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COVID-19 prevention in a settlement colony in Kolkata

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ABSTRACT

Background: The scourge of ongoing COVID-19 pandemic is a matter of public health concern. COVID-19 spreads via aerosolised respiratory droplets ejected during coughing, sneezing and even loud speaking. Transmission through contaminated hand or personal objects is also possible. In absence of explicit anti-viral medicines and vaccine, humans needed to resort to preventive life-style like use of mask, repeated hand washing, social distancing and hygienic way of coughing-sneezing. Considering a possible upsurge of COVID-19 in India, it was decided to study the knowledge and awareness on COVID-19 prevention and its practice among the residents in a settlement colony in Kolkata.

Methods: 277 adult residents of a settlement colony in Kolkata were studied during 2^{nd}-3^{rd} week of March 2020. Approval from local authority and consent of head of the family were obtained. A pretested structured questionnaire was introduced including demographic attributes and knowledge-awareness-practice (KAP) traits of COVID-19 prevention. The data obtained was tabulated and statistically analysed.

Result: The community had 380 members including 125 children having sex ratio 948.7 and 1.3 children per family. All adult members were literate and majority (47.3%) belonged to lower socio-economic group. Awareness of respondents on COVID-19 was remarkable. More than 93% subjects knew about COVID-19 illness besides 85% and above about common preventive measures. Around 93-95% subjects knew the value of hand washing, wearing mask and social distancing. However, there was mixed response to acceptance of preventive behaviour. While daily bath (100%), avoidance of public spitting (77.6%), cough hygiene (92.4%) and shunning hand-shake/hugging (92.7%) were followed by higher proportion of residents; hand washing (55.2%), wearing mask (52.3%) and social distancing (52.3%) got limited no. of acceptors. Significantly high proportion of matriculates belonging to lower middle socio-economic class displayed desirable practices of hand washing 2-3 times a day, using mask amid avoiding spitting in public.

Conclusion: Further research is recommended to enrich this effort to explore facts that may play vital role in COVID-19 prevention in future.

1. Introduction

COVID-19 pandemic has taken the mankind to surprise and surged like a wild fire over the continents. Around 4.2 million got infected causing 2.9 lakh deaths by mid May 20 globally aside US spearheading with estimated 18 lakh cases and India having 74K cases.[1] India reported first COVID-19 case on January 30, 2020 and numbers began to rise in late March 2020.[2] The virus spreads through respiratory droplets and by close contact from person to person.[3] In absence of definitive anti-viral therapy and vaccine, human population needed to resume to prophylactic measures like use of mask and gloves, repeated hand washing, social distancing, hygienic way of coughing-sneezing and safe disposal of waste[3] West Bengal followed the stringent lock-down since 25 Mar 20, however had 2290 cases with 207 deaths till mid May 20.[4] COVID-19 spreads via droplets ejected during coughing, sneezing and even speaking; therefore, use of mask may help decrease the chance of direct transmission facilitating everyone being protected.[5] Kolkata is a highly populous

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city with sprawling business, shops, markets and indulgent hawkers amidst stingy residential and settlement areas with warm sultry climate. Keeping in mind the possible evolution of COVID-19 spate in Kolkata, it was decided to ascertain knowledge, awareness and observance of certain personal protective measures for COVID-19 prevention among the residents of a settlement area in south Kolkata.

2. Materials and Methods

Study was conducted in a settlement area for displaced persons in south Kolkata during second & third week of March 2020. There were 102 built-up units within the premises of the colony housing 96 families having 380 members in total. Clearance was obtained from local authority for conduct of study among the said residents. A structured questionnaire was prepared after reviewing available literature on the issue including local factors. The Questionnaire comprised of two parts i.e. personal particulars including socio-demographic attributes of the residents and details of knowledge about personal protective measures against COVID-19 including preventive behaviour with associated ancillary factors, if any. Socio-economic status (SES) was determined as per recent scale.[6]

A prior date-schedule was made for cluster of residences (8-10 person per session) intimating the residents in small groups after explaining study purpose and at the same time informed consent was taken from each participant. The questionnaire was introduced to the members in small group at a time maintaining confidentiality. Name, address and mobile no. were coded ensuring confidentiality, but the record of the same was maintained to avert repetition securing authenticity of information. Standard precautions including social distancing to avoid COVID-19 were followed. The data obtained was tabulated and statistically analysed. Common statistical applications were used to determine significance of certain variables as appeared appropriate.

