

ORIGINAL RESEARCH

Effect of athletes' ethical sensitivity on doping mindset and tendency: moderated by sex and age

Hyo-Jun Yun¹, Jae-Hyeon Park¹, Hyeri Oh^{2,*}, Minsoo Jeon^{3,*}

¹Center for Sports and Performance Analysis, Korea National Sport University, 05541 Seoul, Republic of Korea

²Department of Physical Education, Korea National Sport University, 05541 Seoul, Republic of Korea

³Department of International Sport, Dankook University, 31116 Chungcheongnam-do, Republic of Korea

***Correspondence**

minsoo1144@dankook.ac.kr

(Minsoo Jeon);

simbi0430@naver.com

(Hyeri Oh)

Abstract

It is essential to check athletes' mindset and tendency toward doping to prevent it. This study aimed to determine the effect of athletes' ethical sensitivity on their mindset and tendency toward doping, and whether age and sex have a moderating effect. To achieve the purpose of this study, 1003 athletes registered in the Korea Sports Association were surveyed with a questionnaire consisting of 34 questions including ethical sensitivity items and a Performance Enhancement Attitude Scale (PEAS). To verify the reliability and validity of the data, an Item Response Theory (IRT)-based Rasch model was applied. Consequently, we deleted three questions from ethical sensitivity and five questions from PEAS. Our results are as follows: First, ethical sensitivity showed differences according to sex, and mindset and tendency toward doping showed differences according to age. Second, ethical sensitivity was found to have a statistically significant effect on mindset and tendency toward doping. Third, regarding the effect of ethical sensitivity on their mindset and tendency toward doping, the moderating effect of sex and age was not found to have a statistically significant effect. Our findings confirmed that ethical sensitivity has a positive relationship with the mindset and tendency toward doping. In other words, improving the ethical sensitivity of athletes will increase their ethical awareness and help prevent unethical behavior such as doping.

Keywords

Athletes; Ethical sensitivity; PEAS (Performance Enhancement Attitude Scale); Doping mindset; Doping tendency; Moderating effect

1. Introduction

Ethical sensitivity refers to the ability to recognize ethical problems in a particular situation and to determine possible alternatives by interpreting the situation [1]. According to Wittmer [2], who proposed an ethical decision-making behavioral model, ethical sensitivity (the ability to identify ethical issues) should be considered first when an individual is faced with an ethical problem, meaning that ethical sensitivity can be a key indicator of ethical decision-making. In fact, several previous studies have reported that the higher the ethical sensitivity, the more ethical decision-making [3–7]. This accounts for the active use of ethical sensitivity variables in research in various fields where individual ethical awareness is important.

In sports competitions based on integrity and fairness, match-fixing, doping, violence, and retaliatory fouls are forms of cheating from which athletes are obligated to refrain. This is known as the ethics or ethicality of athletes [8]. The test tool developed by Choi [8] can be introduced as a method to measure the ethical sensitivity of athletes. This test consists of 12 questions on acts, arrangements, and intentional omission in cases of sports cheating to confirm the level of ethical sensitivity of individuals.

In spite of international efforts to prevent doping, such as

repetitive education and enactment of anti-doping rules, is still a frequent occurrence [9]. According to the Anti-Doping Rule Violation Report from the World Anti-Doping Agency (WADA), 1595 out of 229,514 doping tests were reported as anti-doping rule violations [10]. The act of doping is not determined by the knowledge of prohibited substances, but it is highly related to the individual athlete's attitude toward doping. Furthermore, the attitude toward doping is complexly related to individual factors (motivation, self-esteem, confidence), situational factors (social relationships), and environmental factors (availability of prohibited substances) [11–16].

Due to the frequent occurrence of anti-doping rule violations, the WADA conducts regular sociological, behavioral, and biological research on the factors influencing doping prevention. One such factor is the athlete's mindset and tendency toward doping. Petróczy and Aidman [17] revealed that, athletes who use banned substances have a more open mindset toward doping than those who do not, and it is generally difficult to establish objective evidence of the usage of these banned substances. Hence, the doping mindset can be considered as an essential aspect of being able to perform the actual act of doping. In addition, doping mindset is attracting attention as a risk factor related to the induction of doping behavior

[18]. Therefore, in recent anti-doping research, there has been a growing trend of sociological and behavioral inquiries into athletes' mindset and beliefs about using prohibited substances in addition to biomedical analysis [11].

