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*EXECUTIVE MASTERS IN SPORTS ORGANISATION MANAGEMENT*



**MEMOS XXIV  
2021-2022**

**Anti-Doping Perceptions of  
the Elite Athletes in Hong Kong**

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## **Acknowledgement**

First of all, I would like to take this opportunity to express my gratitude to Mr. Ronnie WONG, the Honorary Secretary General of the Sports Federation & Olympic Committee of Hong Kong, China (SF&OC); Mr. Abraham CHENG, the Chief Executive of SF&OC; and Mr. Humphreys TANG, the Head of Hong Kong Anti-Doping Committee for nominating me to participate in the Executive Masters in Sports Organisations Management (MEMOS) XXIV and for their continuous support along the journey. I am always grateful for this opportunity to represent SF&OC in MEMOS XXIV.

Secondly, I would like to extend my gratitude to my tutor, Professor Jean-Loup Chappelet, University of Lausanne, for his guidance and advice to lead me preparing this final project throughout the MEMOS year. His valuable comments and suggestions not only help to develop my project, but also inspired and motivated me to achieve my goal.

I would also like to thank all the MEMOS lecturers, the jury and my fellow classmates for all their contributions and experience sharing during the sessions to make MEMOS XXIV a special and incredible year despite the COVID-19 pandemic. Special thanks to Professor Benoit Séguin for arranging all the online and in-person sessions of this special MEMOS year.

Lastly, I would like to thank all the Hong Kong elite athletes who participated in the survey for their time and sharing with me their anti-doping perceptions.

## **Abstract**

The World Anti-Doping Agency published the International Standard of Education in 2021 to emphasize the importance of anti-doping education as a preventive tool to fight for clean athletes. One of the criteria of developing an education plan is to understand stakeholders' perceptions of anti-doping. This study aims to investigate how the elite athletes in Hong Kong perceive anti-doping and the factors that may affect their behaviors. An online survey of 124 elite athletes in Hong Kong was conducted in 2022. The theoretical factors in the Sport Drug Control Model were adapted to measure athletes' attitudes towards doping. Results show that the elite athletes in Hong Kong were generally against doping and had strong ethical beliefs that they would not engage in using performance enhancing drugs. The majority of athletes agreed that they fully understood the anti-doping rules and regulations in Hong Kong and the consequences and sanctions were punitive enough to discourage them from doping. However, there was still a small number of athletes would change their mind to make unethical decisions due to factors of personal morality and reference groups. Most of the athletes would go to their coaches, doctors or teammates if they had any questions regarding anti-doping and education talks were the most effective way, followed by online learning platform for the athletes to improve their anti-doping knowledge. The results indicate a need for the Anti-Doping Organization of Hong Kong, China to include morality elements in the education programs and there is a need to implement anti-doping education for coaches since the athletes rely on them the most when anti-doping matters arise.

## Résumé

L'Agence mondiale antidopage a publié le Standard international d'éducation en 2021 afin de souligner l'importance de l'éducation antidopage en tant qu'outil de prévention pour lutter pour des sportifs propres. L'un des critères d'élaboration d'un plan d'éducation est de comprendre la perception de l'antidopage par les parties prenantes. Cette étude a pour but d'examiner comment les athlètes d'élite de Hong Kong perçoivent l'antidopage et les facteurs qui peuvent affecter leurs comportements. Une enquête en ligne a été menée auprès de 124 athlètes d'élite à Hong Kong en 2022. Les facteurs théoriques du modèle de contrôle des drogues dans le sport ont été adaptés pour mesurer les attitudes des athlètes vis-à-vis du dopage. Les résultats montrent que les athlètes d'élite de Hong Kong étaient généralement contre le dopage et avaient de fortes convictions éthiques selon lesquelles ils ne s'engageraient pas dans l'utilisation de médicaments améliorant les performances. La majorité des athlètes ont reconnu qu'ils comprenaient parfaitement les règles et règlements antidopage en vigueur à Hong Kong et que les conséquences et les sanctions étaient suffisamment punitives pour les dissuader de se doper. Cependant, un petit nombre d'athlètes changeait d'avis et prenait des décisions contraires à l'éthique en raison de facteurs liés à la moralité personnelle et aux groupes de référence. La plupart des sportifs s'adressent à leurs entraîneurs, à leurs médecins ou à leurs coéquipiers s'ils ont des questions concernant la lutte contre le dopage. Les résultats indiquent que l'organisation antidopage de Hong Kong, en Chine, doit inclure des éléments de moralité dans les programmes d'éducation et qu'il est nécessaire de mettre en œuvre une éducation antidopage pour les entraîneurs, car les athlètes comptent le plus sur eux lorsque des questions relatives à l'antidopage se posent.

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## **1. Introduction**

The Anti-Doping Organization of Hong Kong, China (ADOHK) (formerly known as the Hong Kong Anti-Doping Committee) is the National Anti-Doping Organization (NADO) in Hong Kong and has become the signatory of the World Anti-Doping Agency (WADA) since 2009. ADOHK's mission is to preserve a doping-free environment for fair play in sport in Hong Kong and to ensure Hong Kong's Anti-Doping Rules are in full compliance with the World Anti-Doping Code (the Code) and the relevant International Standards. The works of ADOHK mainly focus on educating the elite athletes on anti-doping rules as a preventive tool and conducting doping tests on them as deterrent measures to fight against doping.

One of the strategic priorities of the WADA Strategic Plan 2020 – 2024 is to be Athlete-Centered with some of the key initiatives to tap into data about athletes and their entourage to detect patterns and predict behaviors in order to provide better programs, and the identify vulnerable athletes group to recommend appropriate interventions. WADA has also introduced the Social Science Research Strategy (2020 – 2024) with the goal to increase understanding of the behaviors, psychosocial factors and perceived social norms to be reinforced and prevented, in order to improve the anti-doping community's capability to develop more effective programs. The new International Standard of Education (ISE) was published in 2021 with the purpose to support the preservation of the spirit of sport and to help foster a clean sport environment. The underpinning principle of ISE is that an Athlete's first experience with anti-doping should be through Education rather than Doping Control. In the Education Professional Standard, WADA suggested the educators should gather and review information relevant to potential Anti-Doping Rule Violation (ADRV) by having sufficient knowledge and understanding of stakeholders' perceptions of anti-doping as one of the first criteria to develop a clean sport education plan.

ADOHK is solely responsible for the anti-doping education for the sports community in Hong Kong. The ADOHK's Education Pool has been established according to the ISE in 2021 with the ADOHK Testing Pools athletes who are also the elite athletes receiving the Elite Training Grant (ETG) from the Hong Kong Sports Institute (HKSI), the government's designated organisation to provide the high performance training

system for eligible sports in Hong Kong, as the primary target group of the Education Pool. Although WADA has provided the ISE and guidelines for NADOs to follow and develop their education programs, it is believed that because of the differences in cultural and social factors in different countries that may influence athletes' behaviors and attitudes towards doping, it is necessary to build a customized education program to best fit the athletes in the country or city. Since no research was done on the athletes in Hong Kong related to anti-doping before, there is a need to find out the anti-doping perceptions of the athletes in Hong Kong and the factors that may affect their behaviors, in order to develop a more relevant and effective education program in Hong Kong.

This study focuses on the anti-doping perceptions of the elite athletes, who are also included in the ADOHK Testing Pools, in Hong Kong to gain insights and understanding of the athletes' attitudes towards the use of PES. Based on this objective, the following research questions have been developed:

1. How do the elite athletes perceive doping in sport?
2. How do the elite athletes perceive the doping situation in Hong Kong?
3. How do the elite athletes see the anti-doping system in Hong Kong?
4. What factor(s) will affect the elite athletes' behaviors and attitudes towards the use of performance enhancing substance (PES)?
5. Who do the elite athletes trust most in terms of any anti-doping matters?

By finding out the answers and understanding of the athletes' perceptions, this study aims to build ADOHK's capability to develop and shape the education programs by filling the gaps between the existing programs and any neglected factors that influence their behaviors, in order to develop awareness and foster anti-doping attitudes in Hong Kong.

## **2. Literature Review**

WADA defines doping as fundamentally contrary to the spirit of sport (The World Anti-Doping Code, 2021, p. 13). Spirit of sport is a set of intrinsic value of sport which aligns with the core values of Olympism, namely Excellence, Respect and Friendship (The Fundamentals of Olympic Values Education, 2016, p. 17). Everyone participates in

sport is expected to respect the integrity of sport and compete as a clean athlete. Therefore, athletes' perceptions on anti-doping will affect their attitudes towards the spirit of sport and how fair they play their sports. It is mandatory for the signatories to follow the ISE and develop anti-doping education programs which will place a positive and long-term influence on the choices made by Athletes and other Persons. It emphasizes the importance of values-based education to instill the spirit of sport and foster a clean sport environment. ISE clearly shows that it is important for the anti-doping organizations to first educate the athletes to develop one's personal values and principles so they can act and make the right decisions ethically.

ADOHK has been conducting anti-doping education talks and outreach programs to the elite athletes in Hong Kong since its establishment in 2009. Due to the limited resources, the education programs of ADOHK can only focus on the elite athletes who are included in the ADOHK's testing pools. These education talks are mainly information provision as defined in the ISE which provides accurate and up to date content related to clean sport (International Standard of Education, 2021, p. 10), such as the anti-doping rules violations, doping control procedures, etc. However, there has been no research or study on athletes' perceptions of anti-doping in Hong Kong, except for one study which was on the attitude toward performance enhancement drugs among community coaches in Hong Kong (Fung, L., 2006) can be found. It will be beneficial to ADOHK to find out the attitudes and beliefs of the elite athletes in Hong Kong towards anti-doping, in order to better utilise its resources to plan for the education program more effectively.

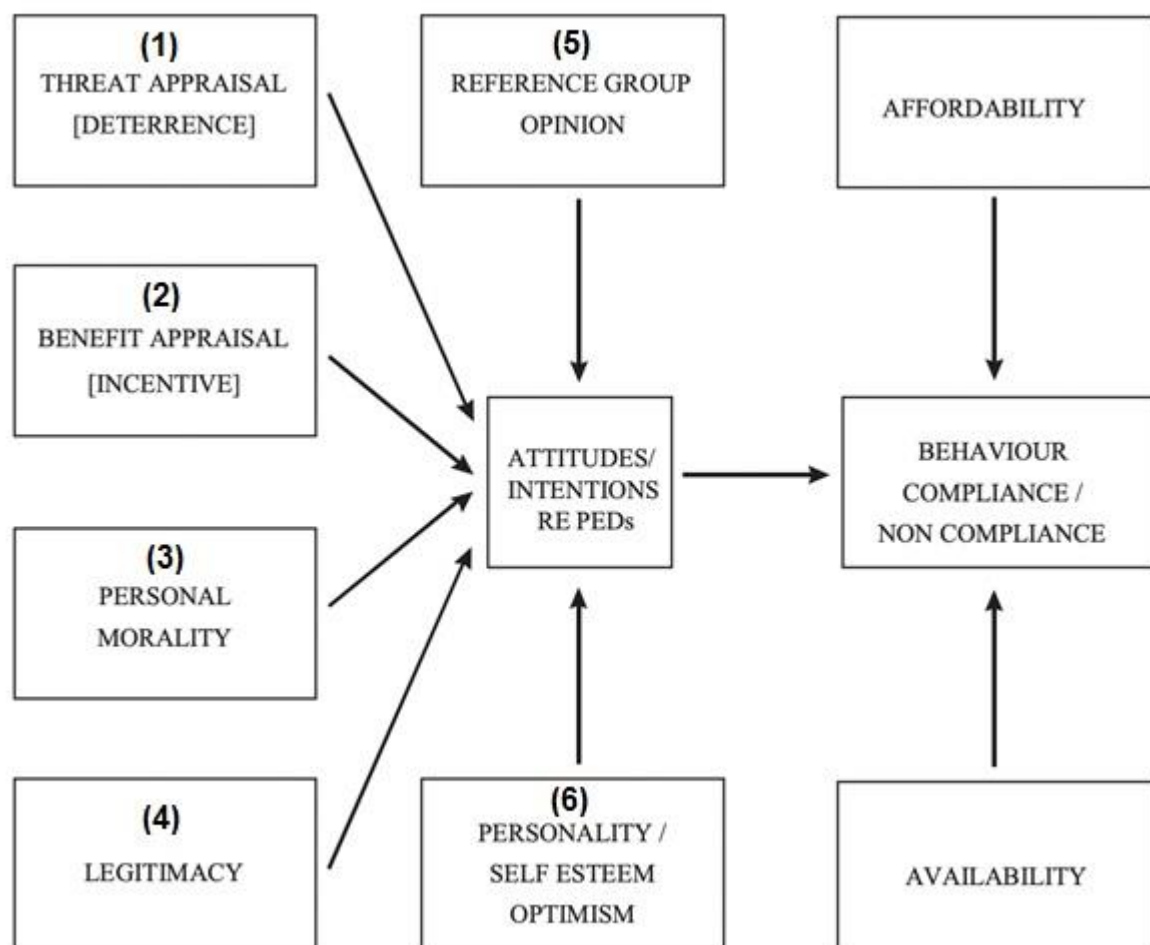
Although there is no study about the athletes' perception of anti-doping in Hong Kong, there are some studies using different approaches and models to find out the attitudes, beliefs and behaviours of athletes, coaches and the public of other countries towards doping in sports.

