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Impacts of SARS on health-seeking behaviors in general population in Hong Kong

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Abstract

Background. The severe acute respiratory syndrome (SARS) epidemic that occurred in Hong Kong in 2003 caused serious public health consequences. Its impacts on health-seeking behaviors of the general public have not been assessed.

Methods. Two cross-sectional, random telephone surveys interviewed 1603 Hong Kong adult residents in the post-SARS epidemic period, June and September 2003 to investigate changes in the post-SARS period.

Results. Noteworthy percentages of the respondents self-reported increased frequencies of practicing favorable health-seeking behaviors in June 2003, as compared with the pre-SARS period. Few respondents reported the opposite. This was observed in different dimensions: health services seeking, adoption of healthier lifestyle, spending more resources on health, adoption of good personal hygiene, mask use when ill with influenza, and avoidance of risk behaviors. The frequencies of practicing most of these health-seeking behaviors, as measured in June and September 2003, were comparable. Further increases in healthy diet and weight control, etc., were observed during that period. Those who worried about contracting SARS were more likely to have improved health-seeking behaviors.

Conclusions. The community in Hong Kong responded to the SARS epidemic by practicing more favorable health-seeking behaviors. Public health workers should utilize these opportunities to foster favorable changes.

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Introduction

SARS was a newly emergent global epidemic that affected 29 countries in 2003. A total of 8422 cases and 916 deaths were reported worldwide [1]. In February 2003, a Chinese doctor stayed in a hotel in Hong Kong and infected seven guests who subsequently transmitted the disease to Canada, Singapore, and the United States [2]. Different hypotheses have been suggested for its mode of transmissions including aerosol dispersion [3], environmental contamination [4], and inter-species transmission [5,6]. Nosocomial transmission was an early-noted feature of the disease with about 20% of the cases in the world belonging to this category [1]. In September 2003, one new SARS case was reported in Singapore [7] and from

December 16, 2003 through April 30, 2004, another 14 new SARS cases were reported in four areas in China (Taiwan, Guangdong, Beijing, and Anhui) [8–10]. It is still uncertain whether there will be any resurgence of SARS in other parts of the world.

Hong Kong was one of the worst affected cities in the global SARS epidemic. With 1755 patients and 298 resulting deaths, the Hong Kong epidemic constituted 20.8% of the global number of cases and 36.7% and of worldwide deaths from SARS [1]. The first outbreak in Hong Kong occurred in the Prince of Wales Hospital, around March 10, 2003, which resulted in a total of 138 cases [11]. The peak of the epidemic in Hong Kong maybe seen to have occurred on April 1, 2003. Around this time, 33.5% of the population expressed concern that he/she or his/her family members would contract the disease and 75.0% would avoid visiting hospitals. Moreover, 57.1% avoided going outside [12]. School classes were also suspended from March to May, 2003 [13,14]. The last

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SARS case was reported in Hong Kong on June 11, 2003 [15] and the WHO lifted the advisory against travelling to Hong Kong on May 23, 2003 [16].

A matched case-control study showed that public health measures, such as mask-wearing, home disinfection, and frequent hand-washing were protective factors [17]. In the Hong Kong, 11.5%, 61.5%, and 36.4% of the population wore masks in public places, washed their hands frequently, or disinfected their living quarters, respectively, and the corresponding figures increased sharply to 84.3%, 95.1%, and 69.4%, respectively over a 10-day period [12].

A number of these personal hygiene behaviors may have become lasting, habitual behaviors even in the post-SARS period. Furthermore, health awareness and positive health-related behaviors may have spilled over to other areas of health-seeking behaviors. There are few studies on the topic.

Methods

Study population and sampling

The study population comprised all Chinese-speaking Hong Kong residents (approximately 95% of the total population in Hong Kong are ethnic Chinese) [18] who were of age 18 to 60 years old. Telephone numbers were randomly selected from up-to-date residential phone directories. Almost 100% of the Hong Kong residents have telephones at home (Hong Kong Office of the Telecommunications Authority, personal communication, January 28, 2000).

Two telephone surveys were conducted from 6th June 2003 to 10th June 2003 and from 4th to 14th September 2003, using identical methods. The first survey was carried out at the time when the epidemic was ending. It compared frequencies of relevant behaviors practiced then with those practiced during the pre-SARS period. The second survey was conducted about 3 months after the end of the epidemic in Hong Kong. Frequencies of practicing the studied behaviors were measured to assess whether the detected behavioral changes had been sustained within a 3-month period.