3. Results

The settlement area is located by the eastern flank of south sub-urban railway track in close proximity to a railway station. Houses are generally masonry structure with shack-roof although few of them are totally make-shift type. Common toilets, public water supply point, water hand-pump and street lights are available but not enough to make good for the residents. Drainage system is open and garbage disposal appeared irregular.

Table 1 shows that there were 195 male members as against 185 females making a sex ratio of 948.7.125 children in the age group of 1-18 years made to 1.3 children per family (114 in 1-14 year and 11 children in 15-20 year). There were 95(25%) earning male members mostly working in shops, small scale industries, private offices, hospitals and others (cleaning and security staff) all attending work during day/night shift as scheduled. 66(17.3%) female members stated working as domestic help and some in local hospitals or agencies as attendants/ nurses. There were 08 (2.1%) partially disabled/handicapped individuals and 21 (5.5%) non-earning males in the age range of 30-55 years. 85.2% families belonged to Hindu religion and majority of the families (47.3%) appertain to lower income group (Table 2). Majority of adult members (36.5%) were educated up to primary standard followed by 33.5% up to middle school. All the members including both genders were literate (Table 3). Out of 114 children in the age group of 1-14 years, 68(59.6%) found attending school.

Awareness of the respondents on COVID-19 was quite plentiful (Table 4). Majority (93.8%) stated acquired the information from television broadcasts and large public hoardings. Gratifyingly, about 87% discussed the issue among family members. 93-95% subjects knew about the mode of spread, infectiousness and fatal outcome of COVID-19 in elderly. 95.3% were aware of the importance of repeated hand washing and 93.8% responded correctly about the value of wearing mask in averting COVID-19 transmission. 93.8% had correct perception about merit of social distancing aside daily bathing and upkeep of personal hygiene. However, awareness indicators for spitting in public places (86.3%), wearing of gloves (87.3%), use of sanitizers (88.5%) and avoidance of hand shaking and hugging (85.6%) were found wanting and significantly low among the women. 91.7% responded well about hygienic way of coughing and sneezing in public. 95.3% stated correctly when to suspect and report to health authorities beside benefit of staying home.

Preventive behaviour among residents (Table 5) revealed a significant difference in hand washing and masks wearing practices amid the genders. Higher percent of women washed hand with soap and water twice or thrice a day; significantly more proportion of male members used mask while going out for work or other needs. Overall 55.2% washed hands twice a day, 36.1% washed hands thrice a day and 52.3% each donned mask and maintained social distancing. Only 14(5.5%) males working in shops used gloves. All (100%) stated taking bath and changing to fresh clothes daily. 77.6% stated not spitting in the public without much difference between the genders. Hand sanitizer was not being used by any of the residents. While 92.4% followed cough discipline, 92.7% didn't indulge in personal touch or hug with anyone.

Table 6 shows that significantly high proportion of residents educated up to secondary level demonstrated desirable practices in regard to handwashing 2-3 times a day, using mask and not spitting in public. Above 51% members from each educational group stated to have maintained social distancing. All the subjects took regular bath and changed to fresh clothes daily. 97.4% graduates,

Table 1: Age & sex distribution of the residents

Age group in years	Gender		Total No. (Percent)
	Male	Female	
1-5	22	26	48(12.63)
6-14	37	29	66(17.37)
15-29	50	44	94(24.74)
30-44	50	48	98(25.79)
45-59	31	29	60(15.79)
60 +	5	9	14(3.68)
Total	195(51.32)	185(48.68)	380

Table 2: Socio-economic status and religion

Socio-economic status	Religion		Total
	Hindu	Muslim	
Middle	37	11	48(12.63)
Lower middle	128	24	152(40.00)
Lower	159	21	180(47.36)
Total	324(85.26)	56(14.74%)	380