## 2.1. The Sport Drug Control Model (SDCM)

It is believed that there is a connection between perceptions and behaviors (Dijksterhuis, A., & Bargh, J. A., 2001). By knowing the factors that influence athletes' perception of anti-doping will help to understand their attitudes and behaviors towards

the use of performance enhancing drugs. Donovan, R. J., Egger, G, & Kapernick V (2002) developed the Sport Drug Control Model (SDCM) in Figure 1 to show the comprehensive components which influence the attitudes towards PES use. In the model, there are six key factors that can affect athletes' attitudes towards PES use, namely: (1) threat appraisal; (2) benefit appraisal; (3) personal morality; (4) legitimacy; (5) reference group opinion; and (6) personality. In addition to these six factors, Donovan et al. believed there are two other factors: affordability and availability can also facilitate the intention of using PES.

Figure 1. The Sport Drug Control Model



Jalleh, G., Donovan, R. J., & Jobling, I., (2013) used the SDCM to find out which was the most influential factor to the elite Australian athletes' attitude towards PES use. The study shows that personal morality had the largest effect on athletes' attitudes which means athletes with a weaker moral stance against PES use will be more likely

to use PES. Besides personal morality, perceived reference group opinion and the legitimacy also have significant relationship between the attitudes towards PES use among the elite athletes in Australia.

Another study investigating the attitudes, beliefs and behaviours of elite Singapore athletes towards doping also used the SDCM (Mukherjee, S, 2017). Singapore and Hong Kong are considered to have a similar sports structure and system, as well as doping is not major issue in both places. Since there is no study on the athletes' perception of anti-doping in Hong Kong, the study of the elite Singapore athletes can provide some insights of the athletes' attitude towards doping with similar sports system. Mukherjee, S (2017) found out in his study that the elite Singapore athletes had negative attitude towards doping in general yet there was a considerable number of athletes would think about using PES if it was beneficial to performance and not detectable. The athletes also claimed that they were unaware of the legitimacy of the anti-doping policy in Singapore.

In both studies mentioned above, the results suggested that the education programs to the elite athletes should consider including the factors of personal morality and legitimacy in order to influence their attitudes towards doping. It is common for the anti-doping signatories when planning for the education programs, to only focus on keeping abreast of the latest anti-doping rules and regulations to the elite athletes and ignore the facts that there are some significant factors that will actually influence their perceptions and behaviors. The SDCM helps to identify these factors and to see the different relationships of the factors and perceptions among athletes in different countries.

## 2.2. The Psychosociological Approach

Other than using the SDCM to investigate the athletes' attitudes towards PES use, there are studies using the psychosociological approach to identify the doping intentions among young elite cyclists and adolescent athletes in Switzerland and China respectively. (Lentillon-Kaestner, V., Carstairs, C., 2008; Guo, L., Liang, W., Baker, J. S., & Mao, Z. X., 2021). In Lentillon-Kaestner & Carstairs's study on the young elite cyclists in Switzerland, they found out that the social environment was an

important factor in the use of PES among the cyclists. Although the social pressure to the cyclists at non-professional level helps preventing them to use PES, the findings of cyclists at the professional level showed the opposite that they in fact had pressure from their entourages to start doping. It is understanding that the influence of social pressure could be varied among different sports as well as different level of athletes.

Guo, et al.'s (2021) study on the Chinese adolescent athletes from Beijing shows the effect of moral disengagement and sportspersonship on their intention to dope. Athletes in ego-involving motivational climates, in which they define success as winning and outperform other competitors (Allen, J., Taylor, J., Dimeo, P., Dixon, S., & Robinson, L., 2015), tend to have a higher intention of doping because of moral disengagement. It showed a similar result as using the SDCM that personal morality is one of the significant factors affecting the behaviors towards doping of athletes with different levels.

### 2.3. Coaches and their influences

The above-mentioned studies using different models and approaches pointed out that the influence of reference groups on athletes' attitudes towards doping is noteworthy. The reference groups which the athletes refer to when considering the PES use are mainly the primary contact group such as coaches, family members, other athletes including teammates and opponents, medical staff, etc. Among all these people who can affect athletes' perception, coaches were considered to play the most important role in influencing the athletes by shaping their psychological experiences and behaviors (Ntoumanis, N., Barkoukis, V., Gucciardi, D. F., Chan, K. C., 2017). Previous studies on coaches' interpersonal style (Ntoumanis et al., 2017) and coaching style in China (Chen, Z., Wang, D., Wang, K., & Huang, T., 2017) showed a significant effect on athletes' attitudes towards doping.

Self-determination Theory (SDT) (Deci, E.L., & Ryan, R.M., 2002) has been widely used by many researchers to study the effects of different coaching styles on athlete motivation, psychological well-being and behavior. Coaching styles can be divided into two types: autonomy-supportive and controlling. Autonomy-supportive coaching styles means the coaches allow the athletes to involve in the decision-making process,

reduce pressure and consider their feelings. Theoretically, since the autonomy support from coaches increases the self-motivation and psychological well-being of the athletes, it is believed that athletes under autonomy-supportive coaching style have less intention to dope. In contrast, the controlling coaching style is positively associated with doping behaviors because coaches give less recognition to the feeling of the athletes and behave in pressuring and coercive way. Chen, et al. (2017) pointed out in their study on the Chinese athletes from Fujian that controlling coaching style is positively associated with the attitudes towards doping. The result also demonstrated that moral disengagement mediated the relationship between such coaching style and the attitudes towards doping. However, there was no direct or indirect effect between autonomy-supportive coaching style and attitudes towards doping.

In addition to the different coaching styles, the coach-athlete relationship and the anti-doping knowledge of the coaches are also considered to be the important factors affecting athletes' attitudes. There is a previous study on Australian and Greek athletes showed that a close and trusty coach-athlete relationship can facilitate a desirable environment to help preventing doping among athletes depending on the coaches' beliefs on doping (Barkoukis, V., Brooke, L., Ntoumanis, N., Smith, B., & Gucciardi, D. F., 2019). The stronger the relationship between coaches and athletes, the greater the effect coaches have on athletes' decision making towards doping. Hence, the level of anti-doping knowledge of coaches is essential in shaping the athletes' appropriate morals and standards towards doping. The World Anti-Doping Code (2021) emphasized the importance for the athlete support personal including coaches to be knowledgeable of the anti-doping policies and rules in order to use their influence on athletes' values and behavior to foster anti-doping attitudes. Engelberg, T., Moston, S. (2016) suggested that the lack of anti-doping knowledge of coaches may indirectly support doping.

Gebert, A., Stamm, H., Kamber, M., & Lamprecht, M. (2019) studied the Swiss athletes and coaches' perspective of the fight against doping. More than half of the Swiss athletes (56%) indicated that coaches were a source of information in respect to doping and supplements, however, 43% of the coaches expressed they did not receive sufficient information of doping in their coach education. A similar study on French coaches' attitudes toward doping (Laure, P., Thouvenin, F., & Lecerf, T., 2001)

addressed that 98% of the coaches considered themselves having a significant role in preventing doping yet 80% of them expressed that they did not have enough training on this subject.

Although this study is focusing on the elite athletes in Hong Kong, the study on the Hong Kong community coaches (Fung, L., 2006) may provide some insights on the relationship between the coaches and athletes' attitudes because when any athletes first started playing their sports, the community coaches were the first coach which they encountered before they became elite athletes. Fung, L. (2006) found out that the community coaches in Hong Kong were relatively supportive to the anti-doping movement, yet they tended to underestimate their anti-doping knowledge. Since coaches are one of the sources of anti-doping information to athletes (Gebert, A. et al., 2019), it is important for them to be confident in delivering anti-doping information and foster a positive attitude toward anti-doping to their athletes.

### **3. Data Collection**

#### **3.1. Participants**

This study mainly focuses on finding out how the elite athletes in Hong Kong perceive anti-doping. To define a participant as an elite athlete, the participants must be receiving the Elite Training Grant (ETG) of the HKSI no matter they were full time or part time athletes. ETG is a direct financial support to the elite athletes of Tier A sports and sports supported under the Individual Athletes Support Scheme (IASS) as well as the elite para-athletes of Tier A and Tier B sports, and sports supported under the IASS from the Hong Kong government based on their sport performance and results. There was a total of 840 elite athletes in different sports receiving the ETG in 2021-2022, however, in view of the limited time in collecting responses, the limited access to the contacts of all elite athletes and the personal data privacy, only those elite athletes who were also included in the ADOHK Testing Pools (Registered Testing Pool and Elite Testing Pool) were invited to participate in this study. These Testing Pool athletes were receiving the ETG Elite A+, Elite A, Elite B+ and Elite B categories which are the top 4 levels of the ETG. As a result, 290 elite athletes across 32 different sports were selected to be the target participants for this study.

### 3.2. Methods

Surveys are widely used when finding out people's perceptions, opinions and ideas, especially in social and psychological research. It is considered to be an effective way to collect massive responses from a large group of participants. In a survey, three different types of questions can be designed, namely fixed-alternative, scale and open-ended questions. Having different types of questions can help to enrich the content of the survey. In this study, the anti-doping perceptions of the elite athletes were to be analyzed and there was a high number of participants to be involved, considering the advantages of using a survey to collect massive data and its effectiveness in finding out the participants' perceptions, therefore survey was chosen as the tool to collect responses from the participants.

When developing questions of the survey for this study, the Sport Drug Control Model (SDCM) developed by Donovan, R. J., Egger, G, & Kapernick V (2002) was considered. The six key factors in the SDCM were used to design ten 5-point scale questions in order to find out the relationship between each factor and the athletes' perceptions of anti-doping. The response options for the 5-point scale were strongly disagree, disagree, neither agree nor disagree, agree and strongly agree. It provided a reliable way to measure perceptions or behaviours of the participants in different degree. Furthermore, two fixed-alternative questions related to anti-doping education and information were designed for the participants to indicate their preferences. An open-ended question about the existing anti-doping system was also included to collect qualitative data in order to supplement the quantitative data collected. A set of demographic questions such as gender, age and the participant's sport were put at the end of the survey. The survey was considered to be anonymous. All the questions except the open-ended question were set to be compulsory to answer. Since most of the elite athletes were Chinese, the questions were in both Chinese and English in a single survey so the participants could choose the language they preferred.

