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## Compliance by Hong Kong's National Sport Organizations With the WorldISSN: Anti-Doping Program 1543

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Submitted by: Lena Fung - Hong Kong Baptist University; Yvonne Yuan - Hong Kong Sports Institute Limited

### Abstract

The

present study aimed to assess current anti-doping efforts among Hong Kong's national sport organizations (NSOs), for example organizations' readiness to change and to initiate or strengthen anti-doping measures. The points of view of administrators, coaches, and committee members were considered. A great majority of NSOs in Hong Kong appeared to be at the contemplation stage, concerning anti-doping actions. The major constraints they faced were limited funds and manpower.

The World Anti-Doping Program, developed by the World Anti-Doping Agency (WADA), is structured in three levels: a World Anti-Doping Code, international standards, and models of and guidelines for best practices. WADA officials state that one purpose of the World Anti-Doping Program and code is "to ensure harmonized, coordinated, and effective anti-doping programs at the international and national level with regard to detection, deterrence, and prevention of doping" (World Anti-Doping Agency, 2003). We would like to suggest that the program actually can serve two purposes. On the macro level, it can provide various international federations and national anti-doping organizations (NADOs) with a framework for developing anti-doping policies, rules, and regulations. On a micro level, it can guide national sport organizations (NSOs) in carrying out anti-doping functions like educational programming and in adopting appropriate practices to demonstrate compliance with various anti-doping regulations.

The World Anti-Doping Code has been in place for over 5 years, so the roles of international federations and NADOs in promoting and monitoring athletes' anti-doping behaviors should be clear to sport organizations and professionals involved in high-level competition (e.g., World Games, Olympics). Those not involved at that level may be less familiar with arrangements, for instance coaches and administrators of NSOs that have not produced athletes qualifying for high-level competitions. Even NSOs with experience in high-level competition may have second- or third-tier athletes lacking the exposure their elite counterparts have had. Given that NSOs play a significant role in communicating anti-doping information to athletes and explaining their role in anti-doping regulations, the evaluation of NSOs' current practices is important. The present study provided such an evaluation, using a case-study approach to determine the extent of Hong Kong NSOs' compliance with the anti-doping program. Specifically, we aimed to assess whether Hong Kong's NSOs were implementing anti-doping functions, as well as to identify constraints on their full compliance. Although the study involved only Hong Kong organizations, knowledge gained should be applicable in countries with similar anti-doping experience, and the study should thus prove useful to international federations, NADOs, and WADA as they direct resources and efforts.

Since to an extent NSOs are organizations whose anti-doping compliance or noncompliance can be treated as the adoption of one management practice over another, their anti-doping compliance can be modeled as organizational change. We therefore reviewed such models and chose Prochaska's transtheoretical model (TTM) (Prochaska, 2000) to analyze NSO anti-doping functions. The popular TTM was originally developed to explain behavioral change in individuals

Central to the TTM are three theoretical constructs related to change: (a) stages of change, (b) decisional balance, and (c) process of change. Intentional change—whether by an individual or an organization—can occur in stages and so can be seen as a series of movements along a continuum. There are six such movements or stages: *pre-contemplation*, *contemplation*, *preparation*, *action*, *maintenance*, and *termination*. The terminology *process of change*, in contrast, connotes the belief that change is influenced by both overt and covert activities that comprise *experiential processes* and *behavioral processes*. Experiential processes characterize the early-stage transition and include *consciousness raising*, *dramatic relief*, *environmental reevaluation*, *social liberation*, and *self-reevaluation*. Behavioral processes characterize later-stage transition and include *stimulus control*, *helping relationship*, *counter conditioning*, *reinforcement management*, and *self-liberation*.

In sum, the TTM provides an opportunity to understand the temporal ordering of events as an established pattern is changed, which is what we intended to do in terms of the NSOs' implementation of anti-doping functions. It also provides opportunity to explore mechanisms mediating intentional change (e.g., constraints on implementation of anti-doping functions). An additional rationale for adopting the model was its prior successful application in an analysis of family-service agencies (Prochaska, 2000), a study of the implementation of a system of "time-limited therapy" that has notable parallels to the implementation of anti-doping functions.