Table 3: Education status of adult residents

Educational qualification	Gender		Total
	Male	Female	
Graduate & above	25	14	39(14.66)
Secondary	21	20	41(15.41)
Middle School (VIII Std)	41	48	89(33.46)
Primary	49	48	97(36.47)
Total	136(51.13)	130(48.87)	266

90.3% matriculates and 91.9% of under-secondary lots followed cough hygiene meticulously. 94.8% graduates, around 92.3% each in matriculate and under-secondary assembles didn't pander in hand shaking or hugging. No one stated using hand sanitizer and very few confirmed using gloves.

Washing of hands with soap and water for 2 to 3 times, use of masks and avoidance of public spitting were observed significantly more among lower middle class subjects (Table 7). In contrast, social distancing was found significantly more followed among lower SES class. Daily bath was universal among the members. Cough hygiene and avoidance of physical contact greetings were above 91% in all the SES classes.

4. Discussion

The community studied had demographic structure, age-sex composition, sex ratio and family size comparable to pan-Indian statistics.[7] All 266 adult members were literate; the literacy rate in West Bengal has been documented as 77.08%.[8] 95(84%) of 113 male members in the age group of 20-59 were working aside 66(64%) of 103 women in working age group contributed to family income. High literacy, small family together with dual income depicted the sign of trying human development and modernisation of Kolkata slum even though the civic provisions could not match up to the mark.

Knowledge of the residents on COVID-19 and its prevention in the present study was surprisingly high at a time when the contagion was yet to show aggression in India. High literacy, presence of working women and many school going children in the community appear contributory. 93.8% attained the information from television and public display. About 87% discussed the issue among family members especially with the children. A similar study documented that participants gathered facts on COVID-19 from social media (48.1%) and news channel (26.9%).[9]

93-95% subjects were aware about transmission, infectivity and criticality of elderly people affected with COVID-19. An earlier study noted that 87.3% subjects were acquainted with the contagiousness, 57.1% knew the incubation period and cent-percent were familiar with symptoms of COVID-19.[9]In the present intent, 93-95%residents were resplendent of the importance of repeated hand washing, value of wearing mask, worth of social distancing aside daily bathing and upkeep of personal hygiene. However, only 85-88% members knew about ill effects of spitting in public, importance of wearing of gloves, use of sanitizers and avoidance of hand shaking and hugging. It has been annotated earlier that washing hands and use of alcohol-based sanitizer (23.3%), hygienic

Table 4: Awareness on COVID-19 and its prevention

Awareness indices (n-277)	Awareness according to gender		Total (No. & percent) p value
	Male (n1-142)	Female(n2-135)	
Attended any talk or program on COVID-19 or Corona Virus	75 (27.06)	82 (29.60)	157(56.68) Chi-sq 1.77 NS
Seen health advocacy on TV & public advertisement	135 (48.74)	125 (45.13)	260(93.86) Chi-sq 0.74 NS
Often discussed by family members	126 (45.48)	116 (41.88)	242(87.36) Chi-sq 0.49 p<0.05
COVID-19 spreads through cough & sneezing	134 (48.37)	125 (45.13)	259(93.50) Chi-sq 0.36 NS
Drops of saliva get in air during cough & sneezing & infect other	134 (48.37)	127 (45.84)	261(94.22) Chi-sq 0.01 NS
COVID-19 is very infectious	136 (49.09)	128 (46.21)	264(95.31) Chi-sq 0.14 NS
COVID-19 causes death among elderly	134 (48.37)	127 (45.84)	261(94.22) Chi-sq 0.01 NS
Washing hand with soap & water repeatedly prevent COVID-19	136 (49.09)	128 (46.21)	264(95.31) Chi-sq 0.14 NS
Wearing mask while going out for daily need prevent COVID-19	134 (48.37)	126 (45.49)	260(93.86) Chi-sq 0.13 NS
Importance of keeping 01 meter distance from others in streets, markets & public places	134 (48.37)	126 (45.49)	260(93.86) Chi-sq 0.13 NS
Importance of wearing gloves in market places & shops	130 (46.93)	112 (40.43)	242(87.36) Chi-sq 4.62 p<0.05
Importance of daily bath & good personal hygiene	134 (48.37)	126 (45.49)	260(93.86) Chi-sq 0.13 NS
Importance of not to spit in public places	129 (46.57)	110 (39.71)	239(86.28) Chi-sq 5.13 p<0.05
Use of alcohol based sanitizer to disinfect hand	132 (47.65)	113 (40.79)	245(88.45) Chi-sq 5.80 p<0.05
To cover mouth & nose in case of cough & sneezes	130 (46.93)	124 (44.77)	254(91.70) Chi-sq 0.01 NS
Not to shake hand or hug friends or relatives	128 (46.21)	109 (39.35)	237(85.56) Chi-sq 4.95 p<0.05
To report to nearest health centre in case of cough, cold, fever, breathing difficulty & loose motion	136 (49.09)	128 (46.21)	264(95.31) Chi-sq 0.14 NS
Not to go out of home without necessity	136 (49.09)	128 (46.21)	264(95.31) Chi-sq 0.14 NS

