

**A Survey on Drug Usage Among Hong
Kong Elite Athletes - Opinion,
Understanding and Practice**

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ABSTRACT

This study investigates the opinion, understanding and practice of doping in the local sporting community. There was a total of 99 Hong Kong elite athletes (56 males and 43 females) responded to this survey. All subjects were requested to complete a questionnaire on opinion on the meaning of competition and the fairness of international competition; attitude and understanding on doping; and practice on ergogenic aids. The questionnaires were sent out under two occasions: (1) in early 1994 and (2) three months before the 1994 Commonwealth Games.

There was no significant difference in the data collected between male and female athletes, between athletes in skilled orientated and those in power orientated sports. Local elite athletes in general had a positive view on their attitude towards competition. Although more than half (65.7%) of the subjects reported that gold medal is the ultimate goal for their participation in a competition, majority of them (85.9%) stated that the aim of competition is to test one's own personal limits against other athletes. Almost all of the subjects (93.9%) reported that they will never take drugs banned by IOC in order to get improvement to their performance. In general, the Hong Kong elite athletes do not have strong confidence in the fairness of competition. One third (31.3%) of subjects felt that international competition is no more a fair game. Only 53.6% claimed that it is still fair. Most of them (63.6%) stated that there is a lot of athletes who have taken drugs or used other illegal ergogenic aids but was not discovered. Local elite athletes will no longer put faith in the doping system if the situation get worse. The knowledge of Hong Kong athletes in doping is in general poor. This put our athletes in danger of being tested positive through ignorance. For instance, 61.1% of the subjects never actively ask their physicians to avoid using banned drug / medicine.

There is a need to emphasize the importance of out-of-competition testing and using banned substances during training still bears the same risk of being tested positive in doping control, compared with using banned substances during competition. Athletes right before major game put more emphasis on the fairness of competition when compared to those were long before any major competition. They also tend to have a greater awareness to other side effects of doping apart from addiction. It is therefore suggested that education is especially effective right before major game as athletes are more likely to accept the importance of staying clean in order to ensure a fair game. Experienced athletes are more likely to actively inform their physicians to avoid using banned drug / medicine during consultation. Education for the less experienced athletes will be particularly important. Since poor knowledge in doping together with the lack of attention paid on over-the-counter medicine put these athletes under high risk of being tested positive.

The present survey shows that local athletes on average do not have a clear picture on both legal / illegal ergogenic aids and doping control system. In order to keep the local athletes away from illegal ergogenic aids, a tailored-make education program in doping control is needed. In order to be cost effective, it should be focused on the less experienced athletes and athletes who are about to compete in major game. It should provide local athletes with education in order to put faith in the doping control system and to believe in the fairness of international competition.

METHODS

Subjects

All subjects involved in the study are either Hong Kong team athletes or scholarship athletes in Hong Kong. A total of 99 athletes (56 men and 43 women) responded to the survey. They represent 16 different sports namely, badminton, cycling, fencing, gymnastics, judo, lawnbowls, rowing, shooting, soccer, squash, swimming, tennis, track & field, triathlon, windsurfing and wushu (Figure 1). These 16 different sports can be classified into two main groups: skilled orientated and power orientated. Of the 99 subjects, 64 of them take part in skilled orientated sports while the other 35 take part in power orientated sports (Figure 2). The average year of experience in their corresponding sports is 8.14 (SD = 5.64), with minimum 1 year and maximum 33 years. Their international competition experience is 4 years on average (SD = 4.21), ranged from no experience to maximum 30 years.

Questionnaires were sent out under two occasions: (1) in early 1994 and (2) three months before the 1994 Commonwealth Games. Group 1 refers to athletes who completed the questionnaire in occasion 1 and were not under the immediate pressure of any major games. Group 2 refers to athlete who completed the questionnaire in occasion 2 and were going to compete in major game in the near future. A summary of the demographic characteristics of Group 1 and Group 2 were presented in Table 1, as well as Figure 1 and Figure 2.

Figure 1. Distribution of 16 Different Type of Sports Represented by the Subject Group