## Method

### *Design of Questionnaire*

The three versions of the self-report instrument used in the present study were developed with input from three NSOs of different sizes, whose staffs were invited to participate in face-to-face interviews with a member of the research team experienced in anti-doping works. During these interviews, the purpose and procedures of the study were clarified for the NSOs, and items for inclusion in the questionnaire, as well as in a structured interview, were identified. NSOs participating in these preliminary interviews did not participate in the study itself.

### *Collection of Survey Data*

A letter of invitation to participate in the research project and three copies of the final questionnaire were delivered to each NSO in Hong Kong (except the three involved in instrument development). Follow-up telephone calls were made to confirm the organizations' interest in participating. NSOs that volunteered to participate were scheduled for interviews with research team members. Completed questionnaires were collected during or after an interview session.

The three versions of the study questionnaire included one for NSO administrators, one for NSO coaches, and one for NSO committee members. All versions included Part 1 and Part 2; the version for administrators contained an additional three parts. Part 1 of the questionnaire represented a modification of the Readiness to Change Questionnaire (RTCQ) (Rollnick, Heather, Gold, & Hall, 1992). The original RTCQ, designed to study drinking behavior, is a 12-item questionnaire that assigns excessive drinkers to either the *precontemplation*, *contemplation*, or *action* stages (Heather, Gold, & Rollnick, 1991). For the present study, the modified questionnaire assessed each NSO's readiness to increase

its anti-doping efforts. Part 2 of the questionnaire was based on the early interviews with the three NSOs not generating study data. From these interviews, a list of pros and cons of increased anti-doping efforts was developed. Part 2 asked respondents to rate the importance of these pros and cons as influences on the NSO's decisions about increasing or not increasing anti-doping work. Finally, Parts 3, 4, and 5 of the questionnaire were directed to NSO administrators only and collected information about (a) spending on anti-doping works, (b) opinions about anti-doping education programs, and (c) an NSO's demographic information.

#### *Collection of Interview Data*

Two members of the research team conducted structured face-to-face interviews with representatives of NSOs who were either administrators, committee members, or senior coaches. All were familiar with their NSO's anti-doping works. Standard questions were posed initially, with a respondent's answers guiding a series of appropriate follow-up questions.

#### *Results*

A total of 62 invitations were sent to NSOs in Hong Kong to participate in the research project, and 44 NSOs returned completed questionnaires, a response rate of 71%. Interviews were completed with 42 NSOs' representatives, a response rate of 67.7%.

#### *National Sport Organization Demographics*

The participating NSOs' demographics provide a rough idea of the scope of Hong Kong's locally organized sport. Tables 1–4 present the numbers of athletes, of coaches, and of competitions organized by or participated in by our respondents. Most of the NSOs had fewer than 5 full-time and 5 part-time employees. A majority (77.1%) had fewer than 50 athletes active in international events that were endorsed by an international federation. Over half of the surveyed NSOs (60.6%) had 50–200 Level-1 coaches, while about half (57.6% and 51.5%, respectively) had fewer than 31 Level-2 coaches and fewer than 6 Level-3 coaches. About half of the NSOs organized fewer than 10 local competitions per year, and 65% organized 0–1 international event annually. About 63% of the NSOs sent athletes to 1–5 international competitions each year.

Table  
1

*Numbers  
of Employees at Hong Kong's National Sport Organizations, With  
Percentage of All Surveyed NSOs Having Similar Numbers*

Full-time		Part-time		
Count	%	Count	%	
0	2	4.8	20	48.8
1-5	28	66.7	20	48.8
>5	12	28.6	1	2.4
Total	42	100	41	100

Table 2

*Numbers of Athletes Within Hong Kong's National Sport Organizations, By Competitive Event Type, With Percentage of All Surveyed NSOs Having Similar Numbers*

International Event <sup>a</sup>		Other Event	
Count	%	Count	%
0-10	7	20.0	1 3.8
11-50	20	57.1	5 19.2
51-100	4	11.4	9 34.6
101-200	3	8.6	2 7.7
> 200	1	2.9	9 34.6
Total	35	100	26 100

<sup>a</sup>For

purposes of this study, an international event is a competition endorsed by an appropriate international federation.

