Original Research Article

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Effectiveness of water, sanitation and hygiene-based programme on toilet etiquette and sanitation targeted at primary school children of Mumbai

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ABSTRACT

Background: As per the WHO-UNICEF monitoring report 2012, around 626 million people, or half of the population of India defecate in the open; this explains the high burden of communicable diseases in developing countries like India. In this context present study attempts to assess the effectiveness of school-based awareness programme on toilette etiquettes and sanitation in primary school-going children (mean age 9.27 years.) of Mumbai city.

Methods: This is a comparative, before and after study between the interventional group and the comparison group. The study was carried out between July 2016 to March 2017, end line survey was carried out approximate 3 months after programme intervention for both the groups. Stratified random sampling was used to select 3737 students in baseline and 3230 students in end line from 130 primary schools run by municipal corporation of greater Mumbai (MCGM).

Results: Knowledge and attitude significantly improved in the end line than the baseline survey exorbitantly for the interventional group than the comparison group. Although the comparison group also exhibited some improvement but there was a marked difference as when compared to the interventional group.

Conclusions: An innovative education cum entertainment intervention programmes on basic health and hygiene habits focused on toilette etiquettes and sanitation was conducted. This has influenced the KAP among primary school children of Mumbai city. Though individual behaviour is difficult to mould, short to medium term effects of innovative programmes like WASH are encouraging.

Keywords: Hygiene, Sanitation, School, Knowledge, Attitude, Practices

INTRODUCTION

As per WHO-UNICEF monitory report 2012, around 626 million people or half of the population of India defecate in the open. In such an environment, there is a very high risk of microbial contamination of water and food which leads to diseases such as diarrhoea. About 1.4 million children under the age of 5 die due to pneumonia, and another 0.525 million die due to diarrhoea every year

worldwide. The burden of preventable death occurring due to the aforementioned conditions is borne by the developing countries and can be easily avoided.^{2,3} Handwashing with soap is the single most effective and inexpensive way to prevent diarrhoea and acute respiratory infections such as influenza, common cold, and pneumonia.^{4,5}

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India is a developing nation, and around 70% of India's population is resides in rural areas. As a result, big cities like Mumbai attract a large number of migrants giving rise to slums, which puts a strain on basic amenities like health, sanitation, housing, etc.^{6,7} It has been found that people belonging to lower socioeconomic status are more vulnerable to diseases than others because of a lack of proper personal hygiene.⁸ Poor personal hygiene has been directly linked with worm infestations, diarrhoea, oral diseases, etc. This may result in nutritional deficiencies which indirectly affect the attendance and the academic performance of the children.⁹ Children studying in municipal schools mainly belong to low socioeconomic status. Therefore, these children require education and awareness for improving their hygiene-related behaviour and practices. With this premise, WASH based awareness programme was designed and implemented for these schools.

Purpose of the study

A review of different studies shows positive outcomes on knowledge, attitude, and practices (KAP) in personal hygiene post-intervention in school children. 10,11 Evaluation of short education intervention on oral and hand hygiene for pre-school children showed that even a short, school-based educational intervention at an early affect children's health promotion significantly. 12 Therefore, this programme was designed to educate children of primary schools as children at this age are amenable to new ideas, and the right habits can be inculcated to bring about long term behavioural change. Also, children are likely to pass on this information to their parents and family members. 13 This is in turn would make these children grow into adults who would make right choices for themselves and their family.

WASH (Water, sanitation, and hygiene) aims to provide awareness on clean drinking water and sanitation education to schools and children in underdeveloped regions. WASH based school health programme was designed with an aim to promote the importance of good hygienic practices of toilette etiquettes and sanitation among primary school going children of Mumbai.

The present study was primarily undertaken to measure the programme effectiveness and to know to what extent its objectives have been attained. The objectives were: 1. To assess the effectiveness of the program on students' knowledge and attitude 2. To evaluate the outcomes of the program on students' demonstrated handwashing behaviour.

