more likely to engage in COVID-19-related

voluntary compliance behaviours than males. Although our study found that increase in age had an association with some of the behaviours (handwashing, cough etiquette, wearing masks), the study by Clark et al. 15 reports age is generally unrelated to behaviours (wearing masks, social distancing, hand washing and staying at home). These differences in the two studies may be due to the better distribution of age categories in their sample than our research, which consisted of a younger population.

In the present study, physical and social distancing had lower mean values for motivation, opportunities and abilities compared to personal hygiene-related behaviours. This distinction is reflected in other research as well. A study by Wisman et al. 16 reveals that compliance related to hand washing and cough behaviours is uniformly distinct from compliance related to social distancing behaviours. Barret and Cheung 17 suggest that knowledge and socio-cognitive perceptions may result in this difference. The authors further suggest that the overall emphasis paid at the time of the epidemic for the particular behaviour is important, and they have found a lower rate of hand hygiene behaviour compared to social distancing in their study. At the time of the present study in Sri Lanka, the emphasis was mainly on personal hygiene behaviours, and there was comparatively a low interest in social distancing measures.

The findings of this study have many potential implications for COVID-19 prevention behaviours in Sri Lanka. Firstly, it will provide

the much-needed evidence for behaviour change interventions for specific behaviours required for COVID-19 prevention. The evidence can be used to target customised behaviour change programmes based on socio-demographic characteristics. Secondly, it provides the particular behaviour change interventions to focus on (improve motivation, increase the opportunity or increase ability). These can be provided by ways of means of law (fiscal measure, regulations), education (giving knowledge and skills) or improving communication (social marketing) depending on the deficient element of a particular behaviour 5,13. Finally, the MOA model provides the muchneeded monitoring framework for behaviour change interventions.

The main limitation of this study is the representativeness of the study population. Since this was an online survey done through Viber, selection bias is unavoidable. Therefore, it might affect the generalizability of the study findings.

Conclusion

The motivation, opportunity and ability are high for mask-wearing out of the selected nine behaviours. Overall, females had higher motivation; higher educational qualifications and increasing age had higher motivation, opportunity, and ability than lower educational qualifications and younger age groups. The MOA model provides a good insight into the practicality of COVID-19 preventive behaviours. The findings of this study can be used to implement successful

behaviour change programmes at the field level.

Author Declaration

Author contribution: MSDW, MGSNSP, VCNV, and SASCK were responsible for conceptualization, conducting the study, and writing the manuscript. BMIG, WMPCW, VCNV, and SASCK reviewed the draft manuscript. All authors reviewed and approved the final manuscript.

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Table 1: Socio-demographic characteristics of the survey participants (n=475)

	Characteristic	n	%
Sex*	Male	275	58.0
	Female	199	42.0
Education*	Up to G .C. E (O/L)	19	4.0
	Above G .C. E (A/L)	455	96.0
Employment**	Employed	376	79.5
	Not employed	97	20.5
Civil status****	Married	349	74.1
	Single	116	24.6
	Divorced/widowed	6	1.3
Race****	Sinhala	395	84.0
	Tamil	61	13.0
	Muslim	10	2.2
	Other	4	0.8
Residence	Colombo	136	28.6
	Gampaha	83	17.5
	Kaluthara	26	5.5
	Other	230	48.4

^{*}missing values (n=1), ** missing values (n=2),

^{***} missing values (n=3), **** missing values (n=4), **** missing values (n=5)

Table 2: Distribution of mean scores of MOA of personal hygiene-related behaviours according to the socio-demographic characteristics

variable	Ē	Handwasning	<u>ම</u>	S	Cougn Euquere	ile Ile	Avoid to	Avoid touching the face	e lace	wea	Wearing race masks	IdSKS	Inc	Surface cleaning	ရွိ
	Σ	0	A	Σ	0	۷	Σ	0	А	Σ	0	А	Σ	0	A
Gender															
Male	8.81*	8.50	8.93	9.03	60.6	9.12	8.36	8.56*	8.48	9.39**	9.55**	9.49**	8.04	7.54**	7.64*
Female	*60.6	8.71	9.04	9.26	9.28	9:36	8.53	8.85*	8.60	**89.6	9.87**	9.82**	8.34	7.96**	7.99*
Age (years)															
<30	8.86	8.71	8.94**	9.20	90.6	**06.8	8.43	8.60	8.34	9.29	9.54	9.27**	8.35	8.13	7.89
31-45	8.79	8.40	8.74**	9.10	9.22	9.14**	8.35	8.69	8.44	9.65	9.76	9.71**	8.15	7.54	7.66
46-60	9.16	8.79	9.39**	9.03	9.27	**09.6	8.69	8.73	8.85	9.45	9.7	**9′.6	8.03	7.87	7.93
>60	9.37	8.93	9.39**	9.43	8.73	9.43**	8.07	8.77	8.64	9.57	9.5	9.54	8.3	7.33	8.04
Education															
Up to 0/L	8.26**	8.42*	8.89	8.89	8.53**	8.68 *	8.00**	9.00	*90'8	**89.8	9.26**	8.84**	8.95	8.79	8.68
Above A/L	**96'8	% 9.8	8.98	9.13	9.20**	9.24*	8.45**	8.67	8.56*	9.55	9.70**	**99'6	8.14	7.68	7.75
Occupation															
Employed	8.92	8.50*	8.92	9.12	9.21	9.29**	8.42	9.21	8.56	9.55*	9.71	9.71**	8.06	7.6	7.67
Not Employed	8.97	8.94*	9.20	9.15	9.00	**96'8	8.45	9.00	8.42	9.35*	9.59	9.33**	8.58	8.19	8.24
Civil status															
Married	8.92	8.54	8.96	9.05**	9.16	9.25	8.38	8.62*	8.54	9.53	69.6	**69.6	8.06*	7.55*	7.68
Other	8.97	8.73	8.97	9.39**	9.19	9.10	8.64	8.91*	8.47	9.47	89.6	9.43**	8.47*	8.18*	8.03
Race															
Sinhala	8.93	8.52*	8.95	9.10	9.16	9.19	8.43	8.68	8.51	9.48*	6.67	9.59**	8.19	7.75	7.79
Other	8.91	8.94*	60.6	9.27	9.23	9.39	8.43	8.74	8.63	9.70 *	9.78	**08'6	8.06	7.59	7.76