Table 3

*Numbers  
of Coaches Within Hong Kong's National Sport Organizations (By  
Level), With Percentage of All Surveyed NSOs Having Similar Numbers*

Level 1	Level 2		Level 3					
	Count	%		Count	%		Count	%
0-50	8	24.2	0-10	13	39.4	0	7	21.2
51-100	9	27.3	11-30	6	18.2	1-5	10	30.3
101-200	11	33.3	31-50	3	9.1	6-10	7	21.2
201-300	4	12.1	51-100	5	15.2	11-20	4	12.1
>300	1	3.03	>100	6	18.2	>20	5	15.2
Total	33	100	Total	33	100	Total	33	100

Table 4

*Annual  
Average Number of Competitions Organized By and Participated in By  
NSOs, With Percentage of All Surveyed NSOs Having Similar Numbers*





Average # of Local Competitions Organized	Average # of International Competitions Organized	Average # of International Competitions Participated In						
	Count	%		Count	%	Count	%	
0-5	14	34.1	0	9	22.5	1-2	13	31.7
6-10	10	24.4	1	17	42.5	3-5	13	31.7
11-20	8	19.5	2	6	15	6-10	6	14.6
21-30	1	2.4	3	1	2.5	11-20	6	14.6
>30	8	19.5	>3	7	17.5	>20	3	7.3
Total	41	100	Total	40	100	Total	41	100

*Resources  
Used for Anti-Doping Efforts*

Our data suggest that Hong Kong's national sport organizations have not invested much, either in terms of finances or manpower, in anti-doping efforts (Table 5). A majority of our respondents—close to 88%—had expended no funds for anti-doping efforts within the 3 years preceding the study and anticipated no such spending throughout the current year. Moreover, 80%–90% of the NSOs had neither any staff members nor honorary consultants assigned to anti-doping work.

Table 5

*Average  
Annual Spending on Anti-Doping Efforts by Hong Kong NSOs, Over 4-Year  
Period, in United States Dollars, With Percentage of All Surveyed  
NSOs Spending Similar Amounts*

	Average Annual Spending in 3 Years Preceding Study	Anticipated Spending During Current Year
0 USD	36 (87.8%)	37 (88.1%)
1–1,000 USD	3 (7.3%)	2 (4.8%)
1,001–2,000 USD	1 (2.4%)	2 (4.8%)
> 2,000 USD	1 (2.4%)	1 (2.4%)

Tables 6

*NSOs' Staffing for Anti-Doping Efforts, By Paid Status and Position, With Percentage of All Surveyed NSOs Providing Similar Numbers of Staff*

Paid Staff

	Count	%
0	35	85.4
1	5	12.2
2	1	2.4

Honorary  
Consultant from Medical Profession

	Count	%
0	32	80
1	3	7.5
2	2	5
>2	3	7.5

Honorary  
Consultant from Legal Profession

	Count	%
0	36	90
1	2	5
2	2	5

Honorary  
Consultant from Technical Field (e.g., Doping Control Officer)

	Count	%
0	33	82.5
1	2	5
2	3	7.5
>2	2	5

Honorary  
Consultant (Unspecified)

	Count	%
0	38	95
4	1	2.5
6	1	2.5

*Opinions  
About Anti-Doping Education Programs*

The NSO respondents were asked their opinions or perceptions concerning appropriate content for inclusion in anti-doping educational programs or informational materials (Table 7). The three

most important content areas, according to our respondents, were “ways to avoid inadvertent doping,” “rights and responsibilities of athletes in doping control,” and “anti-doping rules and regulations.”