METHODS

The design of this evaluation study was a comparative analysis between intervention and non-interventional groups before and after the IEC intervention. The study was carried out between July 2016 to March 2017 in the city of Mumbai. Municipal schools have an adequate

representation of children from low socio-economic strata of the society hence Municipal schools were chosen for the study. Also, the MCGM runs one of the expansive primary education systems in Asia. Therefore, this gives a platform to reach out to a large number of students. ¹⁴

Programme intervention: An information, education, communication (IEC) message was designed on toilette etiquette and sanitation, targeted at all the primary schools run by MCGM. It comprised of 45 to 50 minutes' presentation through an engaging story with illustrations of interesting characters to which children can relate to. The programme message of toilet etiquette and sanitation was interspersed along with the story. Interactive activities like games, songs, pledge, etc. were carried out for better participation. Giveaways like book labels and badges were distributed among students with the programme message printed on it. Set of informative posters were also put up on school walls for reinforcement of the programme message. This was the second message in year two of the programme series.

The study assessed the knowledge attitude and practice of toilette etiquettes and sanitation among selected primary school children of MCGM.

A conceptual framework for the intervention

The program was designed using the framework of health belief model (HBM) and used emotional drivers like habit, fear, disgust, and social acceptance which have been found to be very effective in eliciting behaviour change. 15-17 The constructs like perceived seriousness, perceived susceptibility, perceived benefits, and cues to action from HBM were used in the programme design.

Sampling

Stratified random sampling was used to select intervention and comparison schools, with the strata including different regions of Mumbai (city, Western suburbs, Eastern suburbs), in Figure 1. The strata were further divided into blocks and wards, and within every block, schools were selected randomly. It was envisaged to include 95 schools from the Interventional group and 35 schools from the comparison group. Due to school variation in terms of enrolment and attendance, finally, 94 schools were selected from the interventional group and about 36 schools were selected from the comparison group. Within selected schools, students were then selected randomly. The sample consists of 3rd, 4th, and 5th standard students from MCGM schools. It was planned to select 20 students from each school both for the Interventional group and control group. Due to small enrolment in some of the schools less no of students were interviewed, however, the same had to be compensated in bigger schools with interviews with more students, finally on an average about 30 students interviewed from each school. Due to poor attendance, some of the students who responded the baseline questionnaire were not available

for the end line one. Whenever possible, students from the same class who attended program sessions were substituted for the absent students.

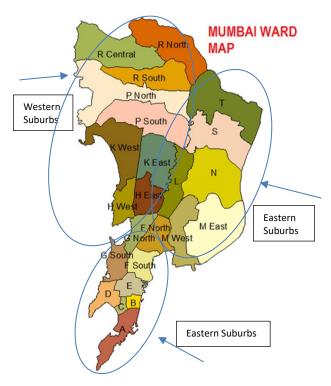


Figure 1: Mumbai ward map (Source: Social indicators through ward map, medium.com).

Inclusion criterion

Students studying in standard 3^{rd} , 4^{th} , and 5^{th} from selected MCGM schools were included in the study.

Exclusion criterion

Students from 1st and 2nd standards or those who are not part of inclusion criterion were excluded. Figure 2 summarises study design. While Figure 3 gives a glimpse of the IEC material used during programme session.

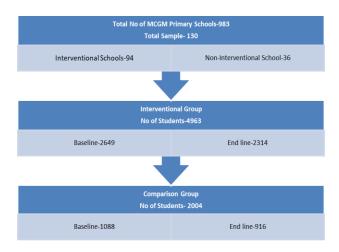


Figure 2: Summary of study design.



Figure 3: Collateral used for programme.

Sample size

The second top row of Table 1 presents the sample size of the study. For interventional group there were 2649 students in baseline and 2314 in the end line, thus a total of 4964 interviews were carried out for the interventional group. For comparison group there were 1088 students in baseline while 916 students were part of the end line, thus a total of 2004 interviews were carried out for comparison group. The sample size of the Interventional group was approximately 2.5 times that of the comparison group. This was so because operationally it was not feasible to conduct sessions of half of the comparison schools till the end line. Baseline data collection was done between July to September 2016 and the end-line data collection was done between January to March 2017.

Structured interview

A face-to-face interview with a structured questionnaire was conducted by trained field staff with students in the 3rd, 4th and 5th standards. The first section consisted of demographic information such as age, gender, parents' occupation and their academic qualification. The second section comprised of series of 11 questions that collected information on KAP about toilette etiquette and sanitation. Responses were predominantly dichotomous i.e., in Yes or No options. Further demonstration of proper handwashing steps was observed. Finally, the field staff conducted an examination of the respondent's hands to rate them on the cleanliness index. For cleanliness, hands were divided into palms, finger pads, and nails examination, with a minimum score of 1 and a maximum of 3.