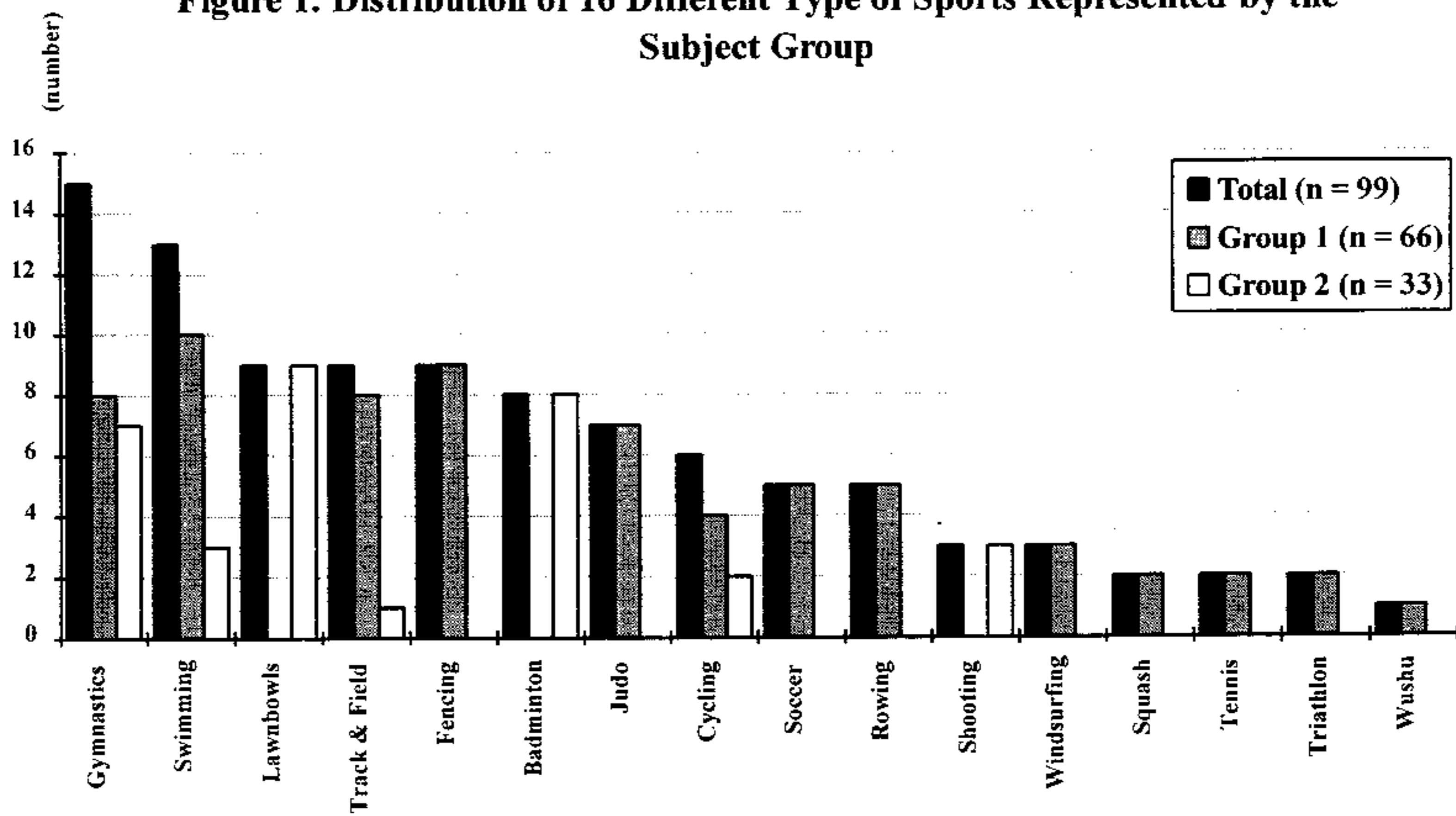


Figure 2. Distribution of Skilled Orientated and Power Orientated Sport

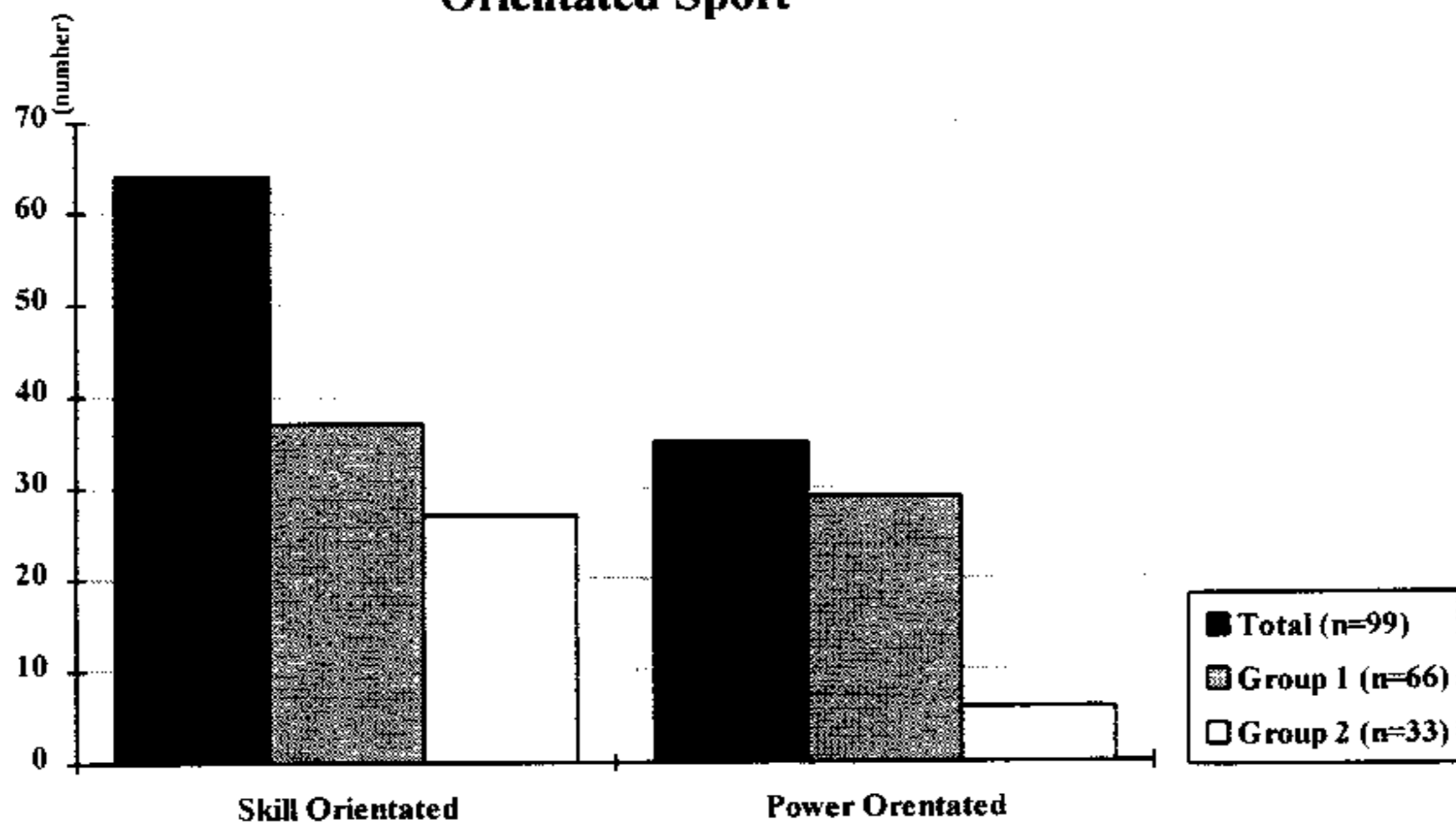


Table 1. Demographics of Hong Kong Elite Athletes Responding to Surveys of Drug Usage

	<u>Total (n = 99)</u>	<u>Group 1 (n = 66)</u> <u>Long Before Any</u> <u>Competition</u>	<u>Group 2 (n = 33)</u> <u>Just Before</u> <u>Competition</u>
<u>Gender</u>			
Male	56	40	15
Female	43	26	18
<u>Year of Experience Involve In The Sport</u>			
Mean	8.14	6.42	11.58
SD	5.64	3.82	7.05
minimum	1	1	2
maximum	33	22	33
Less experience (≤ 7 yr.)	51 (51.5%)	44 (66.7%)	7 (21.2%)
Experienced (> 7 yr.)	48 (48.5%)	22 (33.3%)	26 (78.8%)
<u>Year of Experience In International Competition</u>			
Mean	3.98	3.02	5.91
SD	4.21	2.65	5.86
minimum	0	0	0
maximum	30	9	30
Less experience (≤ 3 yr.)	51 (51.5%)	38 (57.6%)	13 (39.4%)
Experienced (> 3 yr.)	48 (48.5%)	28 (42.4%)	20 (60.6%)

Questionnaire

A questionnaire used for data collection was designed in October 1993. The initial design was based on an one-to-one personal interview between one of the investigators and seven randomly selected scholarship athletes from different sports. A list of open-end questions concerning athlete's opinion, understanding, and practice of using ergogenic aids were asked. A pilot study was conducted to refine the draft questionnaire. Eight invited scholarship athletes were divided into two groups of four to complete the draft questionnaire in the presence of the author. The group interview aimed to acquire comments on the questionnaire. The draft was then modified according to the identified needs. The major modification was the inclusion of a Chinese version of the questionnaire.