Table 7

*NSO  
Respondents' Rank Ordering of Importance of Content Areas in  
Anti-Doping Educational Programs, From Most to Least Important*

Content	Score	
Mean	<i>SD</i>	
Ways to avoid inadvertent doping	.97	1.09
Rights and responsibilities of athletes in doping control	.95	1.17
Anti-doping rules and regulations	.77	1.02
Responsibilities of NSO in doping control	.56	.93
Competitive sports and ethics	.47	.69
Therapeutic use exemption for prohibited drugs	.45	.92
Drug testing procedures	.40	.80
Current international anti-doping practices	.39	.84
Whereabouts information of athletes	.35	.87
Current Hong Kong anti-doping practices	.34	.72

As shown in Table 8, the surveyed respondents indicated that the most suitable medium to deliver anti-doping educational programs was a web page. Workshops, pamphlets, and video presentations were also considered suitable modes of delivery.

Table 8

	Mean	SD
Web page	2.77	2.02
Workshop	2.58	2.12
Pamphlet	2.15	1.79
VCD	2.13	1.73
Other	.35	1.03

Surveyed  
NSO associates suggested other suitable media for providing  
anti-doping education (Table 9), as well.

Table 9



Mode	Number of Respondents Making This Suggestion
TV Commercial/Program	3
Seminar	1
Newspaper Article	1
Commercial Media	1
Exhibition	1

Respondents were asked what they thought would be a suitable time to conduct an anti-doping workshop; opinions varied from NSO to NSO. As shown in Table 10, while 45% preferred weekday evenings, other times also had support (i.e., weekday "office hours," 30%; weekends, 25%).

Table 10

	Frequency	%
Monday–Friday “Office Hours”	12	30
Monday–Friday Evenings	18	45
Saturday–Sunday	10	25
Total	40	100

Asked if they would recommend that their NSO staff attend a 6–8-hr anti-doping workshop costing \$300 HKD (about \$40 U. S.) per participant, 68.3% of our respondents said yes (Table 11).

Table 11

*Number/Percentage of Respondents Who Would/Would Not Recommend NSO Staff Attendance at 6–8-Hr, 300 HKD Anti-Doping Workshop*

	Frequency	%
Yes	28	68.3
No	13	31.7
Total	41	100

*Readiness  
for change*

Data from the modified RTCQ completed by NSO administrators, coaches, and committee members are presented in Table 12. A majority of respondents of all three types were in the contemplation stage (54.5% of administrators, 51.1% of coaches, and 47.7% of committee members). Being in the contemplation stage meant actively considering whether to initiate or strengthen an NSO's anti-doping effort.

Table 12

*Indicated  
Readiness to Initiate or Strengthen NSO's Anti-Doping Efforts, In  
Terms of RTCQ "Stage," With Percentage of All Respondents at Same  
"Stage"*

	Precontemplation	Contemplation	Action
Administrators	8 (18.2%)	24 (54.5%)	14 (27.3%)
Coaches	8 (17.8%)	23 (51.1%)	14 (31.1%)
Committee Members	10 (22.7%)	21 (47.7%)	13 (29.5%)

*Factors in  
Decision Making About Anti-Doping Efforts*

Administrators, coaches, and committee members were asked to rate the importance of a list of pros and cons of initiating or strengthening anti-doping efforts within their NSO (Tables 13 and 14).

Table  
13

*NSO  
Respondents' Rank Ordering of Importance of "Pro" Factors in  
Anti-Doping Decisions, From Most to Least Important*

Pros	Score
Average	<i>SD</i>

Administrators

It will directly or indirectly improve professional knowledge of the NSO staff.	5.1	1.17
It will help us to avoid being penalized by an international federation.	3.85	1.61
It will affect the professional image of the NSO.	3.69	1.49
It will help to preserve the health of our athletes.	3.17	1.38
There is a need to comply with the rules and regulations set forth by the international sporting community.	2.06	1.17
It will help to maintain fair play.	2.06	1.21