The survey of this study was put online using an internet-based platform so it was easy and convenience for the participants to access and complete the survey. The online survey was sent to the participants through individual emails using the ADOHK Testing Pool database. Approval of using the database had been sought from the Head of ADOHK Office in advance. The participants were informed about the purpose of the

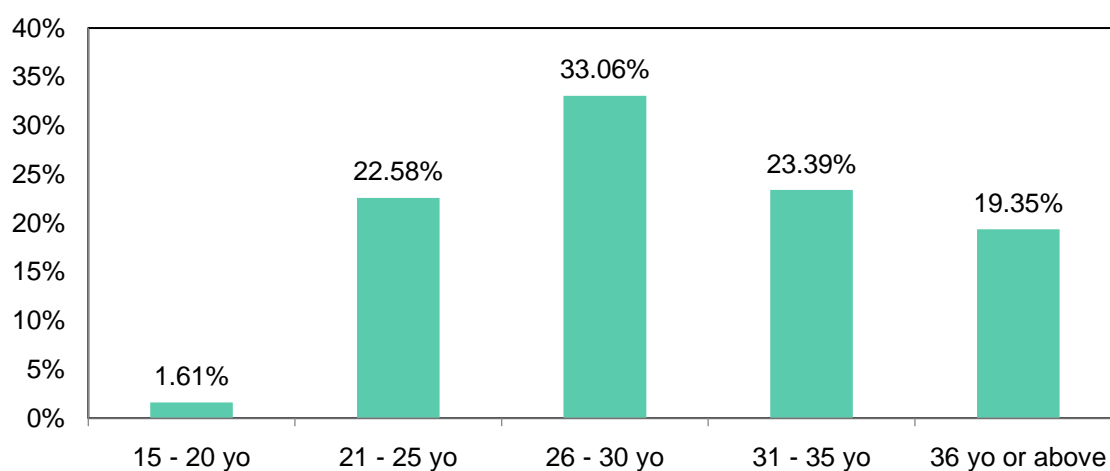
survey and all the responses collected were kept confidential and were solely used for this study in the email. Since some of the questions were asking about the athletes' intention of using PES under different scenarios and circumstances based on the key factors of the SDCM, it is possible that the participants were reluctant to reveal their actual behaviours hence did not want to give honest and truthful answers, in order to avoid themselves being stigmatized even though the survey was anonymous. Another limitation of using a survey is unable to ask the participants to explain the responses they provided especially in the 5-point scale questions.

## 4. Results

### 4.1. Samples Characteristics

Of the 124 surveys returned (response rate: 42.76%), 53 (42.74%) were male and 71 (57.26%) were female. The athletes were represented from 27 different elite sports in Hong Kong, the top five sports with the most response rate were rugby (11.29%; n=14), aquatics (9.68%; n=12), billiard sports (7.26%; n=9), fencing (7.26%; n=9) and wushu (6.45%; n=8). Figure 2 shows that most of the athletes (33.06%; n=41) were aged between 26 – 30 years old, followed by 31 – 35 years old (23.39%; n=29), 21 – 25 years old (22.58%; n=28), 36 or above (19.35%; n=24) and lastly 15 – 20 years old (1.61%; n=2).

Figure 2: Athletes' age group



#### 4.2. Perceptions on Anti-Doping in Hong Kong

Athletes were asked about their perception on the Anti-Doping Rules and doping issues in Hong Kong by compulsory 5-point scale questions (response options: strongly agree, agree, neither agree nor disagree, disagree and strongly disagree). 84 (67.74%) and 13 (10.48%) athletes agreed and strongly agreed respectively that they fully understood the Anti-Doping Rules and Regulations in Hong Kong, while 18 (14.52%) of them neither agree nor disagree and 9 (7.26%) disagreed. Among those who agreed and fully agreed, there was no significant difference in total between male (75.47%; n=40) and female (80.28%; n=57) as shown in Figure 3. The results showed that athletes generally thought they understood and had sufficient knowledge of the Anti-Doping Rules and Regulations in Hong Kong.

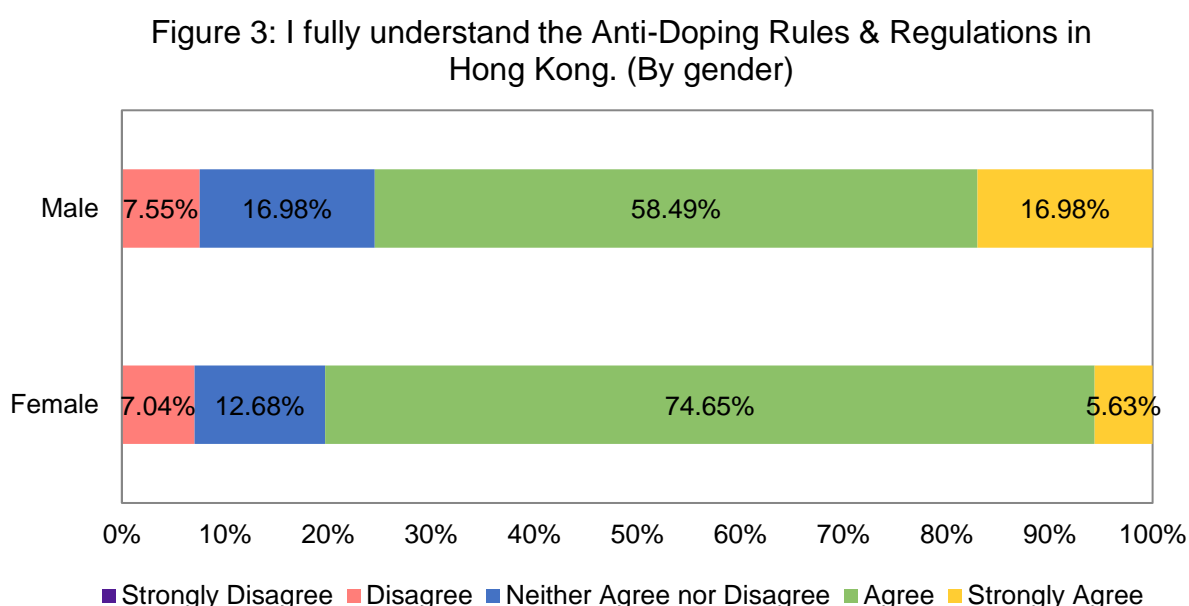
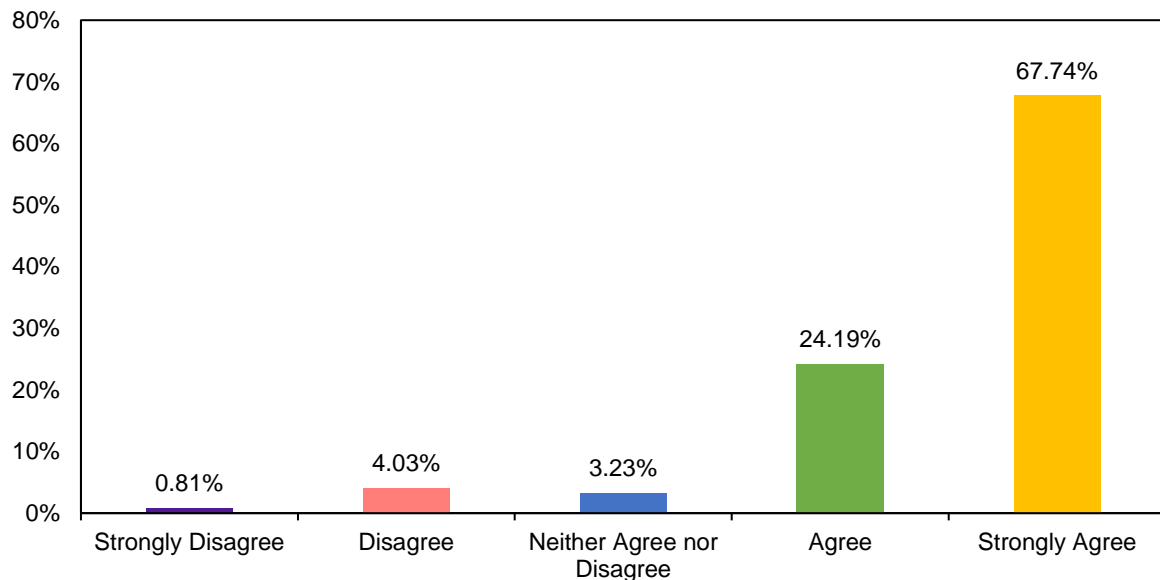


Figure 4 shows that the majority athletes strongly agreed (67.74%; n=84) and agreed (24.19%; n=30) that doping is totally unacceptable in sports, meaning that most of the athletes disapproved the use of performance enhancing substances (PES). However, there were 1 (0.81%) team sport athlete and 5 (4.03%) individual sports athletes strongly disagreed and disagreed with this statement respectively, while 4 (3.23%) athletes from individual sports were neutral. Although it was a small number (10 out of 124 athletes), it was still surprising to know that a few elite athletes did not think doping is totally unacceptable in sport. To look further into these 10 athletes in the aspect of

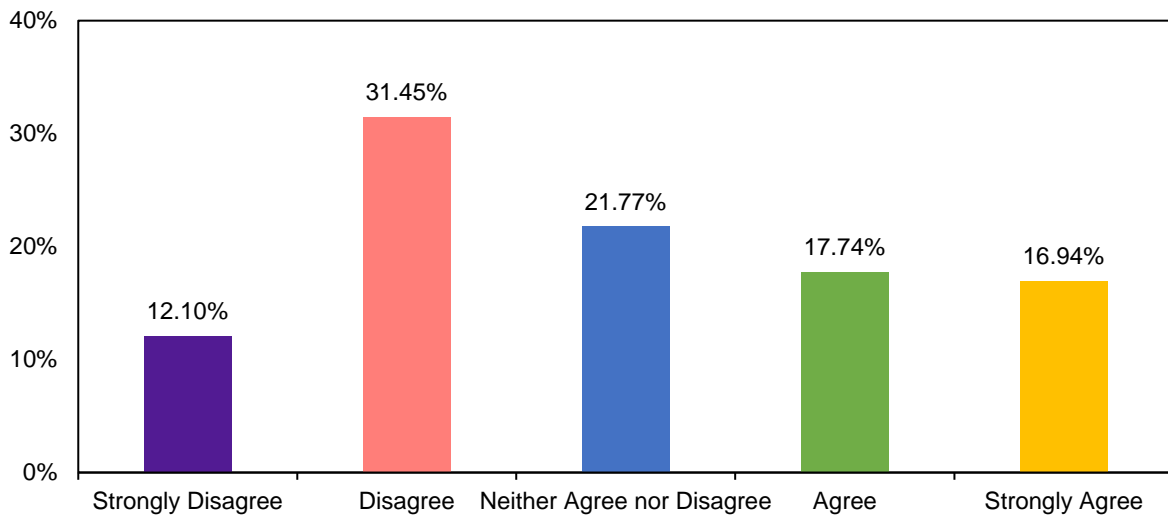
their perceived understanding of the Anti-Doping Rules and Regulations, only 1 of them expressed that he/she did not fully understand, 4 showed neutral and the rest (5) agreed that they fully understood the rules.

Figure 4: Doping is totally unacceptable in sports.



Athletes were also asked whether they thought doping was a serious problem in Hong Kong. Figure 5 shows over 40% of the athletes disagreed (31.45%; n=39) and strongly disagreed (12.10%; n=15). On the other hand, it was interesting to find out that almost 35% (n=43) of them agreed (17.74%; n=22) and strongly agreed (16.94%; n=21) doping was a serious problem in Hong Kong. There was no significant difference in the responses between male and female athletes. When comparing the responses within the same age groups, 100% (n=2) and almost half (48.27%; n=14) of the athletes aged between 15 – 20 years old and 31 – 35 years old respectively perceived doping was a serious problem. Out of the 35% who expressed that doping was a serious problem in Hong Kong, all of them except one agreed or strongly agreed that the Anti-Doping Rules were fair and just to protect clean athletes and the other one was neutral, which implies that even though they thought doping was a serious problem in Hong Kong, they trusted that the anti-doping system could protect clean athletes.