The modified questionnaire consists of six parts. The first part tackles demographic data like gender, sports type, year of experience, etc. The rest of the questions aim to elucidate (1) opinion on the meaning of competition to the athlete; (2) opinion on the fairness of international competition; (3) attitude toward doping; (4) understanding on doping; and (5) practice on ergogenic aids. Most of the questions require responses according to a 5-point Likert type scale. The choice of 'Yes', 'No' and 'No idea' are given when the Likert type scale is not suitable. (Appendix I)

Data Collection

The study was divided into two parts. The first part was conducted in early 1994. Questionnaires were administered to all scholarship athletes in Hong Kong. A total of 90 questionnaires were completed and returned by the athletes on voluntary basis. The analysis of this part, however, was based on the information provided by 66 respondents as 24 of the returned questionnaires were nullified upon incompleteness.

The second part was conducted three months before the 1994 Commonwealth Games. A total of 48 elite athletes who represented Hong Kong in the Games returned the questionnaires. Fifteen of them were found to be incomplete and there were only 33 questionnaires for data analysis in the second part.

Data Analysis

All the questionnaire responses were coded, verified, and keypunched. By using the computer software SPSS (Statistical Package for the Social Sciences), frequency counts, percentages, means (\bar{x}), standard deviation (SD), and additional statistical analysis were computed. Mann-Whitney U test was used to test for any significant difference between groups. Statistical significance was set at $p < 0.05$ in this study.

RESULTS

Overall

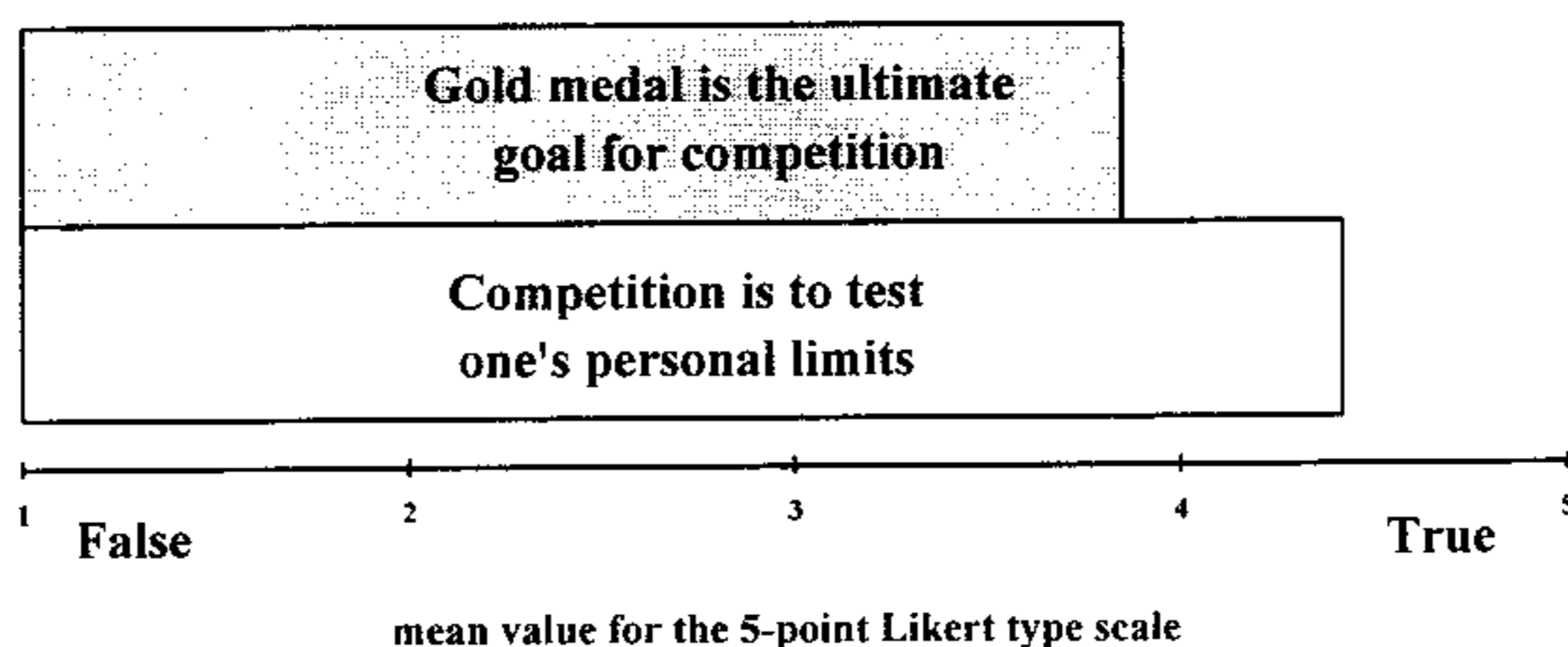
When questionnaires collected under both occasions were pooled and analyzed, the following results were obtained.

It was discovered that there was no significant difference in the data collected between male and female athletes. For different type of sport, skilled orientated and power orientated sports, it was also found that no significant difference in the data collected between them.

Meaning of Competition

65.7 percent of the subjects (who chose 4 & 5 in the 5 Likert scale) reported that gold medal is the ultimate goal for their participation in a competition. At the same time, more than 80 percent (85.9%) of them (who chose 4 & 5 in the 5 Likert scale) stated that the aim of competition is to test one's own personal limits against other athletes. Figure 3 summarized the general result towards the meaning of competition among local athletes.