 * / ** Statistically significant (p<0.05*, <0.01**)

Table 3: Distribution of mean scores of MOA of physical and social distancing behaviours according to the socio-demographic characteristics

	Keeping	Keeping a 1m distance	tance	Avo	Avoiding crowds	sp		Avoiding ill			Self-isolation	
Variable	Σ	0	∀	Σ	0	۷	Σ	0	۷	Σ	0	A
Gender												
Male	8.83*	7.82	7.90	9.04	8.10	8.22	8.94	8.48	8.73	9.31	8.83*	8.98
Female	*40.6	7.68	7.76	8.76	7.84	8.04	8.68	8.07	8.25	9.49	9.12*	8.97
Age (years)												
<30	8.85	7.97	7.99	8.84	8.11	8.1	8.73	8.17	8.07*	9.18	8.79	8.83*
31-45	8.97	7.65	7.74	8.86	7.77	8.04	8.71	8.27	8.52*	9.46	8.92	*08.8
46-60	8.79	7.71	7.88	8.96	8.22	8.25	8.93	8.38	8.71*	9.43	9.34	9.43*
>60	9.43	8.23	8.04	9.57	8.5	8.71	9.7	8.73	9.32*	9.27	8.2	9.14*
Education												
Up to 0/L	8.42**	8.84	8.68	7.95**	8.74	8.21*	8.21*	8.89	8.89	8.21*	8.89	8.89
Above A/L	8.95**	7.71	7.80	8.97**	7.96	8.14*	8.85*	8.28	8.51	*98.8	8.28	8.51
Occupation												
Employed	8.9	7.68	7.78	8.91	7.88	8.09	8.75*	8.24	8.47	9.42	9.01*	8.93
Not employed	9.04	8.08	8.07	8.99	8.42	8.33	9.15*	8.57	8.75	9.25	8.71*	9.16
Civil status												
Married	8.97	7.74	7.82	8.92	7.92	7.82	8.78	8.23	8.55*	9.39	8.98	8.99
Other	8.85	7.74	7.85	8.97	8.14	7.85	8.96	8.43	8.34*	9.4	8.8	8.89
Race												
Sinhala	8.97	7.68	7.73	8.87	7.91	8.05	8.79	8.27	8.53	9.42	9.01**	*00.6
Other	8.73	8.18	8.38	9.19	8.41	8.62	9.03	8.47	8.51	9.22	8.66**	*98.8
A Motion O acitority A Milita	Opportunity	NP:I	+,									

M - Motivation O - Opportunity A - Ability

 * / ** Statistically significant (p<0.05*, <0.01**)

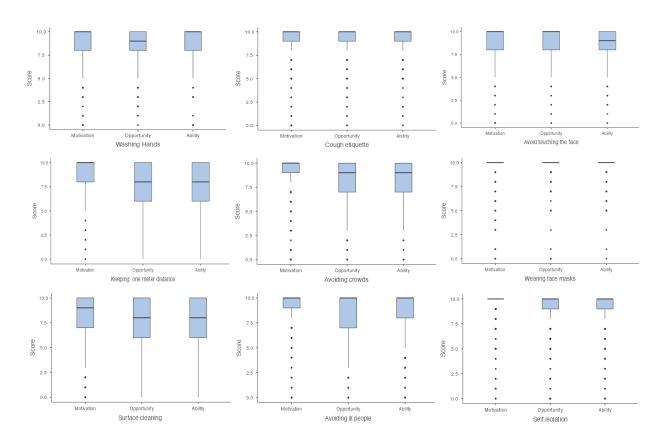


Figure 1: Motivation, opportunity and ability for each positive key behaviours to prevent COVID-19 infection