Trained interviewers made telephone calls between 6 p.m. to 10:30 p.m. to avoid under-sampling workers and students. Unanswered calls were given at least two more follow-up calls, made at different hours and weekdays, before being classified as invalid. The person who answered the phone was informed that the study topic was related to studying impacts of the SARS epidemic. A household member between the ages of 18–60 years, whose birthday was closest to the date of interviews, was invited to participate in the study. Verbal informed consent was obtained. Ethics approval was obtained from the ethics committee of the Chinese University of Hong Kong.

In the first survey, a total of 3614 telephone numbers were called; 1457 eligible households answered the call

and 1707 numbers were non-contacts. The overall response rate, defined as the number of respondents joining the study ($n = 800$) divided by the number of respondents joining the study ($n = 800$) and refusals ($n = 657$), was approximately 55%. Similarly, 1422 eligible households were contacted for the second survey and the response rate was 56.5% ($n = 803$).

Measurements

Information on the socio-demographic characteristics of the respondents was collected. The frequencies of practicing the following health-seeking behaviors were measured: health service-seeking behaviors, adoption of healthier life-styles, increased resource spending on health, having good personal hygiene, mask-wearing when manifesting influenza-like symptoms, and avoidance of risk behaviors (see Table 2).

In Survey 1, respondents were asked whether they had practiced such behavior more or less frequently at the time of Survey 1, as compared to the pre-SARS period. In both Survey 1 and Survey 2, respondents were also asked how frequently they currently practiced such behaviors. For two items related to the resource expenditures on health, the questions were phrased differently (how much money/time do you spend on health in a month?). The question on whether the respondents worried about their family members contracting SARS or contracting SARS themselves was only asked in Survey 1.

Statistical analysis

Percentages reporting changes in the frequencies of practicing various health-seeking behaviors (more often, the same, and less often) at the time of Survey 1 as compared to pre-SARS period were summarized. Differences were compared by Chi-square test and univariate odds ratios (OR). Multivariate logistic regression analysis was carried out to adjust for demographic variables.

Composite scores were constructed by adding up the responses of individual items belonging to different dimensions of health-seeking behaviors (health service-seeking, 2 items; healthier life style, 7 items; personal hygiene, 3 items). Cronbach alpha values were calculated for such composite scores. The mean of these composite scores for different groups was compared, using analysis of covariance (ANCOVA) method and adjusting for demographic variables.

Results

Background characteristics of respondents

About half of the respondents were male and about 50% of the respondents were of age below 40 years. About 40%

of the respondents had finished secondary school and 30% of the respondents were currently single and about 60% them were employed full time. The differences between the distributions of these background variables of the two surveys were all statistically non-significant ($P > 0.05$, chi-square test) (see Table 1).

Health services-seeking behaviors

About one-fourth (24.1%) of the respondents reported that they sought prompt medical consultation more frequently around the time of Survey 1 (June 2003) when they felt sick, as compared to the pre-SARS period (7.4% reported the reverse). In both Survey 1 and Survey 2, the percentages reported frequently practicing this behavior were close to 90% ($P = 0.903$). Similarly, about 10% mentioned that they complied more often with physicians' advice (such as follow-up visits or medications) at the time of Survey 1, as compared to the pre-SARS period (versus 1% who stated otherwise). The percentages of frequently or very frequently doing so were close to 93% in both Surveys 1 and 2 ($P = 0.73$) (see Table 2). Male respondents were less likely to report an increased frequency of practicing health services-seeking behaviors (Table 3).

Adjusting for the background factors listed in Table 1, the mean difference of the composite scores measured at Survey 1 and Survey 2, formed by summation of the responses of the two above-mentioned items (Cronbach alpha = 0.6289), was not statistically significant ($P = 0.784$).