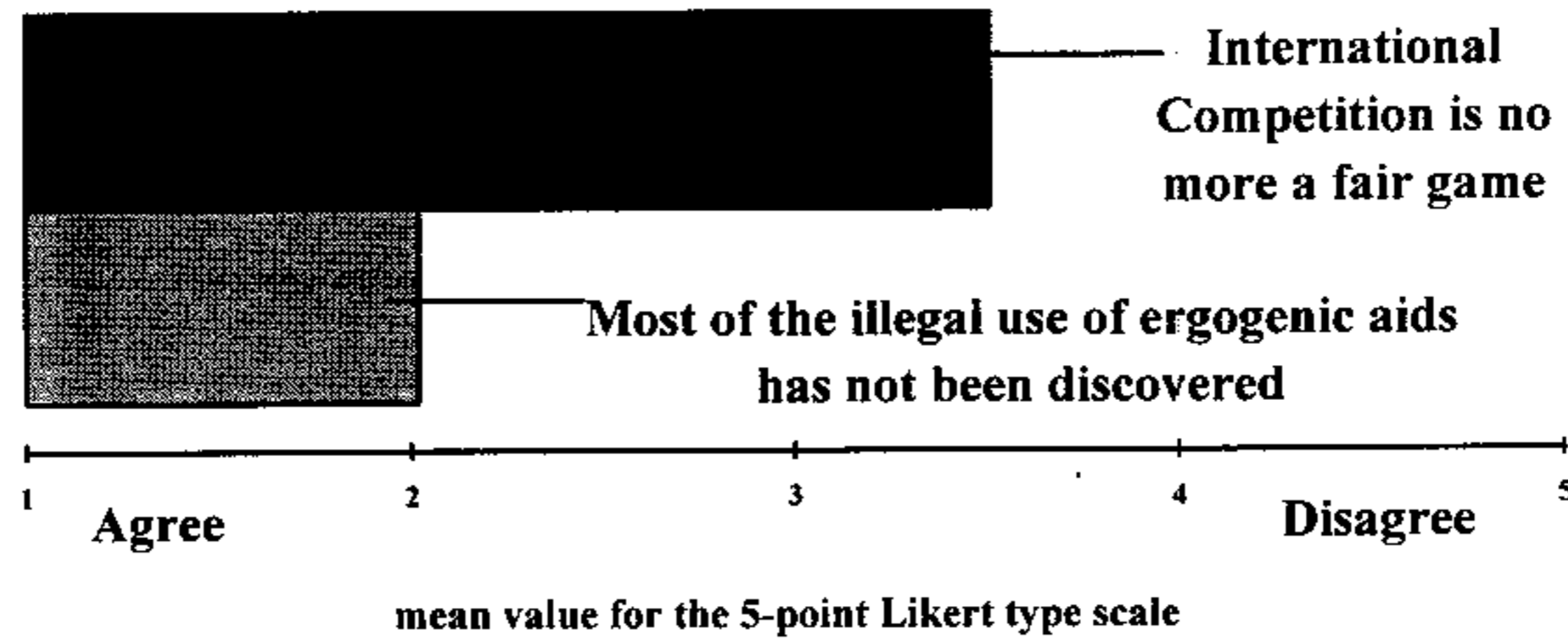
Figure 3. Meaning of Competition



Opinion on International Competition

Quite a large portion of the subjects (31.3%, who chose 1 & 2 in the 5 Likert scale) felt that international competition is no more a fair game. Only half of them (53.6%, who chose 4 & 5 in the 5 Likert scale) claimed that it is still fair. Over half of the subjects (63.6%, who chose 1 & 2 in the 5 Likert scale) stated that there is a lot of athletes who have taken drugs or used other illegal ergogenic aids but was not discovered. (Figure 4)

Figure 4. Opinion on International Competition

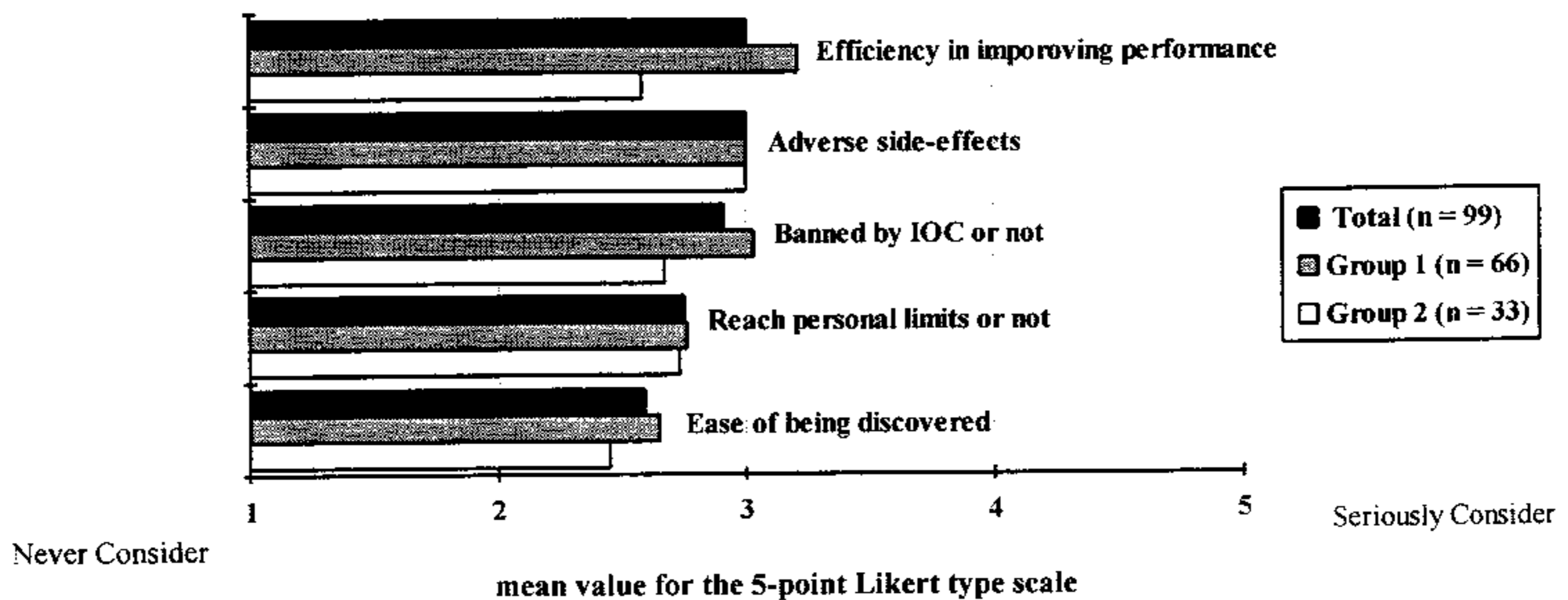


Attitude towards Use of Ergogenic Aids

Subjects in the study strongly claimed that they will never use banned drugs / methods to enhance their performance. Since a high percentage, 93.9%, of the subjects (who chose 5 in the 5 Likert scale) reported that they will never take drugs banned by IOC in order to get improvement to their performance.

Figure 5 shows the criteria used by the athletes in choosing the use of a particular ergogenic aids in their order of importance. The adverse side-effect of the ergogenic aid and effectiveness of the ergogenic aid in improving athletes' performance in their sport will be factors they considered more in choosing a particular ergogenic aid. Other factors, like whether the ergogenic aid is banned by IOC or not, whether his / hers level of performance has reached personal limit or not, whether the use of the ergogenic aid will be discovered by IOC or not will be considered less.