Coaches

It will directly or indirectly improve professional knowledge of the NSO staff.	4.11	1.41
It will help us to avoid being penalized by an international federation.	3.93	1.67
It will affect the professional image of the NSO.	3.7	1.66
There is a need to comply with the rules and regulations set forth by the international sporting community.	2.93	1.6
It will help to preserve the health of our athletes.	2.7	1.6
It will help to maintain fair play.	2.41	1.54

Committee members

It will directly or indirectly improve professional knowledge of the NSO staff.	4.85	1.24
It will help us to avoid being penalized by an international federation.	4.1	1.62
It will affect the professional image of the NSO.	3.94	1.6
It will help to preserve the health of our athletes.	2.73	1.58
There is a need to comply with the rules and regulations set forth by the international sporting community	2.45	1.11
It will help to maintain fair play.	2.24	1.28

Table  
14

*NSO  
Respondents' Rank Ordering of Importance of "Con" Factors in  
Anti-Doping Decisions, From Most to Least Important*

Cons	Score
Average	SD

Administrators

It will create unnecessary hassle for our athletes.	4.98	1.23
It will pose additional financial pressure on our NSO.	3.81	1.46
Anti-doping work is not essential to the development of our NSO.	3.36	1.55
Athletes in our sport do not use prohibited substances to enhance performance.	3.12	1.66
There is a lack of professional knowledge to implement such works.	3.07	1.51
There is a lack of manpower to implement such works.	2.44	1.38

Coaches



It will create unnecessary hassle for our athletes.	4.56	1.28
Anti-doping work is not essential to the development of our NSO.	3.78	1.41
It will pose additional financial pressure on our NSO.	3.6	1.55
Athletes in our sport do not use prohibited substances to enhance performance.	3.58	1.76
There is a lack of professional knowledge to implement such works.	3.06	1.63
There is a lack of manpower to implement such works.	2.76	1.21

Committee  
Members

It will create unnecessary hassle for our athletes. 4.92 1.41

Anti-doping work is not essential to the development of our NSO. 3.92 1.68

It will pose additional financial pressure on our NSO. 3.85

Athletes in our sport do not use prohibited substances to enhance performance. 3.27 1.71

There is a lack of professional knowledge to implement such works. 3.52 1.69

There is a lack of manpower to implement such works. 2.85 1.66

For the list of “pros” associated with initiating or strengthening an anti-doping effort, administrators, coaches, and committee members alike said the three most important considerations were, in descending order of importance, “It will directly or indirectly improve professional knowledge of the NSO staff,” “It will help us to avoid being penalized by an international federation,” and “It will affect the professional image of the NSO.” Similarly, for the list of “cons,” they agreed that the most important consideration was “It will create unnecessary hassle for our athletes,” and that the second and third most important factors were “Anti-doping work is not essential to the development of our NSO” and “It will pose additional financial pressure on our NSO,” respectively. However, administrators said financial pressure was a more important consideration than coaches and committee members said it was, while the latter groups felt more influenced than administrators did by anti-doping’s perceived nonessential role in the development of an NSO.

*NSOs’  
Present and Upcoming Anti-Doping Efforts*

The interviews we conducted with representatives of Hong Kong’s NSOs allowed for collection of information about their current and

upcoming anti-doping activities, including work in education, capacity building, drug testing, cooperation with international federations and anti-doping organizations, and policy. Results obtained are presented in Table 15.

Table  
15

*NSOs’  
Present and Upcoming Anti-Doping Work, By Activity, With Percentage  
of All Surveyed NSOs Pursuing Same*

Activity	Status <sup>a</sup>	Count	%
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Education

To remind athletes and athlete support personnel that they are bound by the anti-doping rules	1	7	16.3
2	1	2.3	
4	35	81.4	
Total	43	100	
To distribute information on doping control from third parties to your athletes and athlete support personnel	1	14	32.6
2	1	2.3	

4	28	65.1
Total	43	100
To distribute information about education programs on doping control to athletes/coaches/sport administrators	1	18 41.9
4	25	58.1
Total	43	100
To include information on doping control in newsletter, web page, or correspondence with NSO members	1	30 69.8
2	5	11.6
4	8	18.6
Total	43	100
To seek assistance from relevant parties to organize education or information sessions for your athletes and athlete support personnel, on matters related to doping control	1	28 65.1
2	8	18.6
3	2	4.7
4	5	11.6
Total	43	100
To organize educational talk or seminar for your athletes/coaches/sport administrators on anti-doping	1	35 81.4
2	5	11.6