Table 1
Background characteristics of respondents

	Survey 1 (<i>n</i> = 800)	Survey 2 (<i>n</i> = 803)	All (<i>n</i> = 1603)
Gender	%	%	%
Male	47.5	46.9	47.2
Female	52.5	53.1	52.8
Age group			
18–29	30.7	26.9	28.8
30–39	24.3	21.8	23.0
40–50	25.5	31.3	28.4
50–60	19.5	20.0	19.7
Level of education			
Form 3 or less	24.5	25.8	25.2
Form 4–form 5	34.9	31.1	33.0
Form 6–Form 7	13.1	12.4	12.8
University or above	27.4	30.7	29.1
Marital status			
Currently single	39.8	38.1	39.0
Currently married/cohabitation	59.9	59.4	59.7
Others	0.3	2.5	1.4
Employment status			
Full time	58.5	58.0	58.3
Part time	6.0	6.8	6.4
Student	12.7	10.5	11.6
Retired	2.6	2.6	2.6
Housewife	13.5	17.0	15.3
Unemployed or others	6.6	5.1	5.9

Healthier life styles

About 6% to 13% of the respondents of the Survey 1 stated that they engaged in the following behaviors more frequently at the time of Survey 1 as compared to the pre-SARS period: exercising for at least 1 h per week, weight-control, avoidance of excess sweet or cholesterol-rich food, consumption of health food products, and ensuring enough sleep (Table 2). About 40% and 60% of the respondents, respectively stated that they were currently “frequently/very frequently” practicing such health-seeking behaviors around the time of Survey 1 and Survey 2.

Similarly, of Survey 1 respondents, 10.4% responded that they were more frequently trying to get adequate sleep and 32.7% actively sought health-related information more often at the time of Survey 1 as compared to the pre-SARS period. In Survey 1 and Survey 2, about 78% and 73.5% of the respondents claimed that they had “frequently” or “very frequently” been getting enough sleep ($P = 0.045$).

Female respondents were more likely than male respondents to have reported an increased frequency of practicing healthier lifestyle at Survey 1, as compared to the pre-SARS period (Table 3). In general, age, education, and marital status were non-significant factors.

The difference between the composite score formed by adding up the scores of the 7 above-mentioned items (Cronbach alpha = 0.6218), as measured in Survey 1 and Survey 2, was not of statistical significance ($P = 0.373$).

Willingness to spend more time or money to maintain good health

Over one-third (38.4% and 34%, respectively) of the respondents in Survey 1 were more willing to spend more money or more time to maintain their health (about 1% stated the opposite) at the time of Survey 1 as compared to the pre-SARS period. In Survey 1, 11.2% and 32.6%, respectively were spending at least HK\$500 (about US\$65) or at least 15 h per month for health maintenance. These figures were not statistically significant when compared to those obtained from the second survey (14.1% and 28.8%, $P > 0.05$) (see Table 2).

Female respondents were more likely than male respondents to be willing to spend more money and time on health-related matters. Younger respondents were more likely than older respondents to be willing to spend more time on health matters (Table 3).

Personal hygiene

About 60% to 75% of the respondents of Survey 1 reported that they more frequently kept their home hygienic, maintained good personal hygiene, or frequently/very frequently washed their hands at the time of Survey 1, as compared with the pre-SARS period. The percentage of respondents who reported frequently practicing such hygiene

Table 2
Comparing frequencies of practicing health-seeking behaviors at the time of Survey 1 and during the pre-SARS periods, and at the time of Survey 1 and Survey 2

Health service-seeking behaviors	Comparing frequencies of health-seeking behaviors practiced at time of Survey 1 and at the pre-SARS period ^a			Percent frequently/very frequently practicing health-seeking behaviors			
	More often %	Same %	Less often %	Survey 1 %	Survey 2 %	Univariate OR (Survey 2 vs. Survey 1)	Multivariate OR (Survey 2 vs. Survey 1) ^b
Health service-seeking behaviors							
Seek medical consultation promptly when one felt sick	24.1	68.5	7.4	89.5	88.7	0.991	0.897
Comply with physicians' advices	9.5	89.5	1.0	92.8	93.2	1.004	1.043
Healthier life style							
Exercise for >1 h/week	10.4	86.8	2.9	59.2	58.9	0.995	0.963
Control body weight	6.0	93.4	0.6	56.1	61.0	1.087*	1.206
Avoid consuming too much sweet food	3.6	95.5	0.9	46.5	55.9	1.202**	1.441**
Avoid consuming food rich in cholesterol	4.0	94.9	1.1	52.4	63.1	1.204**	1.510**
Consume health food products	13.4	85.8	0.8	35.6	31.2	0.876	0.810
Getting enough sleep	10.4	85.9	3.6	77.8	73.5	0.945*	0.764*
Actively searching health-related information	32.7	66.9	0.4	43.7	39.6	0.906	0.826
Resources to be spent on health							
Willing to pay more money on health ^c	38.4	64.1	1.1	11.23	14.13	1.259	0.815
Willing to spend more time on health ^d	34.0	64.7	1.3	32.64	28.84	0.883	1.217
Personal hygiene							
Keep the living quarter hygienic	61.0	38.9	0.1	91.0	88.0	0.967	0.705
Maintain good personal hygiene	67.1	32.9	0.0	98.4	96.9	0.985	0.502
Wash hands frequently	75.9	24.1	0.0	94.8	93.9	0.991	0.810
Mask-wearing behavior							
Wear a mask when having cold/flu	72.7	26.4	0.9	74.3	39.1	0.526**	0.216**
Risk behaviors							
Avoid risk behaviors	13.5	85.5	1.0	65.1	74.1	1.138**	1.516**