Figure 5: Doping is a serious problem in Hong Kong.



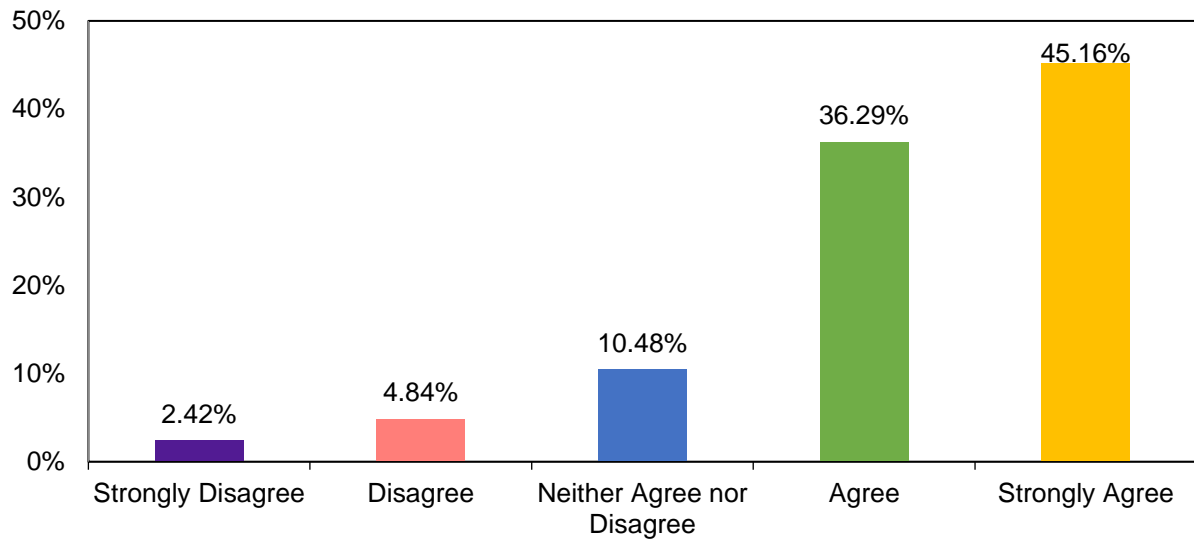
#### 4.3. Attitudes towards Doping in Sports

Athletes' attitudes towards doping were assessed by the 5-point scale questions in reference of the Sport Drug Control Model (SDCM). Some of the elements in the SDCM such as threat appraisal, benefit appraisal, reference group influences, personal morality and legitimacy, were taken into considerations when designing the questions.

##### **Threat appraisal**

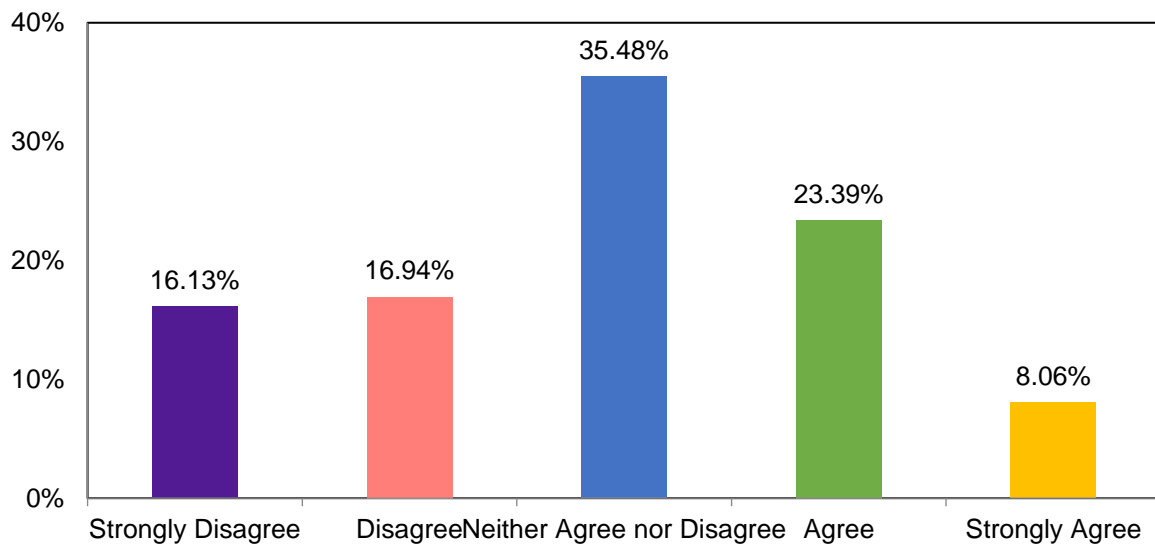
Enforcement variables were used in measuring the threat appraisal of the PES use amongst the athletes. Figure 6 shows the athletes' intention to use any PES based on their perceived severity of the consequences and sanctions of doping. Almost half of all athletes (45.16%) strongly agreed that the consequences and sanctions were punitive enough to discourage them from using any PES, followed by 36.29% of the athletes agreed. Among the athletes who expressed strongly disagreed (2.42%) and disagreed (4.84%), 2 of them thought they did not fully understand the anti-doping rules and regulations and 1 disagreed that doping is totally unacceptable in sports.

Figure 6: The consequences and sanctions of doping are punitive enough to discourage me from using any performance enhancing substance.



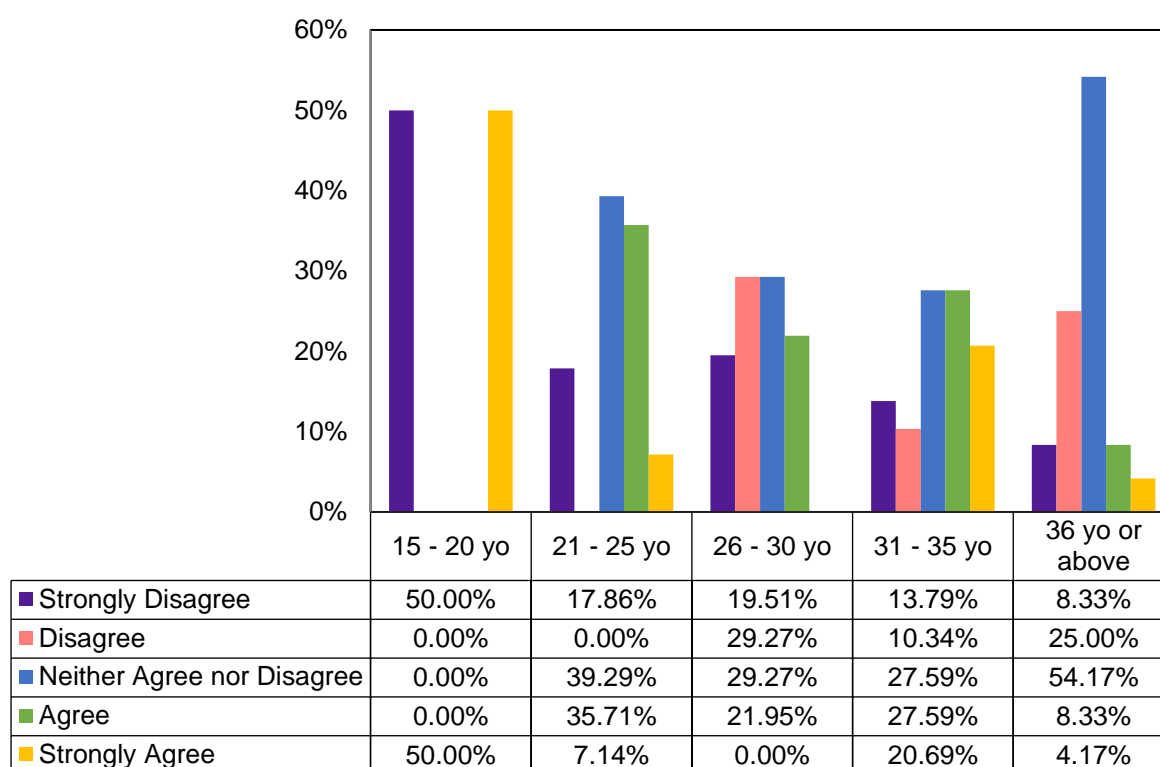
In addition to the effect of the severity of the consequences and sanctions of doping, athletes were also asked about the likelihood of using a PES if they were tested more frequently. The results were shown interestingly in Figure 7 that there was no significant difference between the athletes' intentions of using a PES based on the frequency of doping tests conducted on them. 33.07% of the athletes strongly disagreed (16.13%; n=20) and disagreed (16.94%; n=21) that the more they were tested, the less intention they had to use a PES; while 31.45% agreed (23.39%; n=29) and strongly agreed (8.06%; n=10) the frequency of doping tests conducted would reduce the likelihood of using a PES. 35.48% (n=44) of the athletes did not have any comment.

Figure 7: I will be less likely to use a performance enhancing substance if I am tested more frequently.



In comparison within the same age group as presented in Figure 8, athletes aged 21 – 25 years old (42.85%; n=12) and 31 – 35 years old (48.28%; n=15) tended to be less likely to use a PES if being tested more frequently, while more athletes within 26 – 30 years old (48.78%; n=20) and 36 years old or above (33.33%; n=8) responded differently that being tested more would not discourage them from using PES.

Figure 8: I will be less likely to use a performance enhancing substance if I am tested more frequently. (By age group)



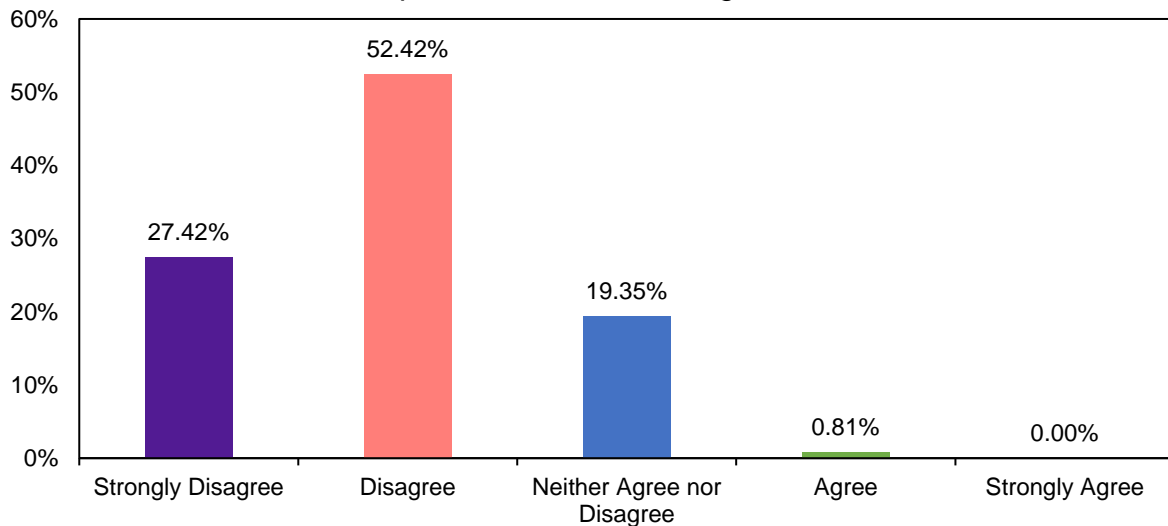
Remarkably, among those who expressed the frequency of conducting tests would not discourage them from using a PES, only 17.07% (n=7) of them responded that the consequences and sanctions were not punitive enough to discourage them from using PES, and over two-third (70.73%; n=29) of them expressed they would not use a PES because of the severity of the consequences and sanctions of doping; while all athletes who responded the more they were tested, the less intention of using a PES they had, expressed that they would not use a PES because the consequences and sanctions were punitive enough.