Figure 5. Criteria Used in Choosing a Particular Ergogenic Aids



Understanding on Doping

The athletes' knowledge and information on doping come from various sources. The order of significance of the sources was: (1) mass media, (2) books, (3) coach, (4) teammates, and (5) friends made during international competition (Figure 6).

Figure 6. Source of Information about Doping

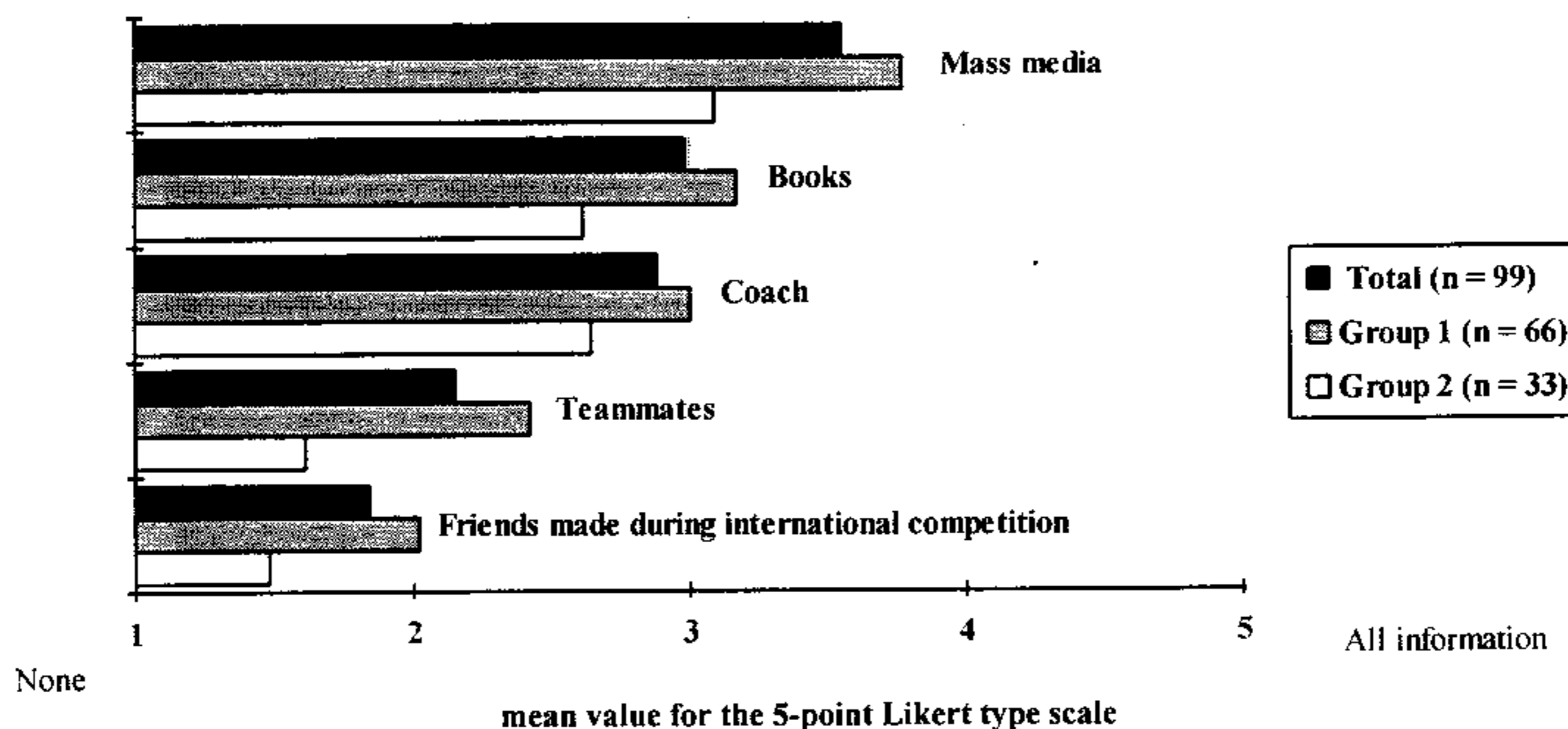


Figure 7 showed the opinion of the local athletes on the possible side effects of drugs used in doping. Most of the side effects were not considered as strongly possible or strongly impossible. However, addiction was in general considered to be a prone side effect as a result of doping.