Data analysis

Initial collection and transcription of data was conducted in SPSS. Demographic or background variables were tabled and illustrated in a simple percentage value for all the groups of the study. Chi-Square test was used to assess the difference between baseline and end-line KAP questions. Demonstrated steps of handwashing and hand hygiene index, both for the interventional group and comparison group. P value or significance value was set at <5%. Pearson's chi-square (value) from SPSS output was used to define significance.

Ethical issues

Permission was obtained from the concerned higher authorities. Approval from respective school principals and teachers was taken in every selected school. The study was explained in detail to the students and only those who were willing to participate were included. Also, they were given a choice to leave at any point in the interview. All the stakeholders were informed about the nature, scope, and purpose of the study. The same intervention/awareness session was conducted for schools from the comparison group as well after end-line study.

RESULTS

Table 1 presents the basic socio-demographic characteristics of the respondents. Hindi, Marathi, Urdu, and English dominated the medium of instruction in MCGM schools, the same is represented in the sample selected. 'Other' category comprises schools with other Indian languages namely Kannada, Telugu, Gujarati, etc. Standard: Students from the only 3rd, 4th, and 5th standards were included with the mean age of 9.27 years. for the study and the same is reflected in their distribution. There was almost an equal number of boys and girls selected in the study with girls being marginally higher, which is more or less representative of gender distribution in primary schools of Mumbai. The medium of instruction, standard, and gender distribution was more or less the same in baseline and end line for intervention and comparison group.

Parents' occupation was broadly categorized into highly-skilled, skilled, semiskilled, and unskilled. Occupational categories were based on the minimum wages act. The statistics for paternal occupation were more or less equally distributed, with one third of them employed in unskilled, semiskilled and skilled categories, each. There were no participants in the highly skilled category. It was observed that distribution of occupation before and after among the intervention and comparison groups remained the same. In the interventional group, approximately 26% of mothers belonged to the unskilled category while the majority of 63% were not working. In comparison group around 32% of mothers were unskilled and about 58% of mothers were not working.

Approximately 50% of the fathers had education up to the secondary level both for the interventional and comparison group. 41.8% of mothers from the interventional group and about 44.3% from the comparison group had education up to the secondary level. Higher education was almost negligible in both males and females among all the groups.

Table 2 presents responses to 11 questions to gauge the knowledge and attitude of respondents, where all the responses were dichotomous, while the last variable was the demonstration of steps of handwashing being observed by field staff.

For the interventional group, about 90.9% of respondents in baseline said handwashing can prevent sickness, which increased to 97.4% in the end line. While among the comparison group 89% of respondents in the baseline said handwashing can prevent sickness which increased to 93.4% in the end line. For the interventional group, 82.4% in baseline agreed that handwashing with water alone is not enough which increased up to 95.7% in the end line. Whereas for the comparison group 82.6% and 91.2% of the students answered that handwashing with water alone is not enough in the baseline and end line, respectively. For the interventional group, 75% answered

correctly that flies can transmit germs in baseline which increased to 92% in the end line, while for comparison group 76.3% answered correctly in baseline which increased up to 89.1% in the end line. About 53.5% answered correctly in the baseline that defecating in open causes the spread of germs which increased to 68.1% in the end line for the interventional group, and there was almost no change in response for the comparison group. For interventional group about 87.8% in baseline agreed that long nails can carry germs which became 93.8% in the end line, while there was no change seen for the comparison group. About 60.4% of respondents in baseline agreed that germs do enter the stomach through hands which increased to 67% in the end line for the interventional group while there was almost no change in the comparison group. For interventional group about 53.3% of respondents in baseline agreed that germs do enter the stomach from one person to another which increased to 56.2% in the end line, while for comparison group correct answer was actually declined. interventional group about 53.2% of respondents in the baseline agreed that hands should be dried after washing which increased to 57.5% in the end line, while for comparison group negative change was recorded. It was asked whether hands should be washed only if they look dirty, in response, 35.9% in baseline answered positively which went up to 43.4% in the end line, while for comparison group correct answer went down from 37.6% in baseline to 30.3% in the end line.