^a Whether a certain behavior was more often or less often practiced at the time of Survey 1, as compared to the pre-SARS period. Such data were collected only in Survey 1.

^b Odds ratios adjusted for age, education levels, marital status, and employment status.

^c Percent willing to spend HK\$500 or more per month on health.

^d Percent willing to spend 15 h or more per month on health.

* $P < 0.05$.

** $P < 0.001$.

practices was high both in Survey 1 and Survey 2 (over 90%). Percentages of subjects with frequent/very frequent hand-washing behaviors were maintained at high levels (94.8% and 93.9% in Surveys 1 and 2, $P = 0.484$) (see Table 2). Demographic differences are presented in Table 3.

Composite scores were derived from adding up the 3 above-mentioned items ($\alpha = 0.6053$). The mean score obtained from Survey 2 was significantly lower than that of Survey 1 ($P < 0.001$).

Mask-wearing behaviors

In Survey 1, over 70% of the respondents reported that they wore masks more frequently when having influenza-like symptoms at the time of Survey 1, as compared to the pre-SARS period. Very few respondents gave an opposite answer (Table 2). The percentage reporting a high frequency (i.e. "frequently" or "very frequently") of such behaviors was 74.3% in Survey 1, and 39.1% in Survey 2 ($P < 0.001$).

In Survey 1, around 80 to 90% of the respondents stated that they would or certainly would wear a mask in public

venues or at the workplace, if they manifested influenza-like symptoms. The figures dropped to about 60 to 70% in Survey 2 ($P < 0.01$) (see Table 4). About 30–40% of the respondents stated they would definitely wear a mask at home (Table 4).

Female, older, non-single respondents were more likely than others to report an increased frequency of using masks at Survey 1 as compared to the pre-SARS period (Table 3).

Avoidance of risk behaviors

In Survey 1, about 13.5% of the respondents reported that there were more frequent avoidance of risk behaviors such as unsafe sexual behaviors at the time of Survey 1 as compared to the pre-SARS period. The percentages reporting "frequently" or "very frequently" doing so were 65.1% and 74.1%, respectively, in Survey 1 and Survey 2 (Table 2). Married respondents were more likely than single respondents to report an increased frequency of avoiding risk behaviors (Table 3).

Table 3
Demographic differences in percents practicing health-seeking behaviors more often at time of Survey 1, as compared to the pre-SARS period