Figure 7. Opinion on Possible side Effects of Drugs Used in Doping

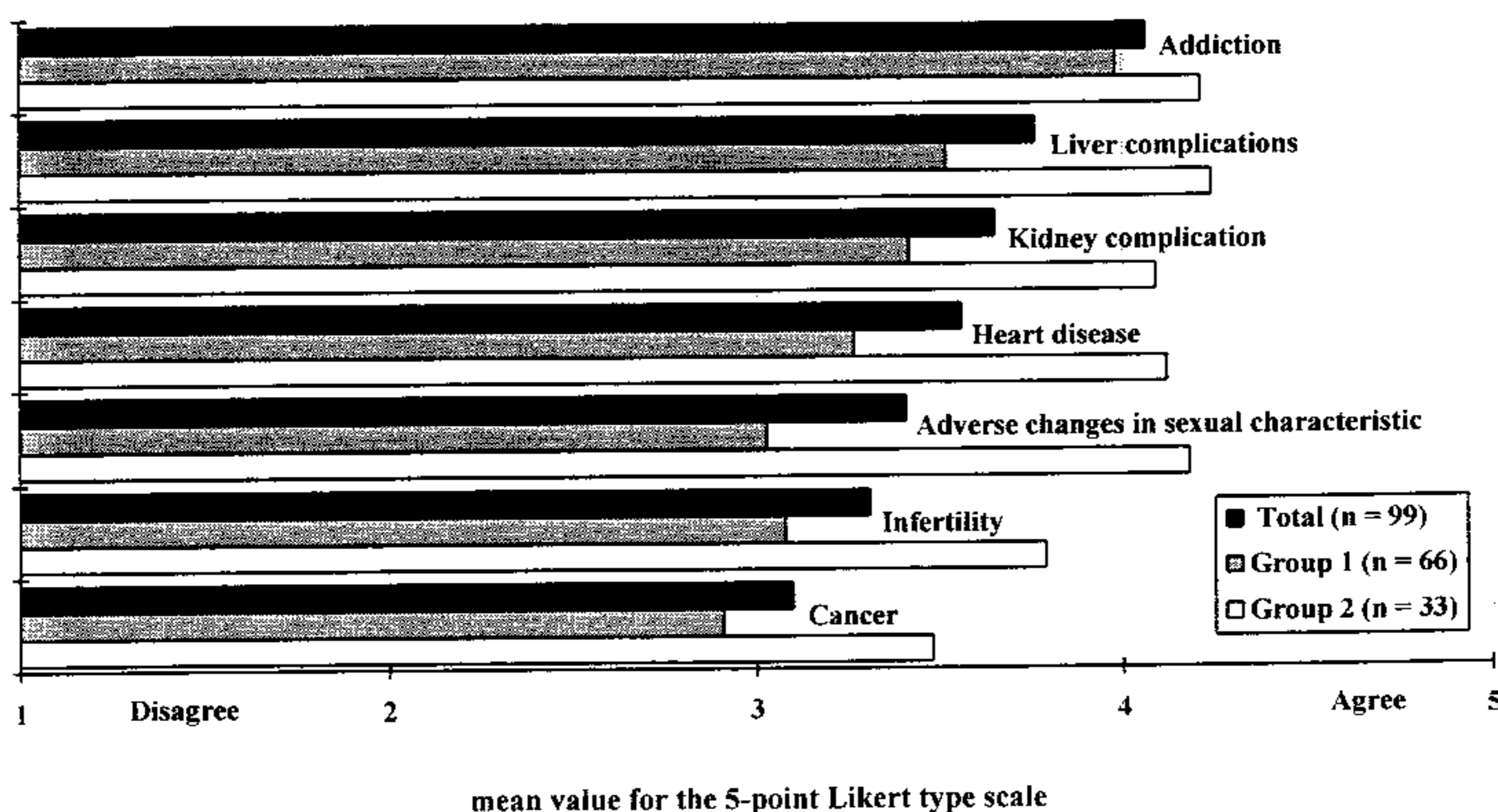


Table 2 indicated the percentage of correct and incorrect answers given by the local elite athletes on questions upon selected areas of doping. Average results were attained in the area of “situation that athletes may be selected for doping control” and “sample collected for doping control”. Poor result was obtained in the area of “risk of using over-the-counter medicine”. There was only 27.3% of the subjects got the correct answer. 70% of them even got no idea about that. In addition, half of the subjects (53.6%) believed that it is possible to be tested positive in doping control even though drug for enhancing performance was not taken explicitly.

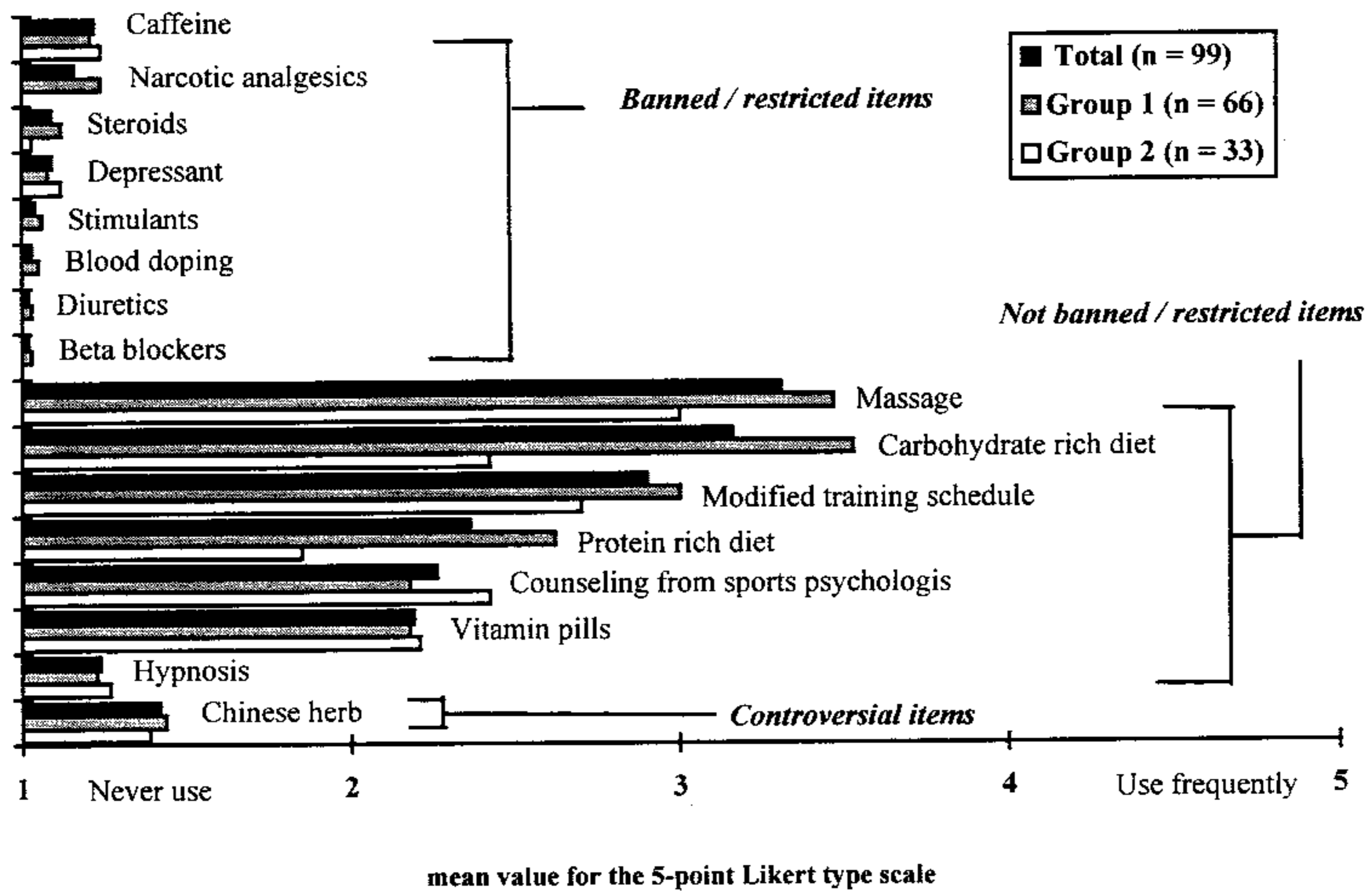
Table 2. Knowledge of Local Elite Athletes on Doping

Knowledge	<u>Correct answer</u> (%)	<u>Incorrect answer</u> (%)	<u>No idea</u> (%)
Situation that athletes may be selected for doping control	63	13.5	23.5
Sample collected for doping control	44.4	19.9	35.7
Risk of using over-the-counter medicine	27.3	2.0	70.7

Practice of Ergogenic Aids

The experience of local elite athletes on using various ergogenic aids was shown in Figure 8. The banned / restricted items were never used to a significant extent. The order of frequency, from high to low, of using the not banned / restricted methods were: massage, carbohydrate rich diet, modified training schedule, protein rich diet, psychotherapy and hypnosis. The controversial item, Chinese herbs, was not used extensively as shown. Moreover, local elite athletes showed little tendency to actively ask their physicians to avoid using banned drug / medicine. More than half of the subjects (61.6%, who chose 1 & 2 in the 5 Likert scale) never inform their doctor that they are athletes in order to avoid any IOC banned drug / medicine being prescribed.