For interventional group 93% of the respondents in baseline said eating food without washing hands makes one sick which went up to 96.5% in the end line, which was statistically significant; while for the comparison group, correct answer increased from 93.5% in baseline to 94.9% in the end line, which wasn't statistically significant. About 94% of the interventional group knew proper handwashing steps in baseline which increased to 99.7% in the end line, while for comparison group it was 96.1% in the baseline which became 99.3% in end line.

Table 3 shows the hand washing steps demonstrated by respondents. Respondents were asked to demonstrate the

proper steps of hand washing; basic steps were expected through demonstration and the demonstration was rated as "poor, average, and good". Average performance almost doubled for the intervention group from 34.7% in the baseline to 64.3% in the end line. While for comparison group it increased from 29.7% in baseline to 34.7% in the end line.

Table 4 presents total score of knowledge and attitude. Responses to all the 11 questions on knowledge and attitude were clubbed together and recoded to arrive at the total score categories. For the interventional group, good and excellent responses increased from 45.4 and 25.2% in baseline to 63.1 and 31.2% in the end line, respectively.

For comparison group though, good responses increased from 50.8% in baseline to 70.7% in the end line, excellent responses actually decreased from 27% in baseline to 16.9% in the end line. A corresponding decrease was seen in the respective Poor and Average categories.

Table 5 gives the hand hygiene Index which is a dummy variable for practices. Manual observation of children's hands was carried out by interviewers. Both the hands were observed by the interviewers. A hand was divided into three parts-palms, finger pads, and nails. Each part of the hand rated in 3 categories for the cleanliness separately. Visibly dirty, apparently dirty and clean were the ratings. Visibly dirty coded as 1, apparently dirty coded as 2 and clean coded as 3. Further cleanliness rating for all the three parts were clubbed together to arrive at cleanliness score of the hand. There was significant improvement seen among the interventional group. Response to at least one part; clean improved from 23.2% in baseline to 27.4% in the end line for the interventional group. While the response to at least one part clean increased from 16.8 to 27.9% for the comparison group. Further, there were 0 people in baseline with all the parts clean for both the intervention group and comparison group, which improved to 21.7% for the interventional group and 19.7% for the comparison group in the end line.

Table 1: Demographic/background information.

Interventional group							Comparison group							
Variables	Baseline n=2649		End line n=2314		Total n=4963	Total n=4963		Baseline n=1088		End line n=916)4		
	N	%	N	%	N	%	N	%	N	%	N	%		
Medium														
Hindi	1129	42.6	1017	43.9	2146	43.2	394	36.2	280	30.6	674	33.6		
Marathi	748	28.2	642	27.7	1390	28.0	437	40.2	387	42.2	824	41.1		
Urdu	401	15.1	329	14.2	730	14.7	153	14.1	153	16.7	306	15.3		
English	343	12.9	301	13.0	644	13.0	72	6.6	65	7.1	137	6.8		
Other	28	1.1	25	1.1	53	1.1	32	2.9	31	3.4	63	3.1		
Standard of	Standard of respondents													
3 rd	903	34.1	762	32.9	1665	33.5	360	33.1	391	42.7	751	37.50		
4 th	976	36.8	867	37.5	1843	37.1	377	34.7	325	35.5	702	35		
5 th	770	29.1	685	29.6	1455	29.3	351	32.3	200	21.8	551	27.50		

Continued.

