Research Article

Behavioural Determinants for Hand Hygiene Practices among Primary School Children during COVID-19 Pandemic

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Abstract

Background: Children acquire SARS CoV-2 infection from their family members but they experience mild symptoms. Hand washing promotion programs are being executed in many countries to enhance child healthcare development.

Objective: This study was designed to identify behavioural determinants to increase hand washing practices among primary school children during COVID-19 pandemic.

Methods: This was a cross-sectional study conducted by the Department of Pediatrics, King Edward Medical University/ Mayo Hospital, Lahore from June to November 2020. Total of 195 mothers of primary school children were enrolled by non-probability consecutive sampling. A 23-item, 5 points likert scale questionnaire assessed 5 domains related to hand-hygiene. Data was entered in SPSS 24. Domains were presented as frequency tables. Independent sample t-test was applied to mean score of sub-category of each domain, and to cumulative mean score of each domain. A cut off mean score[8] of ≥3 was taken as satisfactory.

Results: We found satisfactory mean scores amongst mothers for knowledge regarding the importance of hand-washing (3.59±0.62), and commitment regarding maintenance of hand-hygiene (3.44±0.773). Better mean score for liking hand washing with alcohol rub/sanitizer than with soap and water (3.14±1.063 versus 1.10±1.229) was seen. Children reported not feeling dirty if they did not practice hand-hygiene (2.99±1.195). Elders in the households promoted hand-washing, but lacked practicing it themselves (3.48±0.881 versus 2.85±1.242). There was below satisfactory mean score for hand-hygiene amongst children after sneezing, coughing, blowing their nose, or playing (2.50±1.253, 2.23±1.265, 2.27±1.301, 2.83±1.280 respectively). Norm and self-efficacy factors had adequate overall scores (3.17±0.84, 3.17±0.65). The total score for this study was 2.8759±0.419.

Conclusion: We found satisfactory mean scores for risk, attitudes, norms, ability, and self-regulation factors of hand-hygiene among primary school children.

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Key Words: Hand hygiene, COVID-19, Primary school children, Behavioural determinants, RANAS

Introduction:

Children acquire SARS CoV-2 infection from their family members but have been observed to experience symptoms of lesser severity in comparison to adults, good prognosis, and recovery within 1 to 2 weeks after symptom onset[1,2,3]. The current rapid worldwide spread of COVID-19 infection validates the wholesome and universal efforts targeted towards identifying effective preventive strategies and appropriate medical management[1,4].

Practicing hand hygiene by alcohol-based hand rub (ABHR) or hand washing with soap and water, is a simple yet effective and inexpensive way to prevent the spread of various infections. CDC recommendations

reflect this important role. Hand washing mechanically removes pathogens, and laboratory data demonstrate that ABHR formulations in the range of alcohol concentrations recommended by CDC, inactivate SARS-CoV-2[5,6]. CDC recommends using ABHR with greater than 60% ethanol or 70% isopropranolol. Alcohol rubs/ sanitizers are usually seen to be less irritating to hands and are an effective alternative in the absence of a soap and water[7]. It is recommended that hands be washed with soap and water for at least 20 seconds when visibly soiled, before eating, and after using the restroom[5,6].

Hand washing promotion programmes are increasingly being executed in developing countries in order to enhance child health and development, particularly in light of ongoing COVID-19 pandemic[8,9]. Growing evidence suggests that health behaviours such as handwashing are predicted by social-cognitive factors as attitude, subjective norms, and self-efficacy beliefs[8]. So far, very few studies have investigated behavioural determinants underlying children's hand washing practices.

The RANAS (risk, attitudes, norms, ability, and self-regulation) approach provides an analytical tool to analyse the different determinants of behaviour on the basis of quantitative data[8]. In a study conducted in Zimbabwe and Burundi[8], Mosler's RANAS (risk, attitudes, norms, ability, and self-regulation) approach to behaviour change[10] was the basis to measure the behavioural determinants underlying hand washing with soap among primary school children. The study found that the results of the RANAS behavioural determinants predicted children's self-reported hand washing frequencies very well in both countries. The findings of this study strongly suggested that targeted hand washing programmes that educate on hand washing issues along with provision of infrastructure could induce behavioural change for hand washing practices in rural and urban settings[8].