### Benefit Appraisal

Over 75% of the athletes disagreed (52.42%; n=65) or strongly disagreed (27.42%; n=34) that athletes with excellent sports results must be using some sort of PES as shown in Figure 9. The only one female athlete who agreed to this statement also perceived doping was a serious problem in Hong Kong. The result suggested that the majority of athletes did not consider the use of PES was a factor to achieve excellent

sports results and the benefit of using PES was not effective in having advantage over the athletes who refuse to use.

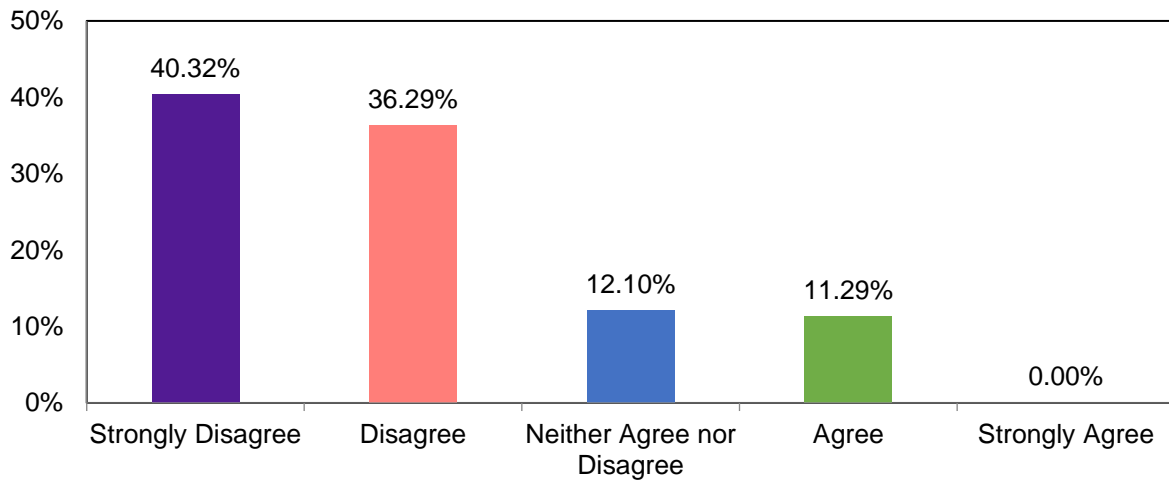
Figure 9: Athletes with excellent sports results must be using some sort of performance enhancing substance.



### Reference Group Influences

Athletes were asked about how their teammates and opponents' behaviors towards doping would affect their intentions of using PES. Figure 10 shows that over 75% of the athletes either strongly disagreed (40.32%; n=50) or disagreed (36.29%; n=45) that they would be more likely to use a PES if they knew their teammates and opponents were also using it, and 11.29% (n=14) agreed that it would increase their likelihood of using PES. To further analyze these 14 athletes, it is interesting to find out all of them either agreed or strongly agreed that doping was totally unacceptable in sports before responding to this question. All of them also expressed that the consequences and sanctions of doping were punitive enough to discourage them from using any PES.

Figure 10: I will be more likely to use a performance enhancing substance if I know my teammates and opponents are also using it.



Other than the teammates and opponents, the athletes were also asked about how the perceptions of their family members and friends towards them if they were caught affect their intentions of using PES. Figure 11 presents the majority (86.29%) of athletes strongly agreed (52.42%; n=65) or agreed (33.87%; n=42) that they would never use a PES because they did not want to disappoint their family members and friends; while 2 athletes disagreed (0.81%) or strongly disagreed (0.81%) and 12.10% (n=15) had no comment. Figure 12 shows that the 2 athletes who disagreed and strongly disagreed were both male athletes. The difference between gender was small. The athlete who disagreed with this statement also expressed that he would use a PES if his teammates or opponents were also using it.

Figure 11: I will never use a performance enhancing substance because I do not want to disappoint my family members and friends.

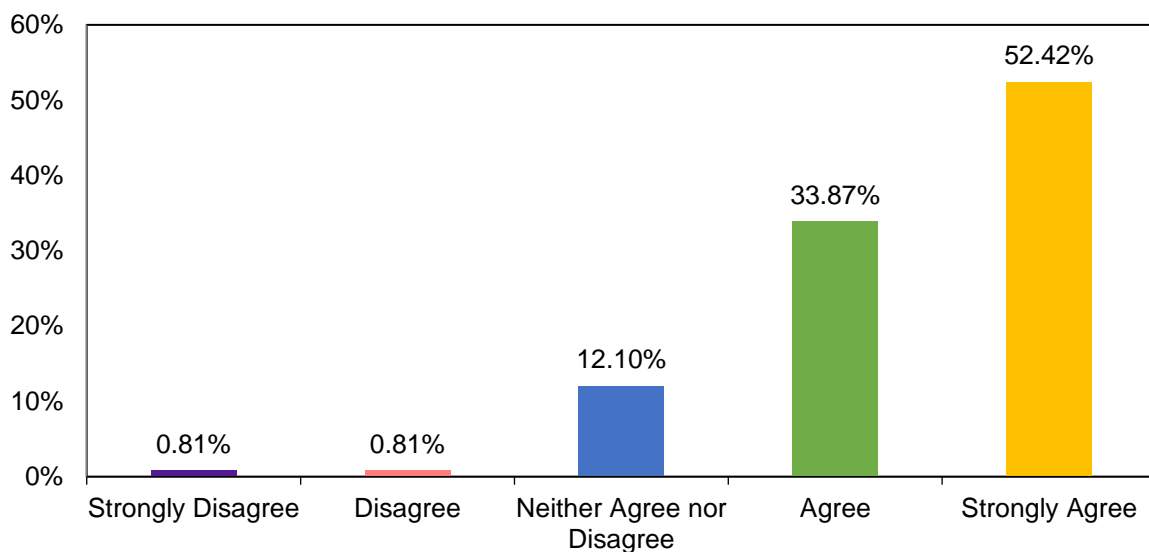
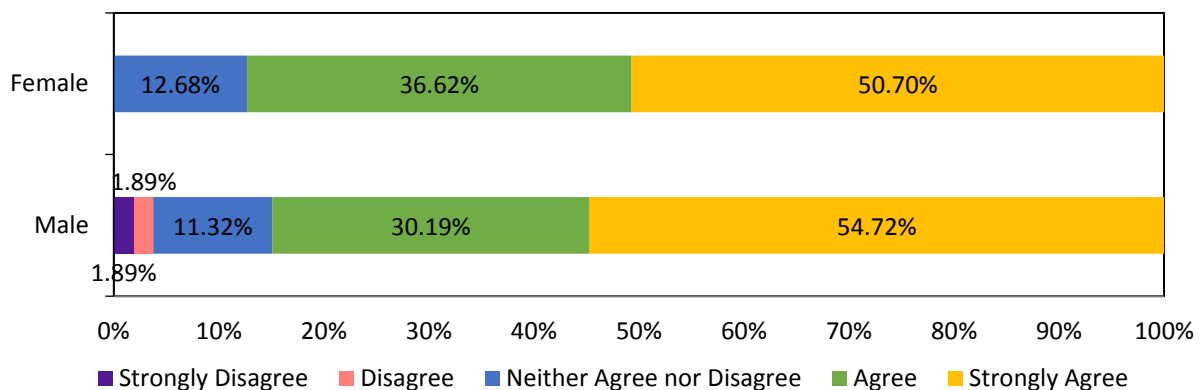


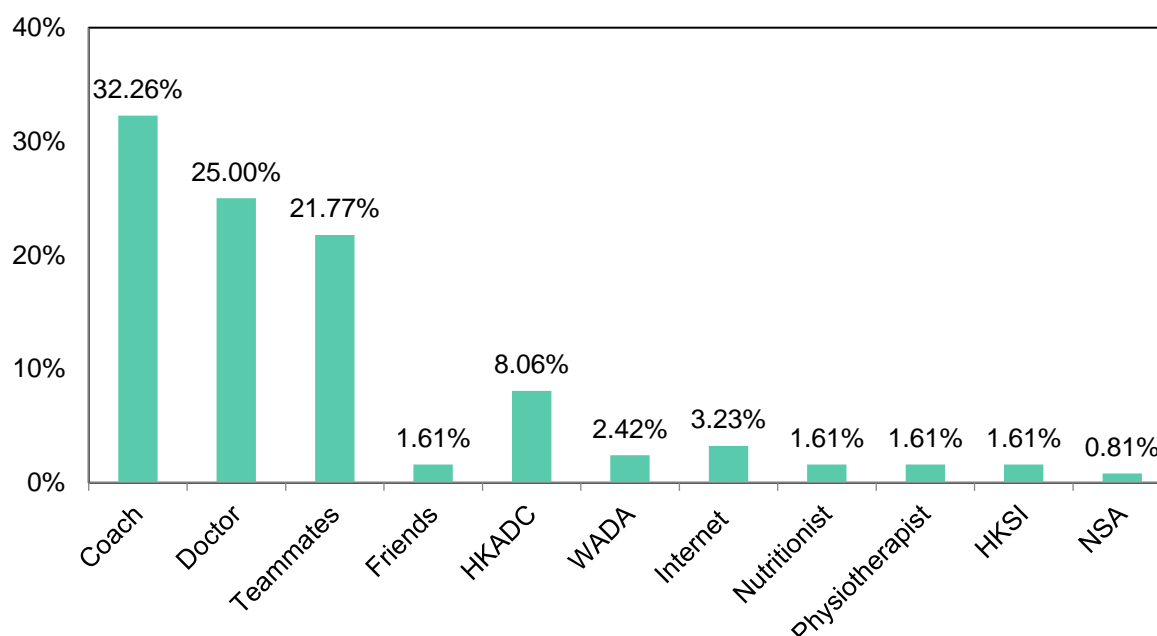
Figure 12: I will never use a performance enhancing substance because I do not want to disappoint my family members and friends. (By gender)



Athletes' preferences about whom they would first refer to if they had any questions regarding anti-doping is presented in Figure 13. Athletes were given the choices of coach, doctor, teammates, friends and others (please specify) to choose from. 32.26% (n=40) of them would first go to their coaches, followed by 25.00% (n=31) would consult their doctors, 21.77% (n=27) would ask their fellow teammates, and only 1.61% (n=2) would ask their friends. For the rest (19.35%; n=24) of the athletes who specified some other options, 8.06% (n=10) would turn to the staff of ADOHK, 3.23% (n=4) would look for answers on the internet themselves and 2.42% (n=3) would ask

WADA. The result showed the relative influence of different reference groups for the elite athletes with respect to anti-doping issues and questions.