	Gender			Age					Education					Marital status		
	Male	Female	<i>P</i> ^a	18–29 years	30–39	40–49	50–60	<i>P</i> ^b	≤9 years	10–11	12–13	University	<i>P</i> ^b	Single	Non-single	<i>P</i> ^a
Health service-seeking behaviors																
Seek medical consultation promptly when one felt sick	21.6	26.4	0.109	27.5	26.4	23.6	17.4	0.030	24.2	25.4	26.0	22.1	0.743	25.2	23.5	0.602
Comply with physicians' advices	8.9	10.0	0.597	11.1	11.9	8.4	5.8	0.074	8.8	12.0	7.8	8.3	0.862	10.1	9.2	0.669
Healthier life style																
Exercise for >1 h/week	8.2	12.4	0.050	11.5	13.0	9.4	6.5	0.104	11.3	9.4	13.5	9.7	0.736	11.0	10.0	0.648
Control body weight	3.7	8.1	0.008	4.5	9.3	5.9	4.5	0.952	4.6	8.3	2.9	6.0	0.700	6.3	5.8	0.782
Avoid consuming too much sweet food	3.2	4.0	0.501	2.0	6.2	4.9	1.3	0.869	3.6	4.3	3.8	2.8	0.730	3.1	4.0	0.548
Avoid consuming food rich in cholesterol	3.2	4.8	0.245	2.0	5.7	6.4	1.9	0.436	4.7	5.1	1.9	3.2	0.472	2.8	4.8	0.165
Consume health food products	8.4	18.0	<0.001	11.5	18.7	12.9	11.0	0.895	13.0	12.8	11.5	16.2	0.471	11.7	14.7	0.225
Getting enough sleep	9.5	11.3	0.414	13.6	11.5	9.4	5.8	0.012	8.2	7.7	18.3	12.6	0.060	11.7	9.6	0.334
Actively searching health-related information	28.6	36.5	0.017	29.6	36.5	33.0	32.5	0.518	28.9	33.2	26.9	37.5	0.130	30.7	34.0	0.327
Resources to be spent on health																
Willing to pay more money on health	28.9	40.1	0.001	34.0	32.3	40.4	31.6	0.801	30.4	33.5	36.5	38.2	0.089	33.4	35.6	0.526
Willing to spend more time on health	30.0	37.7	0.022	35.7	42.0	34.5	21.4	0.011	27.5	37.3	30.8	36.9	0.057	35.5	33.0	0.457
Personal hygiene																
Keep the living quarter hygienic	57.6	64.0	0.063	59.4	61.7	64.5	58.7	0.753	59.3	60.5	60.6	62.7	0.510	56.6	64.0	0.037
Maintain good personal hygiene	65.0	69.0	0.224	72.1	72.5	66.0	54.8	0.001	58.8	65.9	68.3	75.1	0.001	69.8	65.4	0.196
Wash hands frequently	73.9	77.8	0.209	72.0	79.8	80.3	71.0	0.614	66.8	76.4	76.9	82.5	<0.001	74.1	77.1	0.328
Mask-wearing behavior																
Wear a mask when having cold/flu	67.9	77.1	0.004	65.2	73.6	79.2	75.5	0.003	68.4	76.8	68.3	72.8	0.372	67.3	76.2	0.006
Risk behaviors																
Avoid risk behaviors	11.7	15.2	0.149	11.2	15.5	14.1	13.7	0.413	13.8	15.6	9.7	12.5	0.568	10.1	15.6	0.027

^a *P* values derived from Pearson Chi-square test.

^b *P* values derived from Chi-square test for trend.

Table 4
Perception on mask-wearing behaviors when respondents had cold/influenza in the coming month

If you have cold/influenza in the coming month,	Male		P value	Female		P value ^a
	Survey 1(%)	Survey 2(%)		Survey 1(%)	Survey 2(%)	
You would wear a mask at home			0.003			0.342
Certainly/likely	38.5	31.3		35.4	32.3	
Unlikely/certainly not	61.5	68.7		64.6	67.6	
You would wear a mask at public places			<0.001			<0.001
Certainly/likely	87.6	69.2		90.7	76.5	
Unlikely/certainly not	12.4	30.8		9.3	23.5	
You would wear a mask at the workplace			<0.001			0.008
Certainly/likely	78.4	63.7		80.8	72.3	
Unlikely/certainly not	21.6	36.3		19.2	27.7	

^a Chi-square test.

Relationships between worrying about contracting SARS and various health-seeking behaviors

The respondents of the Survey 1 were further divided into two groups: Group 1 included those who worried that he/she or his/her family members might contract SARS ($n = 277$) and Group 2 included those who did not have such a worry ($n = 522$). It can be seen that members in Group 1 and Group 2 did not differ in the likelihood of having favorable changes in health services-seeking behaviors, willingness to spend more time for health maintenance, or avoidance of

practicing risk behaviors (Table 5). Other than that, those who worried about SARS infection were much more likely to have claimed favorable changes in all other health-seeking behaviors that are listed in Table 4. The adjusted odds ratios ranged from 1.19 to 2.27 (Table 5).