Interventional group								Comparison group						
Variables	Baseli		End li	ne	Total		Basel		End l	ine	Total			
variables	n=264		n=231		n=496		n=10		n=91		n=200			
	N	%	N	%		%	N	%	N	%	N	%		
Age of the res														
Mean (S.D)	9.18 (1		9.42 (1	.55)	9.29 (1	.49)	9.15 ((1.41)	9.37 ((3.28)	9.25 (2	2.45)		
Gender of the														
Male	1227	46.3	1054	45.5	2281	46	522	48	442	48.3	964	48.1		
Female	1422	53.7	1260	54.5	2682	54	566	52	474	51.7	1040	51.8		
Occupation o														
Unskilled	587	22.2	551	23.8	1138	22.9	289	26.6	275	30.0	564	28.1		
Semi-skilled	1073	40.5	731	31.6	1804	36.3	412	37.9	285	31.1	697	34.8		
Skilled	671	25.3	777	33.6	1448	29.2	241	22.2	239	26.1	480	24.0		
Highly Skilled	2	0.1	0	0.0	2	0	0	0.0	0	0.0	0	0.0		
Don't Know	208	7.9	152	6.6	360	7.3	98	9.0	76	8.3	174	8.7		
Expired	59	2.2	58	2.5	117	2.4	22	2.0	18	2.0	40	2.0		
Not Working	49	1.8	45	1.9	94	1.9	26	2.4	23	2.6	49	2.4		
Occupation of respondent's mother														
Unskilled	613	23	660	29	1273	26	324	30	324	35	648	32		
Semi-skilled	185	7	117	5	302	6	60	6	30	3	90	4		
Skilled	89	3	67	3	156	3	37	3	23	3	60	3		
Don't know	25	1	19	1	44	1	8	1	20	2	28	1		
Expired	21	1	19	1	40	1	9	1	6	1	15	1		
Not working	1716	65	1432	62	3148	63	650	60	513	56	1163	58		
					01.0		323		0.10		1100			
Primary	Education of respondent's father Primary 457 17.3 534 23.1 991 20								205	22.4	402	20.1		
Secondary	740	27.9	782	33.8	1522	30.7	197 324	18.1 29.8	287	31.3	611	30.5		
Higher			102			30.7			201					
Secondary	153	5.8	146	6.3	299	6	73	6.7	67	7.3	140	7.0		
Higher	19	0.7	20	0.9	39	0.8	16	1.5	10	1.1	26	1.3		
Illiterate	194	7.3	143	6.2	337	6.8	93	8.5	76	8.3	169	8.4		
Don't know	1086	41	633	27.4	1719	34.6	385	35.4	251	27.4	636	31.7		
NA	0	0	56	2.4	56	1.1	0	0.0	20	2.2	20	1.0		
Education of														
Primary				27.1	1170	23.6	248	22.8	235	25.7	483	24.1		
Secondary	412	15.6	493	21.3	905	18.2	211	19.4	196	21.4	407	20.3		
Higher Secondary	79	3.0	79	3.4	158	3.2	10	0.9	19	2.1	29	1.4		
Higher	9	0.3	11	0.5	20	0.4	4	0.4	5	0.5	9	0.4		
Illiterate	426	16.1	366	15.8	792	16.0	168	15.4	144	15.7	312	15.6		
Don't know	1179	44.5	708	30.6	1887	38.0	447	41.1	307	33.5	754	37.6		
NA	0	0	31	1.3	31	0.6	0	0.0	10	1.1	10	0.5		

(n-sample size, No.- Number of Participants, %-Percentage)

Table 2: Knowledge and attitude.

Knowledge and atti	itude qu	estions									
Response	Interve	entional grou	1р			Comp	arison grou	і р			
	Baseline n=2649		End line n=2314		P	Baseline n=1088		End li	End line		
					value			n=916		value	
	N	%	N	%		N	%	N	%		
Can hand washing	prevent	sickness?									
Correct answer	2408	90.9	2253	97.4	0.000	968	89.0	856	93.4	0.000	
Is handwashing wit	h water	alone enoug	h for pre	venting dise	ases?						
Correct answer	2182	82.4	2214	95.7	0.000	899	82.6	835	91.2	0.000	

Continued.

Knowledge and atti	tude que	estions									
	Interventional group					Comparison group					
Dagnanga	Baseline		End line	End line		Baseline		End line		P	
Response	n=2649	1	n=2314		value	n=1088	n=1088			r value	
	N	%	N	%		%	N	%	N	value	
Can flies transmit g	erms fro	om faeces to	food?								
Correct answer	1986	75.0	2130	92.0	0.000	830	76.3	816	89.1	0.000	
Defecating in open of	does not	cause the sp	read of g	erms							
Correct answer	1418	53.5	1575	68.1	0.000	692	63.6	578	63.1	0.816	
Can long nails carry	y germs?	?									
Correct answer	2327	87.8	2170	93.8	0.000	969	89.1	815	89.0	0.95	
Germs do not enter	the ston	nach throug	h hands								
Correct answer	1599	60.4	1551	67.0	0.000	643	59.1	539	58.8	0.907	
Germs do not sprea	nd										
Correct answer	1412	53.3	1300	56.2	0.042	598	55	397	43.3	0.000	
There is no need to	dry han	ds after was	hing								
Correct answer	1409	53.2	1330	57.5	0.002	692	63.6	473	51.6	0.000	
Should hands be wa	shed on	ly if they loo	k dirty?								
Correct answer	952	35.9	1004	43.4	0.000	409	37.6	278	30.3	0.001	
Does eating food wi	thout wa	shing hands	s makes o	ne sick?							
Correct answer	2463	93	2233	96.5	0.000	1017	93.5	869	94.9	0.186	
Do you know the pr	oper ste	ps of hand v	vashing?								
Correct answer	2490	94	2308	99.7	0.000	1046	96.1	910	99.3	0.000	
Number of hand wa	ashing st	eps demonst	rated								
Poor	1682	63.5	789	34.1		754	69.3	595	65.0		
Average	918	34.7	1487	64.3	0.000	323	29.7	318	34.7	0.013	
Good	49	1.8	38	1.6		11	1.0	3	0.3		