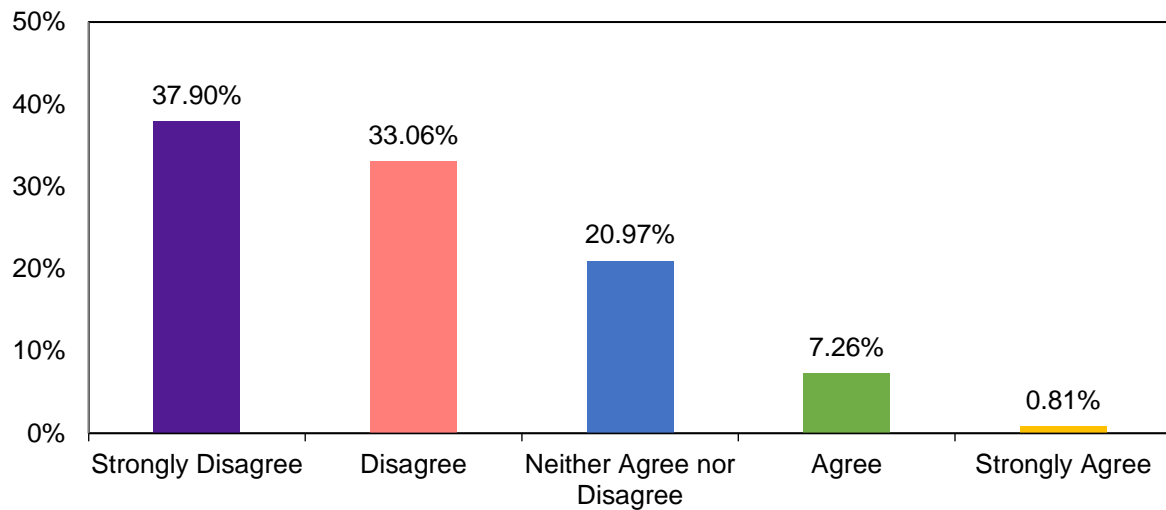
Figure 13: Whom will be the first person you turn to if you have any questions regarding anti-doping?



### Personal Morality

Personal morality always associates with the values in sports among athletes, such as respect for others, respect for rules, honesty, etc. Athletes were asked whether they would use a PES if they perceived a zero probability of getting caught for doping. Around 70% of the athletes either strong disagreed (37.90%; n=47) or disagreed (33.06%; n=41) that they would be more likely to use a PES if it was not detectable, while 7.26% (n=9) agreed and 0.81% (n=1) strongly agreed that they would have a higher chance of using a PES if they would not be caught as shown in Figure 14. Among these 10 athletes where 70% (n=7) of them were female and 30% (n=3) were male, 6 of them also agreed that they would be more likely to use a PES if their teammates and opponents were also using it, and only 1 of them did not agree doping was totally unacceptable in sports. If we look into the severity of the consequences and sanctions of doping, 9 of them agreed that it was punitive enough to discourage them from doping.

Figure 14: I will be more likely to use a performance enhancing substance if it is not detectable.



### Legitimacy

According to the SDCM, the higher number of athletes perceived the anti-doping rules and regulations were just, the greater the perceptions of legitimacy and therefore greater likelihood of compliance with the rules and regulations. Figure 15 shows that over 85% of the athletes agreed (46.77%) or strongly agreed (38.71%) the Anti-Doping Rules were fair and just to protect clean athletes, while 12.9% neither agree nor disagree and only 1.61% (n=2) disagreed. However, there was a possibility that the athletes might not have given their real feelings, especially to ADOHK, even though the survey was anonymous. Figure 16 shows a rather large difference between genders. There were more female athletes agreed and strongly agreed that the Rules were and fair and just compared to male athletes. Figure 16 also indicates that the two athletes who disagreed were male athletes. When looked into the question asking whether these two athletes fully understood the rules and regulations, both of them showed either neutral and disagreed. The result showed that most of the athletes had confidence in the Anti-Doping Rules to safeguard a doping-free sporting environment for them to participate in.

Figure 15: I think the Anti-Doping Rules are fair and just to protect clean athletes.

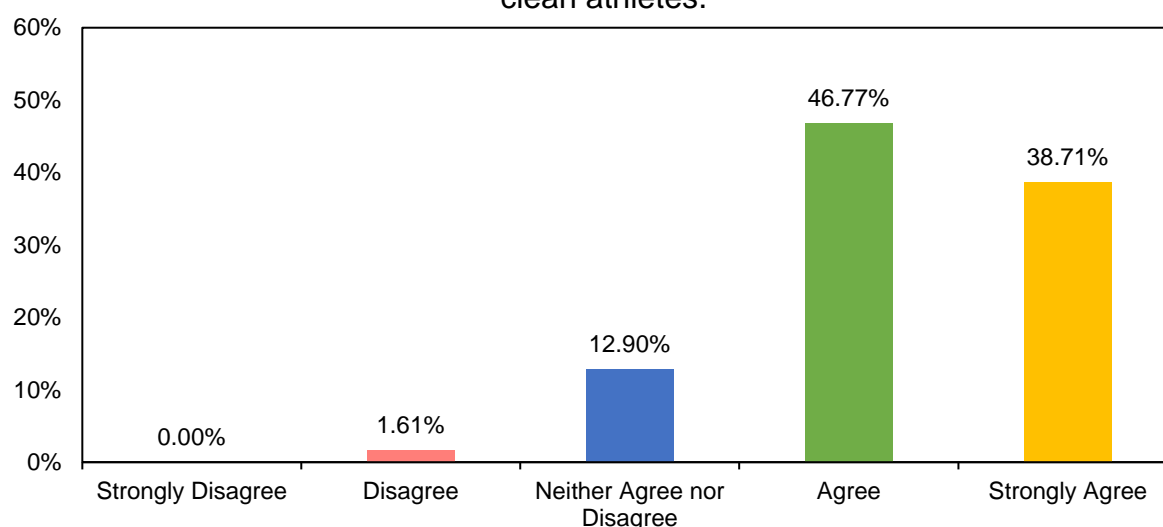
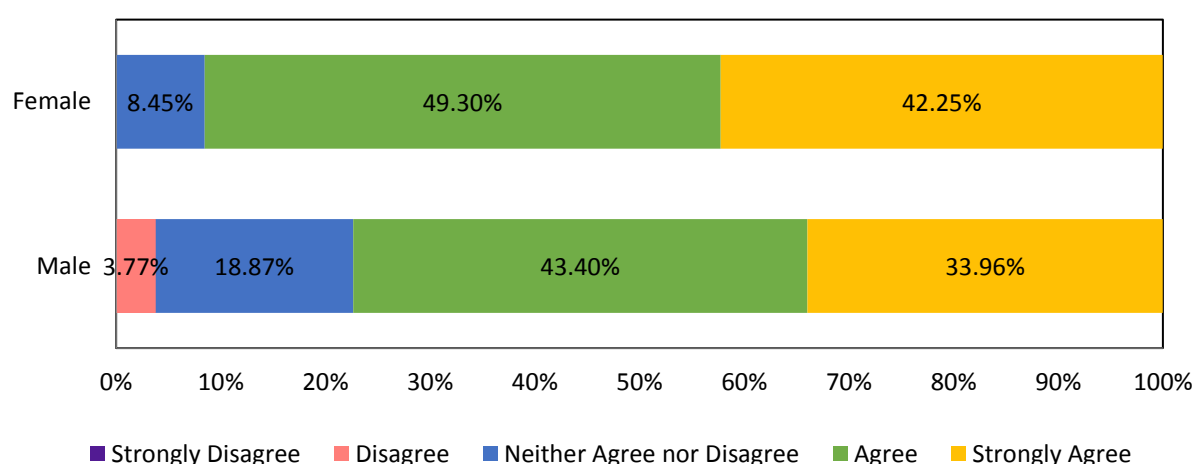


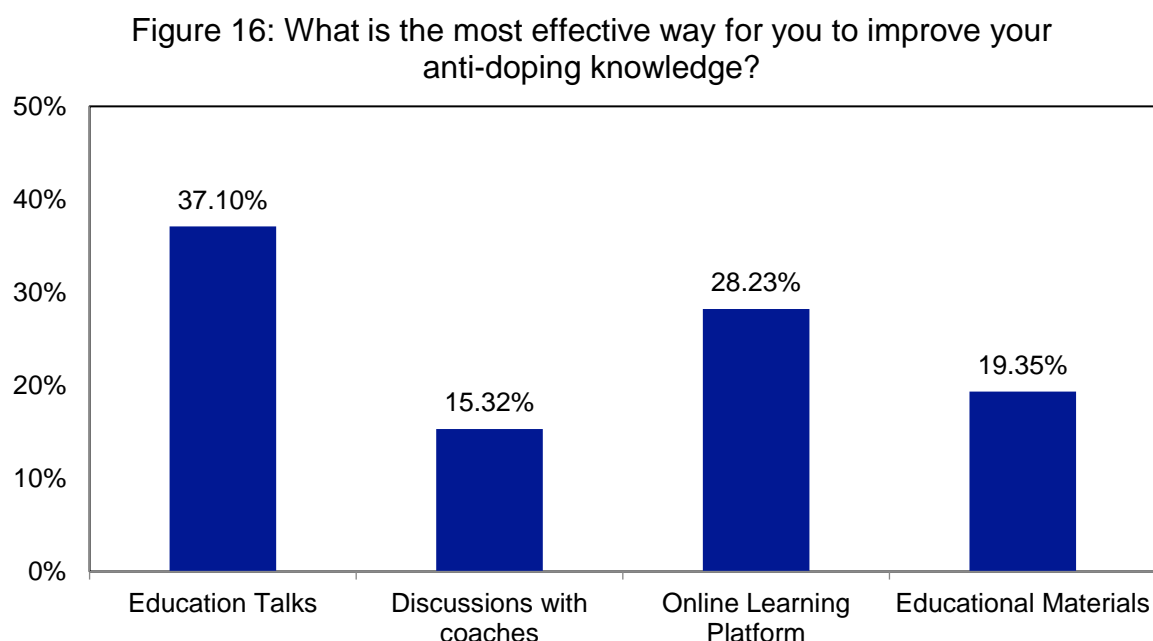
Figure 16: I think the Anti-Doping Rules are fair and just to protect clean athletes. (By gender)



#### 4.4. Way to Improve Anti-Doping Knowledge

Athletes were asked to choose the most effective way for them to improve their anti-doping knowledge from 4 options, namely education talks, discussions with coaches, online learning platform and educational materials. Figure 16 shows that more than one-third (37.10%; n=46) of the athletes picked education talks, followed by online learning platform (28.23%; n=35), educational materials (19.35%; n=24) and discussions with coaches (15.32%; n=19). Interestingly, among the 40 athletes who would turn to their coaches first if they had any anti-doping questions as shown in

Figure 12, only 8 (20%) of them thought discussions with coaches was the most effective way to improve anti-doping knowledge.



#### 4.5. Improvements in the Anti-Doping System

The summary of the answers for the optional open-ended question about what the athletes thought can be improved in the anti-doping system is presented in Table 1. 100 (80.65%) athletes responded to this question and 2 of them provided suggestions in more than one category. The suggested improvements could be put into 5 categories, i.e. testing, education, consequences and sanctions of doping, the system was good enough, and no comment. There was a total of 26 athletes suggested different improvements in the testing category. It was interesting to find out there were opposite opinions regarding the number of doping tests, some athletes expressed the number of doping tests was too frequent yet others suggested the number of tests could be more frequent. 16 athletes provided suggestions in education and 2 athletes suggested to increase the severity of the consequences and sanctions of doping or missed tests. 6 athletes thought the current anti-doping system was good enough and 52 athletes did not have any comment on the current system.

Table 1: What do you think can be improved in the anti-doping system?