Composite scores were also calculated by summing the item responses representing the direction and strength of perceived changes in the frequency of health-seeking behaviors between the time of Survey 1 and the pre-SARS period (1 = more often, 0 = the same, -1 = less often): health service-seeking behaviors (2 items, $\alpha = 0.6350$),

Table 5
Relationships between health-seeking behaviors and whether worried about contracting SARS

Health service-seeking behaviors	Percent practicing health-seeking behaviors more often ^a		Odds ratio	
	Group 1 ^b ($n = 277$)%	Group 2 ^b ($n = 522$)%	Univariate OR (Group 1 vs. Group 2)	Multivariate OR ^c (Group 1 vs. Group 2)
Health service-seeking behaviors				
Seek medical consultation promptly when one felt sick	27.4	22.2	1.234	1.393
Comply with physicians' advices	11.6	8.3	1.398	1.482
Healthier life style				
Exercise for > 1 h/week	14.8	8.0	1.850**	2.237***
Control body weight	9.0	4.4	2.045**	2.138*
Avoid consuming too much sweet food	4.3	3.3	1.303	1.306
Avoid consuming food rich in cholesterol	5.8	3.1	1.871	1.833
Consume health food products	18.8	10.6	1.774***	1.956**
Getting enough sleep	13.4	8.9	1.506*	1.658*
Actively searching health-related information	40.1	28.9	1.388***	1.643**
Resources to be spent on health				
Willing to pay more money on health	41.5	31.3	1.326**	1.606**
Willing to spend more time on health	45.1	28.2	1.599***	2.271***
Personal hygiene				
Keep the living quarter hygienic	71.5	55.6	1.286***	1.953***
Maintain good personal hygiene	74.4	63.4	1.174**	1.714**
Wash hands frequently	84.8	71.3	1.189***	2.242***
Mask-wearing behavior				
Wear a mask when having cold/flu	79.7	69.0	1.155**	1.677**
Risk behaviors				
Avoid risk behaviors	15.1	12.5	1.208	1.194

^a Percent practicing a particular health-seeking behavior more often at the time of Survey 1, as compared to the pre-SARS period.

^b Whether respondents worried about themselves and their family members may contract SARS (Group 1 = Yes, Group 2 = No).

^c Multivariate odds ratios adjusted for age, education levels, marital status and employment status.

* $P < 0.05$.

** $P < 0.01$.

*** $P < 0.001$.

healthier life style (7 items, $\alpha = 0.6068$), willingness to spend time/money to maintain health (2 items, $\alpha = 0.5929$), and good personal hygiene (3 items, $\alpha = 0.7132$). Comparison of composite scores of the Group 1 and Group 2 respondents indicated that there was no statistically significant difference for the scale that is related to health service-seeking behaviors, while highly significant differences were observed for the other three composite scores ($P < 0.001$). Those who worried about SARS infection were more likely to have been practicing these health-seeking behaviors more frequently at the time of Survey 1, as compared to the pre-SARS period.

Discussion

It is seen that over 60% of the respondents claimed that they had improved their personal hygiene at the end of the SARS epidemic (i.e. at the time of Survey 1), when compared to the pre-SARS period. Over 90% self-reported that they had been practicing good personal hygiene “frequently” or “very frequently” in Survey 1 and Survey 2. Similar improvements of public health measures in wearing face-masks when having influenza-like symptoms were also observed. These findings were consistent with the sharp increase in the frequency of hand-washing, disinfection of living quarters, and wearing mask demonstrated when survey data from late March compared to mid-May, 2003 [12].

It is also important to note that although the percentages of respondents frequently wearing masks (when having influenza-like symptoms) declined sharply from early June (Survey 1) to early September, 2003 (Survey 2), from 74.3% to 39.1%, percentages of respondents frequently practicing good personal hygiene decreased only slightly and was still maintained at a very high level (around 90% in early September 2003). The Hong Kong Government has been launching continual campaigns to promote personal hygiene and public health.

About 35 to 40% of the respondents stated that they were willing to spend more money and more time to maintain their health. Hong Kong is a highly competitive city and studies have shown that the frequency of doing exercise was very low [19]. Similarly, obesity, sleeping disorders, imbalanced diets, etc. have all been of growing concern [20,21]. Stress levels in Hong Kong have been noted to be high [22], particularly during the economic slump of 2003 [22]. In fact, some health-seeking behaviors were practiced even more frequently at the time around Survey 2, when compared to Survey 1 (such as exercising for at least 1 h per week, weight and diet control). Nonetheless, such frequencies are still far from ideal.