Note - n=277 (266 adults and 11 children studying in higher classes in 9^{th}& 10^{th} grade)
All percentage calculated out of 277

way of coughing/sneezing along with use of mask (19.6%), social distancing (16.1%) and following all preventative measures collectively (40.2%) can ward off COVID-19.[9] 91-95% responded well about disciplined way of coughing and sneezing and when to report to health authorities beside benefit of staying home.

The study unveiled significantly higher proportion of women washed hands with soap and water as compared to men; and men used mask significantly more while going out for work. It is possible that spending more time home facilitated the former whereas outdoor work compelled the latter to wear mask. Overall 55% washed hands twice a day and 52% each used mask and retained social distancing. Bathing and changing to fresh clothes were universal. 77% didn't spit in public and hand sanitizer was not being used. Around 92%each followed cough discipline and non-indulgence in personal touch or hug. It emerges inopportune that even tall index of knowledge couldn't reiterate good preventive practice. In India with approximately 80% people employed in informal sectors, implementation of personal

Table 5: Gender based preventive practices to avert COVID-19

Safety measures (n-277)	Compliant no. & percent		Total (No. & percent) p value
	Male (142)	Female (135)	
Washing hand with soap & water twice, at least before meals	70 (49.30)	83 (61.48)	153(55.23) Chi-sq 4.16 p<0.05
Washing hand with soap & water 3 times or more everyday	43 (30.28)	57 (42.22)	100(36.10) Chi-sq 4.28 p<0.05
Wearing mask while going out for daily need or work	84 (59.15)	61 (45.19)	145(52.35) Chi-sq 5.41 p<0.05
Keeping 01 meter distance from others in shops, markets & public places	75 (52.82)	70 (51.85)	145(52.35) Chi-sq 0.02, NS
Wearing gloves in market places & shops	14 (9.86)	-	14(5.05)
Taking daily bath & maintaining personal hygiene	142 (100.00)	135 (100.00)	277(100.00)
Not spitting in public places	109 (76.76)	106 (78.52)	215(77.62) Chi-sq 0.12 NS
Using alcohol based sanitizer to disinfect hand	-	-	-
Covering mouth & nose in case of cough & sneezes	132 (92.96)	124 (91.85)	256(92.42) Chi-sq 0.12 NS
Not shaking hand or hugging anyone	132 (92.96)	125 (92.59)	257(92.78) Chi-sq 0.01 NS