4

3 7

Total

43 100

Capacity Building

To upgrade the existing staff on doping issues, through information/education program	1	32	74.4
2	5	11.6	
4	6	14	
Total	43	100	
To train a doping control officer for your NSO	1	38	88.4
2	3	7	
4	2	4.7	
Total	43	100	

Drug Testing (and Related Functions)







To conduct drug tests for locally held international event	1	23	53.5
2	4	9.3	
4	16	37.2	
Total	43	100	
To conduct drug tests for local competition	1	39	90.7
2	1	2.3	
4	3	7	
Total	43	100	
To conduct out-of-competition drug tests on your athletes	1	41	95.3
2	1	2.3	
4	1	2.3	
Total	43	100	
To keep record of all drug tests conducted on your athletes (for international competition and out-of-competition)	1	26	60.5
2	3	7	
3	1	2.3	
4	13	30.2	
Total	43	100	

To regularly update your international federation(s) and anti-doping organizations on the drug test record and results of your athletes	1	36	83.7
2	1	2.3	
4	6	14	
Total	43	100	
To collect or coordinate the whereabouts information of your athletes	1	24	55.8
4	19	44.2	
Total	43	100	
To regularly update your international federation(s) and anti-doping organizations on the whereabouts information of your athletes	1	30	69.8
4	13	30.2	
Total	43	100	
To assist athletes in the application of the therapeutic use exemption (TUE)	1	34	79.1
2	1	2.3	
4	8	18.6	
Total	43	100	
To keep records of TUE for your athletes	1	35	81.4
2	1	2.3	

4	7	16.3	
Total	43	100	
To regularly update your international federation(s) and anti-doping organizations on the TUE status of your athletes	1	39	90.7
2	1	2.3	
4	3	7	
Total	43	100	

Cooperation  
with International Federations and Anti-Doping Organizations

To assist international federation(s) and anti-doping organizations in conducting drug tests	1	35	81.4
4	8	18.6	
Total	43	100	

Policy

To discuss doping issues in meetings of your NSO	1	25	58.1
2	1	2.3	
4	17	39.5	
Total	43	100	
To include a clause forbidding use of prohibited substances by athletes in the constitution of your NSO	1	26	60.5
2	5	11.6	

4	12	27.9
Total	43	100
To prepare a procedural guideline to handle anti-doping duties (If such a guideline exists, please provide details on the target group and contents.)	1	33 76.7
2	7	16.3
4	3	7
Total	43	100

<sup>a</sup>A numeral 1 in this column indicates an NSO does not intend to pursue the activity in the foreseeable future; a 2 indicates that an NSO is seriously considering action within 6 months (i.e., in the foreseeable future); a 3 indicates that an NSO has developed a plan to act; and a 4 indicates that the NSO has a system in place and pursues the activity.

In terms of education, most NSOs (81.4%) had reminded their athletes and athlete support personnel that they are bound by anti-doping rules. Answers to our follow-up questions suggested that most of the reminders were sent prior to major competitions. The majority of Hong Kong NSOs would distribute to relevant persons information on doping control obtained from third parties (65.1%) and related educational programs (58.1%). However, only 18.6% of the NSOs had included anti-doping information in a newsletter, a web page, or correspondence with its members. To organize educational programs, with or without assistance from third parties, was uncommon among the local NSOs. Programs to enhance an NSO staff's anti-doping knowledge were also relatively undeveloped. Only 14% of NSOs had organized educational programs to upgrade such knowledge, and only 4.7% had a trained doping control officer of their own.

On issues of drug testing and related functions, 37.2% of the NSOs reported they had experience conducting drug tests at locally held international events. However, only 7% had conducted drug tests for local competitions and 2.3% had conducted out-of-competition tests on athletes. It seems that in Hong Kong only athletes competing at the international level are monitored via drug testing. Athletes in local competitions have minimal exposure to drug testing.