Delayed medical consultation for influenza-like symptoms would increase the chance of transmission to others. An earlier study showed that nearly 70% of the respondents were not seeking medical consultation from physicians when they felt ill with influenza-like symptoms (Lau et al.: unpublished

observation). The results show that SARS may also have changed some of these practices. About 30% of the respondents stated that they were more actively seeking health information, and about 40% or so of the respondents were frequently doing so at the time around Surveys 1 and 2. It is important for health authorities to continuously disseminate health promotion information, even if SARS is not resurging.

A number of theoretical models have been used to predict health-seeking behaviors, such as the Health Belief Model [23], Theory of Reasoned Action [24], and Theory of Planned Action [25]. These models suggested that variables such as perceived efficacy, perceived susceptibility, perceived severity of the disease, perceived benefits, relevant norms and attitudes, behavioral intention, and perceived behavioral control, etc. to be predictive of practicing health-seeking behaviors. SARS was perceived to be severe as 84% of the general population believed that the epidemic was out of control and 51.6% believed that it was fatal [12]. Relevant norms had been formed in that people now believe that mask use signifies civic responsibility [12]. Over 90% of the general public believed that the use of face-masks, frequent hand-washing, and disinfection of living quarters to be efficacious means of SARS prevention. This study also showed that about 34% of the respondents worried that they themselves or their family members might contract SARS. Therefore, it is not surprising to observe an increase in the use of SARS-related preventive behaviors (such as mask use, hand hygiene, and disinfection of living quarters, etc.) when the post-SARS period and the pre-SARS periods were compared. It is, however, interesting to see that such behavioral changes have been sustained for an intermediate period of time (3 months). It is also very interesting to note that changes of health-seeking behaviors have spilled over to other areas that are less directly related to SARS, such as adherence to healthier life styles, compliance to medical advices, and avoidance of risk behaviors, etc. The behavioral changes may be indicative of fundamental changes in health-seeking behaviors.

Furthermore, a number of studies have shown that fear of contracting the disease was associated with preventive behaviors (e.g., increased cancer screening [26]). Fear toward HIV was also associated with condom use [27]. About 73% of the general public in Hong Kong considered SARS to be “horrible” (Lau et al.: unpublished data). Therefore, the findings that those who worried about contracting SARS (themselves or their family members) were more likely to practice health-seeking behaviors are very much in line with the findings reported in the international literature. However, fear may also result in discrimination. The HIV/AIDS campaign therefore had avoided using the “fear approach” (e.g., the “death pyramid” symbol). A balance between the need for prevention and avoidance of possible discrimination is hence required.

In summary, SARS did not only have negative impacts on the community, it also has some positive ones. Those

who worried about contracting SARS showed more favorable changes. These positive public health impacts may be part of the coping responses to the negative ones. Coping behaviors have also been documented in a research studying post-9-11 impacts [28].

The study has a few limitations. Firstly, some telephone numbers are unlisted. In Hong Kong, telephone numbers are listed automatically unless a special request is made. A number of studies have also been published using telephone surveys [12,29,30]. The age and gender distributions of the sample are more or less comparable to those obtained from the census data [31]. Second, the response rate was about 55% and information of non-respondents could not be obtained. The response rate was comparable to many other studies in Hong Kong [12,29]. Thirdly, the responses may be subjected to social desirability bias. However, the study is anonymous and there was some variation in the responses to different questions. For instance, only 10% said that they were exercising more often during the SARS period and only 13.5% said that they were more likely than before to avoid practicing risk behaviors. Fourth, baseline data had not been obtained in the pre-SARS period. The percentages of respondents self-reporting an improvement when self-reported deterioration however showed strong contrasts.

SARS transmission has been an extremely important public health issue. It has redefined the significance of using public health measures to control infectious disease. Its impacts are hence not limited to its clinical morbidity and mortality, or even to its heavy psychological impact. SARS may also have strong and important bearings on the practice of health-seeking behaviors. It is also important to study whether other emerging infectious diseases are having similar impacts on health-seeking practices, and if so, to make use of the opportunities to promote public health of the community. Further research is therefore warranted.

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