Category	% of athletes responded	Suggested improvements provided by the athletes
Testing	26%	<ol style="list-style-type: none"> <li>1. Some athletes commented the number of doping tests was too frequent; while some suggested it could be more frequent</li> <li>2. The website and mobile application for providing whereabouts information should be improved</li> <li>3. More flexibility on updating whereabouts information and locating athletes for doping tests</li> <li>4. Suggested to conduct blood testing instead of urine</li> <li>5. Public disclosure of athletes with both positive and negative test results</li> <li>6. More elite athletes should be included in the ADOHK testing pools</li> <li>7. Professionalism of the Doping Control Officer</li> </ol>
Education	16%	<ol style="list-style-type: none"> <li>1. Increase the accessibility of anti-doping information to athletes and the public</li> <li>2. More information on the side effects of PES</li> <li>3. More information on inadvertent doping, especially Chinese medicine and supplements</li> <li>4. Ensure the latest anti-doping information will be shared to the athletes</li> <li>5. Clearly explain the Prohibited List, testing procedures and different policies</li> <li>6. More education talks</li> <li>7. Coaches should be more actively involved in delivering anti-doping information and promoting sports ethics</li> <li>8. More sharing from athletes</li> </ol>

Consequences and Sanctions	2%	1. Increase the severity of the consequences and sanctions of doping or missed tests
Good enough	6%	No improvement suggested
No comment	52%	No improvement suggested

## 5. Discussion

The purpose of this study was to identify and understand the anti-doping perception of the elite athletes in Hong Kong as well as the factors that affect their behaviors and attitudes towards the use of PES. To understand and examine the significant of different factors, the Sport Drug Control Model (SDCM) (Donovan, R. J., Egger, G, & Kapernick V, 2002) was used. In WADA's recent study on Athlete Vulnerabilities Research Project: Descriptive Report on Sport Stakeholders' Beliefs about Athlete Doping Vulnerabilities and Related Factors (2022), the survey results showed that the international and national level athletes were considered to have a higher risk of doping compared to athletes at other stages along Athlete Pathway. In this study, all elite athletes in Hong Kong are at international and national levels, therefore it is noteworthy to identify which factors have the most impact on their attitudes towards doping.

The results of the present study suggested that the elite athletes in Hong Kong generally perceived they understood and had sufficient knowledge about the Anti-Doping Rules and Regulations. It is apparent that ADOHK has been effective in delivering the Rules and Regulations to the athletes through different educational channels. On the other hand, the athletes held negative attitudes towards the use of PES in general however it was notable that there was still a small number (8.01%) of athletes did not consider doping was totally unacceptable in sports. Although according to the record of ADRV cases in Hong Kong managed by ADOHK, there were less than a total of 5 ADRV cases in the past 5 years between 2018 – 2022, there was a substantial portion of athletes (35%) thought doping was a serious problem in Hong Kong and these athletes were across different sports. It could either imply that the athletes perceived the existing number of ADRV cases in Hong Kong was high and unacceptable, or they noticed some doping issues occurred but not

being caught by any anti-doping authority in their sports. Further investigation should be followed up on this issue.

Most of the athletes in this study expressed that they refrained from doping because they considered the consequences and sanctions of doping were punitive. This result aligned with the assumption of the enforcement variable of the perceived severity of the sanctions for testing positive underlined by the SDCM that athletes were less likely to use a PES because of their fear of getting caught and the subsequent sanctions. However, when it comes to the enforcement variable of perceived likelihood of being tested, the effect was not as significant as the perceived severity of the sanctions. The result showed almost indifferent between whether the athletes would be discouraged to use a PES if they were tested more frequently. These results seem to suggest that by emphasizing the severity of the consequences and sanctions of being tested positive to the athletes would have a more significant impact on reducing the likelihood of using a PES than the increase in frequency of conducting doping tests. On them.

When the athletes were asked about the benefit of using PEDs which was specified as a “promise” by the Health Belief Model (Becker, M. H., 1974) in reverse to the “benefit appraisal” of the SDCM, the athletes in general did not think using PESs would help delivering excellent sports results. The result did not suggest the same as the WADA’s study (2022) which identified performance enhancement as the most relevant motivations for doping by athletes. To compare the results between the threat and benefit appraisal according to the instrumental perspective in the SDCM, it indicated that when the athletes considered the cost-benefit analysis between the actual and potential negative consequences of using PESs (i.e. the severity of sanctions for testing positive) and the actual and potential positive consequences (i.e. the achievement of excellent sports results) in their decision making, the perceived cost outweighed the perceived benefits on whether they would use PESs or not.

The athletes in this study had strong moral values against doping. Even though if the PES was not detectable, most of them (70.96%) expressed that it would not increase the likelihood to dope. In Donovan et. al.’s study, personal morality was considered to be the strongest association with attitude towards doping, where athletes with a lower moral stance against doping would be more likely to use a PES. However, although

there were only a small number of athletes seem to hold a weaker moral belief against doping, it should not be neglected as suggested by G. Jalleh et. al.'s study (2013) that morality was one of the largely ignored areas in anti-doping education. Hence, value-based sporting interventions can be developed to promote the positive moral values among the athletes.

The SDCM suggested that the authority's legitimacy would be enhanced if the athletes perceived the anti-doping rules and regulations to be fair and just. In this study, only 2 athletes disagreed that the rules and regulations in Hong Kong were fair and just to protect clean athletes. The result showed that athletes' perceptions of ADOHK's legitimacy was high. From a normative perspective of the SDCM which focuses on attitudes and values, personal morality and perceptions of authority's legitimacy were the major variables of compliance. With a strong moral stance and high perception of ADOHK's authority, the elite athletes in Hong Kong tend to comply with the rules because they think it is the right things to do and have confidence in the anti-doping system regardless of the severity of the sanctions.

It is essential to find out which reference groups has a relatively higher influence to the athletes' attitudes towards doping. Several primary contact groups were considered in this study, namely teammates or other athletes, family members and friends. The result showed the attitudes towards doping of a small percentage of athletes would be affected if they knew their teammates or opponents were using PES. This small group of athletes would be easily influenced by the bad behaviors of their peers which aligned with WADA's study that negative social environment was among the most important doping vulnerabilities factors nominated by athletes. On the other hand, avoidance of causing disappointment of the athletes' family members and friends imposed a significant impact on discouraging the use of PES. It showed that the athletes' social norms indicated their reference groups of family members and friends were strongly against the use of PES. The result implied that the elite athletes in general concerned about how their families and friends see them, they would not want to disappoint them because of doping. They considered their reputations to these primary contact groups and getting approval from them were important.

In WADA's study (2022), it showed that coaches were perceived as the most influential athlete support personnel across all stages of the athlete pathway as well as the second most consulted source of information by athletes. When comparing the results of the present study, the elite athletes in Hong Kong also expressed the importance of their coaches in the area of anti-doping since over 30% of the athletes would ask their coaches first if they had any questions regarding anti-doping. However, when the athletes were asked about the most effective way to improve their anti-doping knowledge, only 15.32% chose the discussions with coaches which was the lowest number among other options (i.e. education talks, online learning platform and educational materials). It is believed that the elite athletes found the coaches were the most immediate contact and approachable when they had any anti-doping questions yet when it comes to improving their anti-doping knowledge, they did not think discussions with coaches would be effective. In Fung's study (2006) of the community coaches in Hong Kong, she found the actual knowledge on PES of the coaches was fair and had room for improvement. Although these community coaches were not the same as the coaches for the elite athletes, it could be used as a reference that athletes perceived coaches would have basic anti-doping knowledge to answer some general questions, however, they did not perceive their coaches had in-depth knowledge to educate them. Some athletes also suggested in the present study that coaches should be more actively involved in delivering anti-doping information and promoting sports ethics. Since coaches are so salient and influential to athletes, there is a need for the coaches to be equipped with sufficient anti-doping knowledge not only to answer questions from athletes and educate them, but also help to foster positive moral values and hence develop strong beliefs and attitudes against the use of PES.

Other than the coaches, quite a few athletes would also turn to their doctors and teammates first if they had any anti-doping questions while only a small number of athletes (8.06%) would go to ADOHK. There is a possibility that the athletes preferred to go to their coaches, doctors or teammates because they could easily reach out to these groups of people in order to get immediate answers from them, while it could take time to get a response from ADOHK or look for answers on ADOHK website. Compared to WADA's study (2022), the result was similar to the present study that athletes rated the NADO website as a relatively low source of information. According to the World Anti-Doping Code 2021 Article 20.5.9, each NADO shall be the authority

on Education within their respective countries. NADOs including ADOHK should encourage athletes to consult with them if they have any questions or concerns regarding anti-doping so as to ensure accurate and up-to-date information is delivered. In the open-ended question of the present study asking about ways to improve the anti-doping system, there was a suggestion of increasing the accessibility of anti-doping information to athletes and the public. Further study such as focus group with the elite athletes could be done to find out the reasons why they would not go to ADOHK first for anti-doping information as well as suggest ways to improve this situation to encourage the athletes to check with ADOHK whenever they have any questions.

In view of anti-doping education, the athletes perceived education talks as the most effective way to improve their anti-doping knowledge and some athletes also suggested to organize more education talks with clear explanation of the Prohibited List, testing procedures and policies; sides effect of PES; as well as more information on inadvertent doping especially the Chinese medicine and supplements. It was suggested in the WADA's study (2022) that although nutritional supplements were not identified to be the most important vulnerability factors by athletes, there was a possibility that the athletes were in fact unaware of the risks of supplements use. Furthermore, international level athletes were perceived to have the highest risk of inadvertent doping along the athlete pathway. Therefore, more focus should be put in the topic of inadvertent doping in education talks and clearly explain the causes so as to help the elite athletes to develop a mindset and attitude to avoid the risks. Moreover, effect of doping on health should also be emphasized in the education program since from the abovementioned findings that the negative consequences of using PESs has a more significant effect on discouraging athletes from doping.

Besides, when athletes were asked for ways to improve the anti-doping system, there were opposite opinions on the frequency of testing, some athletes expressed that the number of doping tests was too frequent while some thought the number should be increased. According to ADOHK's Out-of-Competition (OOC) testing statistics, the total number of OOC tests was 343 in the year of 2021, 110 in 2020 and 97 in 2019. Only an average of 1.18 tests were conducted on each ADOHK testing pool athletes in 2021 and the number was even lower in 2019 and 2020 due to COVID-19 pandemic.

It was surprising to know some athletes still thought the number of tests was too frequent. Although there was no significant difference on the athletes' perceived likelihood to use PES when they were tested more frequently, it is necessary to educate the athletes about the importance of conducting tests on athletes and ADOHK's test distribution plan is comply with WADC 2021.

Furthermore, suggestions to improve the Anti-Doping Administration and Management System (ADAMS) and Athlete Central app to submit whereabouts were mentioned repeatedly by some elite athletes. Both the ADAMS and Athlete Central are managed by WADA and are widely used by athletes from all over the world to submit and update their whereabouts. By improving ADAMS and the app to be more user-friendly from the athletes' perspectives not only makes it easier and more convenience for the athletes to provide accurate and up-to-date whereabouts, NADOs will also be beneficial when planning the OOC tests.

## **6. Recommendations**

WADA has emphasized on the importance of anti-doping education throughout the 2021 Code and ISE. Athletes' first experience with anti-doping should be through education, not doping tests. Base on the findings in this study, there are rooms for improvement in the current ADOHK education programs and recommendations of new initiatives to instill the values of clean sports and anti-doping rules to both athletes and athlete support personnel.

### **6.1. Educational Contents for Athletes**

The results of this study showed that in general the elite athletes in Hong Kong held negative attitudes towards the use of PES and they understood the anti-doping rules and regulations. However, there were a few athletes might consider to use PES if it was not detectable and if their teammates and opponents were also using it. As mentioned in Jalleh, et al.'s (2013) study that morality was one of the largely ignored areas in anti-doping programs. Although the majority of the elite athletes had strong moral beliefs against doping, there is still a need to emphasize on the personal morality through values-based education in order to strengthen the athletes' moral values and develop positive sports values, so that every athlete is able to make ethical and

responsible decisions when they are analyzing the cost and benefit of using a PES and not be influenced by other people's bad behaviors. ISE suggested that values-based education should begin in the early stage of athletes' career. Therefore, on top of the existing secondary school talk program, ADOHK can consider to collaborate with the Hong Kong School Sports Federations (HKSSF) and the University Sports Federation of Hong Kong, China (USFHK) who are responsible for organizing inter-school sports competitions for secondary schools and universities respectively, to organize activities and workshops for the students in school sports teams regularly to instill the spirit of sports and foster clean sport environment in their early sports life. Other than the young athletes, the values-based education component should also be included for the national- and international-level athletes to ensure their moral values are maintained throughout their career.