Since there is school closure during pandemic, children are at home and different advisories have already been issued regarding hand washing to prevent COVID-19 spread. Yet, there might be some factors which may be the hindrance to this very simple practice. Therefore, this study has been planned to identify behavioural determinants for interventions (using RANAS model) to increase hand washing practices among primary school children during COVID-19 pandemic.

Methods:

This cross-sectional study was conducted by the Department of Pediatrics, King Edward Medical University/ Mayo Hospital, Lahore from June to November 2020. The study was approved from Institutional Review Board of KEMU. Total 195 mothers of primary school going children were enrolled by non-probability consecutive sampling. Sample size was calculated by using 49% reg-istered cases of COVID-19 in Punjab with 95% confidence interval and power of 70%[11]. A 23-item, 5 points likert scale (0=to no extent/considers of no importance, 1=to a little extent, 2=Neutral, 3=to some extent, 4=to a great extent/considers of great importance) RANAS questionnaire survey assessed 5 domains (risk, attitudes, norms, ability and self-regulation measures) related to hand-hygiene during the COVID-19 pandemic. After taking informed consent, mothers of primary school-going children both employed (doctors, teachers and lawyers) and unemployed (housewives) were requested to fill the online questionnaire. The study participants who did not respond to the questionnaire during defined study duration were excluded from the study. Data were entered in SPSS 24. Domains were presented as frequency tables. Independent sample t-test was applied to mean score of sub-category of each domain, and to cumulative mean score of each domain. A cut off mean score of ≥3 was taken as satisfactory with the understanding that mean±SD of our study equates with the mean±SD in the study conducted by Seimetz E[8].

Results:

Out of 195 mothers, majority (n=89, 45.6%) constituted doctors, followed by housewives (n=66, 33.8%) and teachers (n=38, 19.5%) (Table 1). The principal sources of information regarding COVID-19 were

Table 1: *Mother's occupation (n=195)*

Profession	n (%)
Doctor	89 (45.6)
Housewife	66 (33.8%)
Teacher	38 (19.5)
Lawyer	2 (1)
Total	195 (100)

Table 2: *Results of various behavioural determinants for hand-hygiene among primary school children according to RANAS model (n=195)*

Domains assessed		Mean	Standard Deviation
RISK Health Knowledge	Is it important to wash your child's hands frequently during the COVID-19 pandemic?	3.75	0.618
	Can hand-washing protect your child against COVID-19?	3.44	0.780
		3.59	0.62
ATTITUDE Instrumental beliefs: Time	As a mother, do you think that hand-washing with soap and water takes a lot of time?	1.40	1.245
	Does your child think that hand-washing with soap and water takes a lot of time?	1.02	1.137
----------	Does your child think that hand-washing with alcohol rub/sanitizer take a lot of time?	1.61	1.301
Affective beliefs: Liking	Does your child like washing his/her hand with soap and water?	1.10	1.229
	Does your child like washing his/her hand with alcohol rub/sanitizer?	3.14	1.063
---------- Affective beliefs: Disgust	Does your child feel dirty if he/she doesn't wash his/her hands during the COVID-19 pandemic?	2.99	1.195
		1.87	0.77
NORM Descriptive Norm	Do other family members practice hand-washing during the COVID-19 pandemic?	2.85	1.242
---------- Injunctive Norm	Do the elders in your home promote hand-washing during the COVID-19 pandemic?	3.48	0.881
		3.17	0.84
ABILITY Action self-efficacy	Do you think there are sufficient hand-washing facilities at your home?	3.38	0.930
SELF-REGULATION Action control	Does your child always pay attention to duration of his/her hand-washing during the COVID-19 pandemic?	3.79	0.608
	Does your child wash his/her hands after sneezing during the COVID-19 pandemic?	2.50	1.253
	Does your child wash his/her hands after coughing during the COVID-19 pandemic?	2.23	1.265
	Does your child wash his/her hands after blowing his /her nose during the COVID-19 pandemic?	2.27	1.301
	Does your child wash his/her hands after coming from outside during the COVID-19 pandemic?	2.83	1.280
----------	Does your child wash his/her hands after playing during the COVID-19 pandemic?	3.60	0.846
Remembering	Does your child wash his/her hands after using bathroom during the COVID-19 pandemic?	3.38	0.984
	Does your child was his/her hands before eating during the COVID-19 pandemic?	3.85	0.505
----------	Do you always remember to practice frequent hand-washing of your child at home?	3.53	0.795
	Do you remind your child repeatedly to wash his/her hands during the COVID-19 pandemic?	3.42	0.778
Commitment	Is it necessary for you to maintain hand hygiene of your child during the COVID-19 pandemic?	3.44	0.773
		3.17	0.65
	Total score	**2.8759**	**0.41980**