Percentage calculated column wise

Table 6: Qualification based preventive practices to avert COVID-19

Safety measures (n-277)	Compliant by qualification			Total (No. & percent) p value
	Graduate (39)	Secondary (52)	Less than secondary (186)	
Washing hand with soap & water twice, at least before meals	25 (64.10)	45 (86.54)	83 (44.62)	153(55.23) Chi-sq 30.3 p<0.05
Washing hand with soap & water 3 times or more everyday	20 (51.28)	29 (55.77)	51 (27.42)	100(36.10) Chi-sq 18.7 p<0.05
Wearing mask while going out for daily need or work	20 (51.28)	36 (69.23)	89 (47.85)	145(52.34) Chi-sq 7.46 p<0.05
Keeping 01 meter distance from others in shops & markets	20 (51.28)	27 (51.92)	98 (52.69)	145(52.34) Chi-sq 0.03, NS
Wearing gloves in market & shops	14(35.90)	-		14(5.05)
Taking daily bath & maintaining personal hygiene	25 (100.00)	52 (100.00)	186 (100.00)	277(100.00)
Not spitting in public places	29 (74.36)	48 (92.31)	138 (74.19)	215(77.62) Chi-sq 7.95 p<0.05
Using alcohol based sanitizer	-	-		-
Covering mouth & nose in case of cough & sneezes	38 (97.44)	47 (90.38)	171 (91.94)	256(92.42) Chi-sq 1.77 NS
Not shaking hand or hugging anyone	37 (94.87)	48 (92.31)	172 (92.47)	257(92.78) Chi-sq 0.30 NS

Percentage calculated column wise

Table 7: SES based preventive behaviour to avert COVID-19

Safety measures (n-277)	No. & percent of compliant by SES			Total (No. & percent) p value
	Middle (35)	Lower middle (111)	Lower (131)	
Washing hands with soap & water twice, at least before meals	20 (57.14)	72 (64.86)	61 (46.56)	153(55.23) Chi-sq 8.20 p<0.05
Washing hand with soap & water 3 times or more everyday	16 (45.71)	53 (47.75)	31 (23.66)	100(36.10) Chi-sq 16.71 p<0.05
Wearing mask while going out for daily need or work	20 (57.14)	69 (62.16)	56 (42.75)	145(52.35) Chi-sq 9.45 p<0.05
Keeping 01 meter distance from others in shops, markets & public places	20 (57.14)	47 (42.34)	78 (59.54)	145(52.35) Chi-sq 7.50 p<0.05
Wearing gloves in market places & shops	14 (35.90)	-		14(5.05)
Taking daily bath & maintaining personal hygiene	35 (100.00)	111 (100.00)	131 (100.00)	277(100.00)
Not spitting in public places	27 (77.14)	95 (85.59)	93 (71.00)	215(77.62) Chi-sq 7.37 p<0.05
Using alcohol based sanitizer to disinfect hand	-	-	-	-
Covering mouth & nose in case of cough & sneezes	32 (91.43)	105 (94.59)	119 (90.84)	256(92.42) Chi-sq 1.26 NS
Not shaking hand or hugging anyone	33 (94.29)	104 (93.69)	120 (91.60)	257(92.78) Chi-sq 0.53 NS

Percentage calculated column wise

hygiene and public health behaviours such as hand-washing, use of sanitizer and social distancing to curb COVID-19 will be exigent no doubt.[2]

The study unfolded that significantly high proportion of matriculates belonging to lower middle SES exhibited desirable practices of hand washing 2-3 times a day, using mask while outdoor amid avoiding spitting in public. Above 51% members from each educational group upheld social distancing. Regular bath and changing daily to fresh clothes were universally practiced. About 91% and above in each educational and SES lot followed cough hygiene strictly beside shunning hand shake or hugging.

The present work portrayed impressive exhibition of knowledge on COVID-19 prevention among the community members, however its application didn't commensurate with the expectations. The gap between the knowledge and behaviour may be explained by the supposed subjacent threat from the contagion in early evolutionary phase as perceived by the people. Certain societal norms enforced by the authority like use of mask and social distancing was adhered to compellingly but actions needing expenditure and effort (sanitizer and hand washing) were guardedly accepted.

Being a limited study in an urban slum, it is pertinent to mention that the results may not stand enough universally. Exclusivity of the theme under the odds of a possible impending loom by virulent contagion overcast by progressing global threat precluded citing of several references due to scarcity of literature. However, the effort generated valuable information about COVID-19 prevention among the commons and further research is recommended to complement this endeavour to explore factors that may play important role in COVID-19 prevention in global communities in near future.

5. Source of Funding

None.

6. Conflict of Interest

None.

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