Athletes in this study also expressed that they would be discouraged to use PES because of the severity of doping sanctions and consequences, as well as did not want to disappoint their family members and friends. Therefore, ADOHK can explain more about the sanctions of ADRVs and emphasize on the social consequences after being caught of doping through the ISE's Anti-Doping Education component by organizing workshops, event-based education or webinars.

## 6.2. Online Learning Platform

The elite athletes in Hong Kong considered Online Learning Platform as the second most effective way to improve their anti-doping knowledge. WADA has developed and updated its Anti-Doping Education and Learning Platform (ADEL) to provide comprehensive online educational courses to athletes and athlete support personnel. Athletes not only can access the courses through ADEL website, WADA has also developed the ADEL by WADA mobile app for them to learn offline and anywhere. However, the courses in ADEL are officially in English and some of them have been translated into other languages such as French, Spanish, Japanese, etc. Since the mother language of most of the athletes in Hong Kong is Chinese so it is not easy for everyone to take the online courses in English. As a result, they may not be able to make good use of and experience the learning opportunities in ADEL. Even though ADOHK may not have sufficient resources to develop its own Chinese online learning

platform, ADEL provides translation services of the courses and support through the machine translation platform free of charge. By translating the ADEL courses into Traditional Chinese, it will be beneficial for the athletes in Hong Kong to learn and complete the courses anywhere, anytime at their own pace. Joint effort can also be sought with other Chinese-speaking NADO such as the Chinese Taipei Anti-Doping Agency to avoid duplication of effort and maximize the efficiency.

### 6.3. Anti-Doping Education for Coaches

Ntoumanis, et al.'s (2017) study presented coaches had the most influential power in affecting athletes' attitudes towards doping among other primary contact groups. WADA's (2022) study also indicated that coaches were perceived as the most influential athlete support personnel at every stage along the athlete pathway. The results from both studies indicated the importance of anti-doping education on coaches to foster athletes' anti-doping attitudes. The Hong Kong elite athletes in this study also showed the same perception as the abovementioned studies that they intended to go to their coaches first over the regulating anti-doping organizations if they had any questions regarding anti-doping, even though they did not consider discussions with coaches were an effective way to improve their anti-doping knowledge.

In view of this, not only athletes require anti-doping education but also there is a need for the coaches to be educated. It is suggested that ADOHK to first collaborate with HKSI to conduct anti-doping workshops for all coaches of the international and national level athletes with the focus to ensure they are knowledgeable of and comply with the anti-doping rules and regulations in Hong Kong as well as to know how to use their influence to nurture elite athletes' positive values and behaviors in sports, in order to fulfill the roles and responsibilities of athlete support personnel listed in the 2021 Code. Next, ADOHK can extend the workshops to the coaches of lower levels, such as the talented, potential and grassroots athletes, by coordinating with the NSAs, to ensure these coaches are equipped with sufficient anti-doping knowledge and having the right sports values to positively influence their athletes throughout different stages. Currently there are only a few NSAs would invite ADOHK to conduct anti-doping

workshops in their coach certificate courses. It is essential for all NSAs to include anti-doping education requirement for their coaches to be qualified and registered.

#### 6.4. Trainings for the Educators

The elite athletes in this study chose education talk as the most effective way to improve their anti-doping knowledge. The result indicated the importance of delivering a high-quality education talk to the athletes by ADOHK for enriching their knowledge. WADA published the “Education Professional Standard” and “Education Role Descriptor” in 2022 aimed at improving the level of knowledge, skills and competencies of the educators from anti-doping organizations for delivering education talks. In both documents, WADA emphasized on the qualifications and trainings required for the educators in order to maximize their contribution to an effective education program. Essential skills such as speaking, presenting, the ability to appropriately target communications to the audience and the ability to give and receive feedback, etc. have been listed out in the “Education Role Descriptor” where ADOHK can arrange external trainings (for example high level public speaking course) for the educators within the organization to develop and improve their soft skills in order to apply those skills in the deliverance of the talks.

#### 6.5. New Social Media Platform to Deliver Anti-Doping Information

It was suggested by some athletes to increase the accessibility of anti-doping information to athletes and the public and to include more sharing from the athletes. Although ADOHK already have its official website, YouTube channel, Facebook page and various types of educational materials, there is a demand to introduce new platform for delivering anti-doping information. The elite athletes in this study were mainly Millennials and Generation Z. Research has been conducted by the Digital Business Lab to find out the Top Social Media Platforms Used by Generation Z & Millennials in Hong Kong (18 – 40 years old) in 2022, Instagram was their most favorite and most used social media platform. It is suggested for ADOHK to create an official Instagram account to supplement the existing social media platforms to reach out more target audience by sharing anti-doping information to athletes and promoting clean sports values to the public. Social media campaigns can also be introduced to invite the elite athletes to share anti-doping messages on ADOHK’s Facebook page

and Instagram account in order to draw more attention from other athletes and the general public.

#### 6.6. Action Plan

Priority	Recommendation	Action	Lead	Resources	Time-scales	Critical Success Factors
1	Education Contents	Review the contents of current education programs.  Include any missing topics/ elements for athletes with different levels.	Assistant Manager (Education)	Human Time	Sep 2022	Effective planning of education program for different level athletes.  Commitment from different sports organizations.
2	Education for Coaches	Develop education program for coaches.  Collaborations with HKSI and NSAs to conduct workshops.	Deputy Manager (Education)	Financial Human Time	Jan 2023	Effective planning and development of education program for coaches.  Commitment of

						HKSI and NSAs.
3	Training for Educators	Arrange trainings with external organizations.	Head of Office	Financial Human Time	Dec 2022	Cooperation with professional training institutes.  Commitment of ADOHK.
4	Online Learning Platform	Translate ADEL courses into Traditional Chinese.	Assistant Manager (Education)	Human Time	Apr 2023	Commitment of ADOHK.
5	New Social Media Platform	Create new Instagram account.  Develop contents and campaigns.	Assistant Manager (Liaison)	Human Time	Jan 2023	Creative content development and planning.  Commitment of ADOHK.

## 7. Conclusion

The study showed that the elite athletes in Hong Kong were generally against doping in sports and had sufficient knowledge about anti-doping rules and regulations in Hong Kong. There were opposite perceptions of the doping situation in Hong Kong among the elite athletes where around 40% of them did not think doping is a serious problem in Hong Kong while almost 35% perceived the opposite. Even though the majority of them supported the Anti-Doping Rules were fair and just to protect clean athletes, they

had suggested many different ways to improve the anti-doping system in Hong Kong. The study also showed that the factors of personal morality (knowing the PES may not be detectable) and reference groups (knowing their teammates and opponents' use of PES) had a small impact on affecting the elite athletes' behaviors and attitudes towards the use of PES. Although the impact was not significant, ADOHK should enrich its education programs by bringing attention to morality and sports values in order to foster athletes' ethical behaviors. The findings in this study also suggested that education for coaches was necessary since the athletes trusted them the most when there were any anti-doping matters. Therefore, it would be beneficial to the athletes if the coaches were knowledgeable of the rules.

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## Appendices

### Appendix 1:

#### Survey Questions in Chinese and English sent to the Elite Athletes

香港精英運動員對運動禁藥管制的看法

Anti-Doping Perception of Elite Athletes in Hong Kong

你於問卷內的所有回覆都會保密並只會用作完成論文用途。

**All of your responses will be kept confidential and solely be used for the purpose of the project. Thank you for your participation.**

\* 1. 當你遇到關於運動禁藥管制的問題，你第一個會詢問的人是？

Whom will be the first person you turn to if you have any questions regarding anti-doping?

- ☐ 教練 / Coach
- ☐ 醫生 / Doctor
- ☐ 隊友 / Teammates
- ☐ 朋友 / Friends
- ☐ 其他（請註明）  
Other (please specify)

\* 2. 香港運動禁藥管制

Anti-Doping in Hong Kong

完全不同意 /  
Strongly Disagree

不同意 /  
Disagree

沒意見 / Neither  
Agree nor  
Disagree

同意 / Agree

完全同意 /  
Strongly Agree

我完全明白香港的運動禁藥管制規條及政策。 I fully understand the Anti-Doping Rules & Regulations in Hong Kong.

☐
☐
☐
☐
☐

使用運動禁藥在體育界是完全不能接受的行為。 Doping is totally unacceptable in sports.

☐
☐
☐
☐
☐

我認為運動禁藥管制規條對保護清白運動員是公平公正的。 I think the Anti-Doping Rules are fair and just to protect clean athletes.

☐
☐
☐
☐
☐

使用運動禁藥在香港是一個嚴重的問題。 Doping is a serious problem in Hong Kong.

☐
☐
☐
☐
☐

運動成績超卓的運動員一定曾經使用過某些運動禁藥。 Athletes with excellent sports results must be using some sort of performance enhancing substance.

☐
☐
☐
☐
☐

\* 3. 運動禁藥

Doping in sports

完全不同意 /  
Strongly Disagree

不同意 /  
Disagree

沒意見 / Neither  
Agree nor  
Disagree

同意 / Agree

完全同意 /  
Strongly Agree

如果某種運動禁藥不  
會被檢測得到，會提  
升我使用該運動禁藥  
的可 能。

I will be more likely to  
use a performance  
enhancing substance  
if it is not detectable.

☐
☐
☐
☐
☐

如果知道我的隊友及  
比賽對手都有使用運  
動禁藥，會提升我使  
用運動禁藥的可能。

I will be more likely to  
use a performance  
enhancing substance  
if I know my  
teammates and  
opponents are also  
using it.

☐
☐
☐
☐
☐

服用運動禁藥的後果及  
懲罰的嚴重性足以阻止  
我不會使用運動禁藥。

The consequences  
and sanctions of  
doping are punitive  
enough to  
discourage me from  
using any  
performance  
enhancing substance.

☐
☐
☐
☐
☐

我絕對不會使用運動  
禁藥，因為我不想令  
家人及朋友失望。

I will never use a  
performance  
enhancing  
substance because I  
do not want to  
disappoint my family  
members and  
friends.

☐
☐
☐
☐
☐

如果我接受禁藥檢測的  
次數增加，會減低我使  
用運動禁藥的可能。

I will be less likely to  
use a performance  
enhancing substance  
if I am tested more  
frequently.

☐
☐
☐
☐
☐

\* 4. 哪一項是對你提升運動禁藥管制知識最有效的方法？

What is the most effective way for you to improve your anti-doping knowledge?

- ☐ 講座 / Talk
- ☐ 與教練討論 / Discussions with coaches
- ☐ 網上學習平台 / Online Learning Platform
- ☐ 教育教材，如小冊子、季刊等 / Educational Materials, e.g. pamphlets, newsletters, etc.

5. 你認為現時的運動禁藥管制體系有什麼地方可以改善？

What do you think can be improved in the anti-doping system?

\* 6. 你的性別 / Your gender

- ☐ 男 / Male
- ☐ 女 / Female

\* 7. 你的年齡 / Your age

- ☐ 15 - 20
- ☐ 21 - 25
- ☐ 26 - 30
- ☐ 31 - 35
- ☐ 36 或以上 / 36 or above

\* 8. 你的運動項目 / Your sport

## **Appendix 2:**

### **Invitation email sent to the Elite Athlete to participate in the survey**

**Subject:** Survey on Anti-Doping Perception

Dear Athlete,

I am writing to invite you to participate in a survey on anti-doping perception.

I am currently studying the Executive Masters in Sport Organisations Management supported by the International Olympic Committee. The topic of my final project is “Anti-Doping Perceptions of the Elite Athletes in Hong Kong”. Your response in the survey is an essential part to complete my project.

The survey is very brief and will only take less than 5 minutes to complete. All of your responses will be kept confidential and solely be used for the purpose of the project.

Please click the link below to go to the survey website:

<https://www.surveymonkey.ca/r/LTGD6RK>

Thank you very much for your time and cooperation.

Best Regards,

Michelle TAO