social media and television combined (n=63, 32.3%), social media alone (n=47, 24.1%), and social media, print media and television combined (n=29, 14.9%) (Table 2). The duration of hand-washing was correctly reported to be 20 seconds by majority of the mothers (n=137, 73%).

Taking cut off mean score of ≥3 score for satisfactory behaviour, we found mothers to be having adequate mean scores for knowledge regarding the importance of hand-washing during the COVID-19 pandemic (3.59±0.62). Although there was less mean score for attitude factors pertaining to instrumental belief for timing of hand-washing techniques, mothers reported about neither themselves nor their children finding this practice to be time-consuming. We found better mean score for liking hand washing with alcohol rub/ sanitizer than with soap and water (3.14±1.063 versus 1.10±1.229). When questioned about feeling of disgust, not all of the mothers reported that their children felt dirty if they did not practice hand-hygiene (2.99±1.195) While elders at the house promote hand-washing (injunctive norm), there was gap in the practicing it by themselves (descriptive norm) (3.48±0.881 versus 2.85 ±1.242). Sufficient hand-washing facilities were available in the households under question (3.38± 0.930). Mothers informed that their children were vigilant to wash their hands after playing, using the bathroom, and before eating (3.60±0.846, 3.38±0.984, 3.85±0.505 respectively), while paying attention to duration of hand-wash (3.79±0.608). However, there was below satisfactory mean score for practicing of hand-hygiene amongst these children after sneezing, coughing, blowing their nose, or coming from outside (2.50±1.253, 2.23±1.265, 2.27±1.301, 2.83±1.280 respectively). Mothers remembered to frequently practice hand-washing of their children at home (3.53±0.795), as well as to constantly remind their children to repeatedly wash their hands (3.42±0.778). We found satisfactory score for commitment amongst mothers regarding maintenance of hand-hygiene of their children during the COVID-19 pandemic (3.44± 0.773). These domains comprising norm and self-efficacy factors however had adequate overall scores (3.17±0.84, 3.17±0.65) (Table 2). The total score for all domains assessed in this RANAS model was 2.8759± 0.419.

Discussion:

The RANAS model enables one to analyse various behavioral factors that could be targeted amongst mothers for improvement of hand-hygiene among their primary school children. Several studies have used this approach for selecting behavior change techniques to improve implementation of effective hand-washing practices among children[8,12]. Hand-washing with alcohol rub/ hand sanitizer or soap and water has been widely advocated as an inexpensive yet important preventive strategy in the battle against COVID-19[13].