(n-sample size, No.- Number of Participants, %-Percentage, p<0.05).

Table 3: Total score of knowledge and attitude.

Total score of kno	wledge a	nd attitude								
Interventional group					P	Comp	arison group)		P
Response	Baseline n=2647		End line n=2314		value	Baseli	ne n=1088	End li	value	
_	N	%	N	%		N	%	N	%	
Poor	35	1.3	1	0.0		11	1.0	6	0.7	0.000
Average	744	28.1	130	5.6	0.000	230	21.1	107	11.7	
Good	1201	45.4	1460	63.1		553	50.8	648	70.7	
Excellent	667	25.2	723	31.2	_	294	27.0	155	16.9	_

(n-sample size, No.- Number of Participants, %-Percentage, p<0.05)

Table 4: Hand hygiene index.

Hand hygiene index												
Recoding of hand hyg	giene sco	re (obser	ved)									
Rating	Codin	Coding										
3	All par	rts dirty										
4-6	At leas	st one par	t dirty									
7-8	At leas	At least one part clean										
9	All par	All parts clean										
	Interv	entional	group			Comparison group						
Observed	Baseli	Baseline		End line		Baseline n=1088		End line n=916		P		
categories	n=264	n=2647		n=2314						-		
	No.	%	No.	%	value	No.	%	No.	%	value		
All parts dirty	138	5.20	296	12.80	_	68	6.30	71	7.80	0.000		
At least 1 part dirty	1896	71.60	880	38.00	0.000	837	76.90	409	44.70			
At least 1 part clean	615	23.20	635	27.40	0.000	183	16.80	256	27.90	0.000		

DISCUSSION

Hindi, Marathi, Urdu, and English dominated the medium of instruction among MCGM schools, and the same is reflecting amongst the sample selected. Though the programme targeted at 1st to 5th standard, students from the only 3rd, 4th, and 5th standard were selected for the study due to better comprehension, with the mean age of 9.2 years. Almost equal number of boys and girls were included, with girls being marginally higher. Around 26% of mothers from the intervention group and around 32% of mothers from comparison groups were unskilled workers, around 60% of mothers were not working. Approximately 30% of fathers were educated up to the secondary level and anther 20% were educated only up to the primary level. While less than 24% of mothers were educated up to primary level and less than 20% up to secondary level. Education and occupation of parents substantiate the lower socioeconomic status of respondents.

Knowledge and attitude questions on toilette etiquettes and sanitation were about the importance of handwashing, and faeco-oral transmission of the diseases and hence the importance of toilette etiquettes and sanitation. This was the second year of study and was a follow-up and complementary to first year's programme on hand washing and personal hygiene. This study underlines the findings of an earlier study that a health education program when clubbed with entertainment and interaction can bring about a positive shift in KAP which is otherwise difficult to bring about.¹⁸

Out of the 11 KAP questions, 7 were related to knowledge while 4 intended to gauge attitude. For those who said they know proper steps of hand washing, were requested to make a demonstration of proper handwashing steps, which was recorded separately. For almost all the variables change between baseline and endline was significantly positive for the interventional group, while for the comparison group the same was not true. Either comparison group recorded no change or sometimes negative change between baseline and end line; and though positive changes were seen in a couple of variables comparative depth was more in the interventional group.

All 11 KAP questions were clubbed together and a common total score was formed and then recoded into Poor, Average, Good and Excellent categories. For the interventional group, good and excellent responses increased from 45.4 and 25.2% in baseline to 63.1 and 31.1% in the end line, respectively. While for comparison group though good responses increased from 50.8% in baseline to 70.7% in the end line, excellent responses actually decreased increased from 27% in baseline to 16.9% in the end line. This finding underlines the programme effectiveness in knowledge shift in participating students.