Figure 8. Practice on Doping



Group 1 versus Group 2

One of the questions in the questionnaire asked the opinion whether subjects sympathize with athletes who has been punished for taking drugs to enhance performance. A significant difference was obtained between Group 1 and Group 2 ($p < 0.05$). Most of the subjects in Group 2 (81.8%, who chose 4 & 5 in the 5 Likert scale), athletes right before competition, do not sympathize with those who has been punished for doping. On the other hand, athletes who are not going to compete in major games in the near future, Group 1, did not have strong sympathy with the illegal act.

In choosing a particular ergogenic aid, subjects in Group 1 considered more in effectiveness of the ergogenic aid in improving athletes' performance in their sport and whether it is banned by IOC or not. However, the adverse side-effect of the ergogenic aid and whether his / hers level of performance has reached personal limit or not will be factors for subjects in Group 2 considered more in choosing a particular ergogenic aid. The choice, whether the use of the ergogenic aid will be discovered by IOC or not, was being considered least by both Group 1 and 2 (Figure 5).

Addiction is, in general, the most well known side effect of doping. However, right before competition (Group 2), athletes tend to have a greater awareness to other side effects apart from addiction (Figure 7). In comparison, the frequency of using ergogenic aids was lower

on average for athletes right before competition than long before competition. Right before competition athletes were more firm in not using any banned / restricted items (Figure 8).

Experienced versus Less Experienced

Experienced athletes, in this study, were defined as athletes involved more than seven years in the corresponding sport (n = 48). Those with experience less than or equal to seven years were defined as less experienced athletes (n = 51).

Similarly, experienced in international competition athletes were defined as athletes involved more than three years in international competition (n = 48). Those with experience less than or equal to three years were defined as less experienced athletes in international competition (n = 51).

By using a Pearson product moment correlation test on the data, the resulted correlation coefficient, r, is +0.785. This indicated that there is a positive correlation between the year of experience involve in the corresponding sport and the year of experience in international competition, such that the more experience the athlete involve in the corresponding sport, the more experience he / she in international competition.

In general, there was not much significant difference between the experienced and the less experienced athletes. One of the significant difference was that experienced athletes are more likely to actively inform their physicians to avoid using banned drug / medicine during consultation (experienced athletes: 25% (who chose 5 in the 5 Likert scale), less experienced athletes: 9.8% (who chose 5 in the 5 Likert scale)). Moreover, higher percentage of experienced athletes got correct answer in the area of "risk of using over-the-counter medicine" than those less experienced (experienced athletes: 33.3%, less experienced athletes: 21.6%).

DISCUSSION

Local elite athletes on average had a positive view on their attitude towards competition. They have the stronger belief that to compete is to test one's own personal limits (4.42 ± 1.03 where 1 = false, 5 = true) rather than to get a gold medal (3.85 ± 1.45). This attitude should enable the Hong Kong athletes to be able to stand firm against using banned substances in enhancing performance. This is supported by the low frequency of using banned substances as indicated in the present finding. However, when sporting excellence is tagged onto commercialism, an alternative attitude is likely to be adopted by the local fraternity. Education will be a mean of precaution in this aspect.

The local elite athletes to a certain extent began to doubt the fairness of international competition (3.51 ± 1.60 where 1 = no more fair, 5 = still fair). Athletes even complained about using of illegal ergogenic aids was not discovered (2.02 ± 1.30 where 1 = agree, 5 = disagree). There had been a decrease of confidence in fair game, local elite athletes will no longer put faith in the doping system if the situation get worse.

In this study, the Hong Kong elite athletes claimed that they seldom use banned or restricted items in order to enhance their performance (Figure 8). Most of them strongly claimed that they will never take any banned drugs / methods (4.83 ± 0.71 where 1 = often take, 5 = never take). On the other hand, the use of legal ergogenic aids, such as massage, carbohydrate / protein rich diet, modified training schedule, etc., is common for the Hong Kong athletes (Figure 8).

The controversial item, Chinese herbs, was not used extensively by the local athletes (1.42 ± 1.04 where 1 = never use, 5 = often use). However, the risk involved in using Chinese herbs should not be ignored. It is partially because of the unknown chemical composition of most of the Chinese herbs. One will never be certain that banned substances are not present in the herb. In addition, the tradition of using Chinese herbs to treat certain disease or metabolic imbalance is well established in a Chinese population like that in Hong Kong, athletes living in such culture will have great tendency to use Chinese herbs under influence. The possible risk of using banned substances by ignorance will be much reduced if athletes are educated to avoid using Chinese herbs of unknown chemical composition.

According to the result of this study, coaches and teammates are not the most important source of information on ergogenic aids (2.88 ± 1.77 ; 2.15 ± 1.61 respectively where 1 = none, 5 = get all information). Instead, mass media is the number one source of information (3.55 ± 1.69). However, information from mass media may not show a complete picture and may even be wrong and misleading. Mis-information murmured around the sporting community may inadvertently lead to erroneous behavior so that an explicit discussion will only benefit the "health" of the local fraternity. We are therefore convinced that education on doping should be integrated in the training for both coaches,

athletes and even sports administrators, only in this way the correct and complete picture of ergogenic substances can reach the athletes.

There was no significant difference in the data collected between male and female athletes, skilled orientated and power orientated sports. It indicated that the opinion, understanding and practice on performance enhancing drugs is sex-independent and also independent of the nature of sport.

The data from this study indicated that athletes right before major game put more emphasis on the fairness of competition when compared to those were long before any major competition (Group 1: 3.48 ± 1.76 , Group 2: 4.33 ± 1.11 , where 1 = sympathize with those were punished for doping, 5 = not sympathize with punishment). To play fair during international competition is of great importance to them when the time is close to major game. Consequently, education is especially effective right before major game as athletes are more likely to accept the importance of staying clean in order to ensure a fair game.

Athletes before major game tended to avoid any illegal act and the corresponding punishment as their frequency in using ergogenic aids decreased (Figure 8). This finding reviews the potential problem of using illegal ergogenic aids during training, as most Hong Kong athletes do not aware the existence of out-of-competition doping control. There is a need to emphasize the importance of out-of-competition testing and using banned substances during training still bears the same risk of being tested positive in doping control.