In present study, most of the mothers were well aware of the importance of frequent hand-hygiene of their children at home, as well as of the fact that hand-washing is essential in protecting against COVID-19. This knowledge of prevention of diseases by just good hand-hygiene practices has similarly been found in a study conducted in Zimbabwe and Burundi's primary school children, which found high perception of prevention of diarrhea if hand-washing was frequently practiced[8]. The results deduced from our study revealed that hand-washing as recommended by WHO for 20 seconds[12] was adequately practiced by majority of the mothers. This perhaps stems from the overall instrumental belief among mothers and children, that hand-washing, in fact, is not time consuming. Mothers reported that children however, preferred hand-hygiene using alcohol rub/sanitizer rather than by using soap and water. This is in contrast to the behavior found in adults as shown by various studies where higher proportion of individuals under study used more of soap and water than alcohol rub/sanitizer[14]. We found that most of the households had adequate hand-washing facilities at home, and that elders (apart from mothers) were vital to promoting this practice amongst the children, thus injunctive norm and action self-efficacy were well in place. Provision of hand-washing facilities by itself is an important factor for good hand hygiene practices and prevention of various illnesses[13]. A study conducted by WHO/UNICEF Joint Monitoring Program, unfortunately revealed that at the start of COVID-19 pandemic, amongst the least developed countries, 7 out of 10 schools lacked handwashing facilities. One third of these schools belonged to Sub-Saharan Africa and 3 out of 4 children reported deficient handwashing facilities at school[15].

There was a satisfactory response when investigated about practicing hand-hygiene after using bathroom, playing or before eating. However, mothers informed that children somewhat failed to practice this action control after sneezing, coughing, blowing their nose or coming from outside. A study conducted in school children in Nigeria reflected 47.3% respondents practicing hand hygiene while at school[16]. Considering the fact that the route of spread of SARS-CoV-2 is via respiratory droplets and through contact with infected surfaces[17], this was a worrisome notion that arises from this study, and thus a potential target with room for improvement in hand hygiene practices. This aspect could be tackled by encouraging mothers to implement hand washing by soap and water or alcohol rub/sanitizer after the afore-mentioned actions, with particular emphasis on their relation to halting the spread of COVID-19. Social media, print media, television and mobile phone alerts could be used to frequently remind mothers to ensure their childrens' hand-hygiene. There was a lack of adequate hand-washing among the elders in the house as found in this study. Hence, this descriptive norm is perhaps a contributing factor to the lack of hand-washing practice among the younger children, as they may deem it an unimportant act, seeing the elders promote, but not actually practice hand-hygiene. Poor adult examples to follow leading to poor hand hygiene practices has been found in literature as well[18]. There is also a need to inculcate in children the sense of feeling dirty if hand-hygiene is not carried out.

This study has certain limitation that it was carried out in children during a period of school lock-down during the COVID-19, hence the hand washing practices of all these children at school could not be ascertained.

Conclusion:

There was satisfactory score for each domain of the RANAS model, but the overall score for RANAS model was less than satisfactory. This is due to certain unsatisfactory practices in sub-domains of the RANAS model. We found satisfactory responses pertaining to risk (knowledge), attitudes (timing, liking), norms (injunctive), ability (action self-efficacy), self-regulation (action control, remembering, and commitment) factors of hand-hygiene among primary school children. However, there was less than satisfactory response when questioned regarding certain components of norms (descriptive), attitudes (disgust) and self-regulation (action control). These areas need to be targeted by not only asking mothers to be vigilant of when and how the hand washing is carried out by their children, but also to make it attractive by giving small tokens of appreciation, use of hand-washing poems and stories (from print or social media) and actively participating in, while attentively observing their hand-washing practices[19,20]. Lastly, all of these activities could further be extended to include teachers at schools as well where these children study.

In our study we found the need to improve the practice of hand washing among elders at home, and to encourage children to wash their hands after sneezing, coughing, blowing their nose or coming from outside. Children need to be reminded constantly to do so by the caregivers and be educated to be feeling untidy if hand-washing is not done frequently during the COVID-19 pandemic.

Ethical Approval: Given

Conflict of Interest: The authors declare no conflict of interest.

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