Significant improvement was also seen for recommended minimum steps of handwashing demonstrated in baseline and end line. "Good" or highest category remained more or less the same between baseline and end-line both for interventional group and comparison group. However, very significant improvement was seen for the "Average" category for the interventional group from 34.7% in the baseline to 64.3% in the end line. While for comparison group it improved a bit from 29.7% in baseline to 34.7% in the end line.

Similarly, results of the hand hygiene Index were encouraging. There was no one with all parts clean in the baseline for both the groups which improved to 21.7% for the interventional group and 19.7% for the comparison group. While at least one part clean was improved from 23.2% in the baseline to 27.4% in the end line for the interventional group and 16.8% in the baseline to 27.9% in the end line for the comparison group. The improvement in the comparison group can be partly attributed to the sensitization in the baseline survey and some exposure or recall of health and hygiene promotion messages.

Present study findings are similar to some of the recent school and community-based studies conducted in other parts of the country. Garg et al conducted a study involving 300 students after the handwashing promotion programme for 6th to 8th standard. There was a significant improvement in the knowledge regarding hand-washing and frequency of hand-washing practices after the intervention. The correct technique improved from 32.4% in the baseline to 68% in the end line, hand washing practice score improved from 1.17 in baseline to 1.67 in the end line, also around 42% children shared this information with their parents as well.¹³

Shreshtha et al concluded that proper implementation of the health education programme changed the behaviour of school children in South India. A study conducted on a sample of 96 students of 3rd, 4th, and 5th-grade students showed a significant increase in mean knowledge and practices score from 53.8 to 77.5 and 41.4 to 60.6 respectively after the intervention.¹¹ Further, Siwach in rural Panipat, 2009 found that the mean differences in the pre-test and post-test scores for knowledge and practices were higher in the experimental group while no such significant difference was found in the control group.¹⁹

Present study intervention or IEC is based on health belief model, which is similar to the Biran et al study who used emotional drivers like disgust, nurture, status, affiliation in their Super Amma campaign in Andhra Pradesh and observed a positive behavioural change by 31% in the interventional group as compared to the control group after 6 months. However, the difference was narrowed at the end of 12 months. The present study has assessed KAP after 3 months of programme, it would be inquisitive to evaluate KAP after 12 months or longer to assess the long-term effectiveness of programme.

Strengths and limitations

This is a unique study on handwashing and toilette etiquettes among primary school children in Mumbai or the western part of the country. The yearlong study was conducted on a large randomly selected sample. Hand hygiene index is actually observed parameter of cleanliness for student' hands. It is a more reliable measure of programme effectiveness than improvement in knowledge alone.

Present programme intervention is limited to the IEC, no infrastructure need including supply of soap is addressed here. However, given the urban setting of programme it was assumed that water and soap availability was not a constraint and MCGM schools have infrastructures like toilets, washbasins, and water. Further, the importance of plain education programme is underlined by Bowen et al. who conducted a school-based study in Fujian province of China and found both a standard education programme comprising plain education, and enhanced education programme comprising health education with supply of soap to schools are effective in reducing illness episodes and absenteeism.²¹

The results should be viewed with a necessary degree of caution associated with self-reported behaviours. Since this study was respondent-driven, it is possible to assume that there might be over-reporting of "proper behaviour" leading to social desirability bias in which the participants tend to report behaviour that may be culturally or socially accepted. The degree of causation needs to be observed while generalizing these findings to private schools as the study population mainly comprised of children from low-income groups.

CONCLUSION

It can be concluded that an IEC programme or a school awareness programme has positively influenced the KAP of children on the message of toilette etiquette and sanitation. All three sections i.e., knowledge and attitude questions, hand washing steps demonstration, and hand hygiene index have shown to have improved among Intervention group than the comparison group. Some improvements in the comparison group are likely to be on account of sensitization in the baseline survey and some exposure to hygiene promotion messages.

Further, this makes a strong case to replicate this model in the other parts of the country both in urban and rural areas to influence health behaviour. Critical messages when delivered in innovative ways can have a longer retention span as they stand out from other messages delivered through routine teaching methods.

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