Another important finding in this survey is that the less experienced athletes (≤ 7 years experience in sports) tend to ignore the importance of avoiding banned substances. These athletes seldom actively discuss with their physicians to avoid any IOC banned drug (experienced athletes: 2.52 ± 1.70 ; less experienced athletes: 1.92 ± 1.47 where 1 = never discuss, 5 = always discuss). This may especially increase the possible risk of using banned substances by ignorance. Very few of these athletes can identify the classification of drugs, the pharmaceutical actions or possible side effects, the validity of the claims of these ergogenic agents and the serious implication of being detected positive during competition or training. The poor knowledge in doping together with the lack of attention paid on over-the-counter medicine and Chinese herbs, and the ignorance of the importance of actively avoiding banned substances put these athletes under high risk of being tested positive. This implied that education for the less experienced athletes will be particularly important.

CONCLUSION

The Hong Kong elite athletes strongly claimed that they seldom use banned or restricted items in order to enhance their performance. However, the discovery of usage of illegal ergogenic aids both during competition and out-of-competition is increasing. In order to keep the local athletes away from illegal ergogenic aids, a tailored-make education program in doping control is needed. On the other hand, it should provide local athletes with education in order to put faith in the doping control system and to believe in the fairness of international competition.

According to the findings of this study, local athletes on average do not have a clear picture on both legal / illegal ergogenic aids and doping control system. The tailored-make education program should be focused on the less experienced athletes and athletes before major game in the near future. Apart from educating local athletes, education on doping should also provide to coaches, sports administrators, etc., as athletes are under their influence indirectly.

Appendix I

**Drug usage among local athletes -
opinion, understanding, & practice**

This is a questionnaire for the survey on drug usage among local athletes conducted by the Hong Kong Centre of Sports Medicine and Sports Science, the Chinese University of Hong Kong. Please return the completed questionnaire by October 26, 1992 to:

Miss Katherine Siu
Sports Medicine Department
Hong Kong Sports Institute
Shatin, N.T.

Personal particulars

Sex: _____

Sports: _____ Event/position (if applicable): _____

Years of experience in the sports: _____

Years of experience in international competition: _____

Useful definition

*Ergogenic aids: any drug or method that is used by athletes to enhance performance or speed up recovery from heavy training

**Beta blocker: a drug which decreases the heart's activity, thus help to calm down a person

***Blood doping: a practice of removing blood from the athlete at about 3 weeks before competition, the blood is then reinfused into the athlete later. This is believed that this method can enhance performance by improving oxygen carrying capacity of the athlete.

Questionnaire (Put a '✓' at the appropriate box)

1. A gold medal is the ultimate goal for my participation in a competition.
2. I participate in a competition in order to test my own personal limits against other athletes.
3. International competition is no more a fair game as a lot of athletes are using ergogenic aids* to enhance their performance.
4. I will never take drugs banned by IOC to enhance my performance.
5. I sympathize with athletes who has been punished for taking drugs to enhance performance.
6. There is a lot of athletes who have taken drugs or used other illegal ergogenic aids* but was not discovered.

True	False
<input type="checkbox"/>	<input type="checkbox"/>
True	False
<input type="checkbox"/>	<input type="checkbox"/>
True	False
<input type="checkbox"/>	<input type="checkbox"/>
True	False
<input type="checkbox"/>	<input type="checkbox"/>
True	False
<input type="checkbox"/>	<input type="checkbox"/>

d) how effective the ergogenic aid* is in improving my performance in my sport

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e) whether my level of performance has reached my personal limit or not

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11. The possible side effects of using drugs to enhance performance or speed up recovery from heavy training are

Agree Disagree

a) addiction

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b) adverse changes in sexual characteristics

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c) infertility

--	--	--	--	--

d) liver complications

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e) kidney complications

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f) cancers

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g) heart disease

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12. Athletes may be selected for doping control procedures under the following situations:

Yes No No idea

a) during international competition when the athletes win a medal

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b) during international competition, independent of the performance of the athletes

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c) anytime during the athlete's sports career

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13. The IOC doping control procedure requests athletes to provide:

Yes No No idea

a) urine sample

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b) blood sample

--	--	--

c) both urine and blood sample

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14. It is possible for an athlete to be tested positive in doping control even though the athlete did not take drug explicitly for enhancing performance (assuming no error make in the laboratory).

Very possible Very unlikely

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15. I always inform my doctor that I am an athlete and ask the doctor to avoid prescribing any IOC banned drug/medicine.

Always Never

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本港運動員對藥物的意見、認識及習慣

本問卷調查由隸屬香港中文大學的香港運動醫學及科學研究中心籌劃，目的在於了解本港運動員在藥物應用上的情況。

個人資料：

年齡：_____

性別：_____ 所參與之運動：_____

主要項目或類別(如適用)：_____

參與該運動之時間：_____年 參加國際比賽之經驗：_____年

詞句定義：

* 增強體能方法 (Ergogenic Aids)：任何能加強運動員的表現或加速艱苦訓練後的體力恢復的藥物或方法。

** Beta Blocker：一種可以減慢心跳，從而有鎮定作用的藥物。

*** 血摺 (Blood Doping)：在運動員參賽前約三星期抽出幾品脫的血，最後再把先前抽出的血輸回體內，據信用此方法能增加運動員的血細胞數目，並改替供氣能力。

問卷：(請在適當的空格上加上'√'號)

- 1. 我參加比賽的最終目的是贏取金牌。 是 否
- 2. 我參加比賽是為了向自己及他人的極限挑戰。 是 否
- 3. 國際性的運動比賽已無公平可言，因為很多運動員都利用"增強體能方法" (Ergogenic Aids)*去加強表現。 是 否
- 4. 我永遠不會利用違禁藥物去加強運動表現。 是 否
- 5. 對於利用藥物去加強運動表現而被罰的運動員我深表同情。 是 否
- 6. 尚有很多利用違禁藥物的運動員還未遭揭發。 是 否
- 7. 關於"增強體能方法" (Ergogenic Aids)*的資料，我是從下列途徑獲得： 是 否
 - a) 教練
 - b) 隊友
 - c) 大眾傳播媒介，例如報章、雜誌、電視.....等
 - d) 在國際比賽中認識的朋友
 - e) 尋本
- 8. 為了加強我的運動表現和/或加速艱苦訓練後的體力恢復，我曾使用： 經常 從未
 - a) 按摩
 - b) 中醫草藥
 - c) 高蛋白飲食
 - d) 高碳水化合物飲食