In terms of record keeping, about 30.2% of NSOs had records of drug tests conducted on their athletes, but only 14% reported this information to an international federation (most federations made no requests for the information). About half of the NSOs (44.2%) had experience collecting or coordinating whereabouts information for athletes. Only 30.2%, however, updated an international federation regularly about such information (follow-up questions suggested that international federations did not request regular updates, especially from NSOs without athletes competing internationally). Only 18.6% of NSOs had experience applying the therapeutic use exemption with their athletes; 16.3% kept records on TUE and 7% regularly updated an international federation concerning athletes' TUE status.

Only 8% of NSOs had assisted an international federation or anti-doping agency in conducting drug testing. Responses to follow-up questions suggested that both in-competition testing and out-of-competition testing were involved. In terms of policy, 39.5%

of NSOs had discussed doping issues in their meetings. About one third (27.9%) had included a clause prohibiting the use of specified substances by athletes affiliated with them. Response to follow-up questions indicated that most NSOs addressed the issue only indirectly, asking individuals to refer to rules and regulations set forth by international federations. Among the respondents, only 7% had a procedural guideline for handling anti-doping duties.

## Discussion and Recommendations

The main purpose of the survey was to evaluate the anti-doping functions of Hong Kong's NSOs. Data from a questionnaire and interview suggest that the majority of NSOs in Hong Kong were at the contemplation stage in terms of the implementation of anti-doping functions. According to Prochaska's transtheoretical model, individuals at the contemplation stage have started to acknowledge a target behavior, but they may not be ready to make any change (Prochaska, 2000). Moreover, if pressured about the behavior, individuals in the contemplation stage can be very resistant to change. In the case of Hong Kong's NSOs in the contemplation stage, educational workshops and realistic support with resources are essential to moving them to the next stage, which is the action stage.

Studies of TTM suggest that "stage-matched interventions" outperform "action-oriented interventions" (Prochaska et al., 2001); the former can increase the likelihood of progress to the next stage, action. For organizational change, TTM dictates that interventions should be individualized and matched to employees' readiness to change. This would be a necessary consideration during development of anti-doping workshops' content.

According to Prochaska et al. (2001), dramatic relief, self-reevaluation, and thinking about commitment are processes of changes that should be emphasized with those in the pre-contemplation and contemplation stages. The Hong Kong NSOs can, then, be moved to change their anti-doping functions through the use of emotional arousal components, for example discussion of fears of sanctioning by an international federation if noncompliance persists, or discussion of advantages of successfully implementing the anti-doping code. A reevaluation of the NSO's strengths and weaknesses pertaining to implementation can be helpful. NSOs should also be encouraged to discuss the possibility of implementing anti-doping programs and to make a commitment to further anti-doping efforts.

The present study found that resources are the major constraint on implementation of anti-doping functions by the Hong Kong NSOs. To provide the needed additional funds and manpower most cost-effectively, a centralized body could be established to coordinate anti-doping functions, rather than providing funds to underwrite various NSOs' individual efforts.

The present study is the first to study the status of anti-doping efforts among Hong Kong's national sport organizations. Apart from investigating what anti-doping functions the NSOs are currently fulfilling, we also measured their—the administrators', coaches', and committee members'—readiness to change by starting or strengthening anti-doping efforts. It appears that a majority of NSOs in Hong Kong are in the contemplation stage of implementing anti-doping functions and facing the constraints of limited funding and manpower. These data provide a starting point for the design of assistance to the NSOs as they initiate or strengthen anti-doping efforts to comply with the World Anti-Doping Code. Results are likely relevant, as well, in countries with similar anti-doping experience. They should thus be of use to international federations, national anti-doping organizations, and the World Anti-Doping Agency, in terms of directing effort and resources.

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## Author Note

Lena Fung, Hong Kong Baptist University; Yvonne Yuan, Hong Kong Sports Institute Limited.

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