However, there has yet to be any research on the relevance of sports ethical sensitivity, even though athletes' mindset and tendency toward doping are important factors for its prevention. Therefore, this study aims to investigate the effect of athletes' ethical sensitivity on their mindset and tendency toward doping, and confirm whether sex and age have a moderating effect.

2. Materials and methods

2.1 Participants

For the purpose of this study, a group of Korean athletes was selected from the 130,357 registered athletes in the Korea Sports Association as of 2022. After a confidence level of 99% and a sampling error of ± 4 is applied, the required number of athletes for our study was determined to be 1040. As such, 1100 people were planned as the initial sample size *via* a simple random sampling method in consideration of refusals to respond and insincere data. A survey was conducted with the 1100 initially planned participants, and a total of 1003 participants was selected as the final research participants, excluding those who refused to respond and provided insincere data. This corresponds to a standard error of $\pm 4.06\%$ at the 99% confidence interval for the population. Looking at the specific characteristics of the study participants, there were 673 males, 330 females, 304 adolescents, and 699 adults. In addition, participants were informed that participation was voluntary after the research director explained the purpose and contents of the study.

2.2 Measurements

The questionnaire used in this study consists of five questions on demographical characteristics, 12 questions on ethical sensitivity to sports misconduct, and 17 questions on mindset and tendency toward doping. For ethical sensitivity to sports misconduct, the tool developed by Choi [8] was used. Ethical sensitivity items are configured such that there is no intermediate response that is neither positive nor negative, using a 6-point Likert scale (1 = strongly disagree and 6 = strongly agree). The maximum score is 72 points, and the higher the score, the more generous the attitude toward cheating in sports situations. It has been reported that all conformity verification results of ethical sensitivity questions targeting Korean adult athletes are satisfied with the standard value [8].

For the mindset and tendency toward doping, the Performance Enhancement Attitude Scale (PEAS) developed by Petróczi [18] and translated into Korean by Kim and Kim [19] was used. The PEAS questions are configured in such a manner that there is no intermediate response that is neither positive nor negative, using a 6-point Likert scale (1 = strongly disagree and 6 = strongly agree). The maximum score is 102 points, and the higher the score, the more generous the athletes' mindset and tendency toward doping [12]. A previous study targeting university athletes,

elite athletes, coaches, and college students in the United States and Hungary, suggested that PEAS has high internal consistency and is an appropriate model for measuring the mindset and tendency toward doping [17].

2.3 Statistical analyses

For data processing, first, to check the validity and reliability of the sports ethical sensitivity and PEAS survey tool, the item fit index (infit, outfit mean squares) and Point-Measure Correlation Coefficient (P-MCC) was calculated by applying the IRT-based many-facets Rasch model. In the item fit index, overfit and inappropriate items were identified through the criteria of more than 1.5 and less than 0.5, and the P-MCC was evaluated as an item with a validity problem if it shows a value of less than 0.3, which is a general standard [20]. If the goodness of fit index or P-MCC value did not satisfy the criteria, it was deleted. Second, independent sample verification was conducted to compare the sports ethical sensitivity and mindset and tendency toward doping according to sex and age. Third, path analysis was conducted to investigate the effect of sports ethical sensitivity on the mindset and tendency toward doping. Fourth, pairwise parameter comparison values were calculated by applying multi-group analysis to the path analysis results to verify the moderating effect of sex and age on the effect of sports ethical sensitivity on mindset and tendency toward doping. *p*-value is less than or equal to 0.05, and Facets (version 3.67.1, Linacre, Chicago, IL, USA) and AMOS (version 18.0, IBM, New York, NY, USA) were used as programs for the analysis.

3. Results

3.1 Verification of the validity and reliability of items for sports ethical sensitivity and PEAS

To check the validity and reliability of the sports ethical sensitivity and PEAS survey tool, the item fit index and P-MCC were calculated. Consequently, the fitness index showed values of 1.5 or more and 0.5 or less in three questions and five questions of the ethical sensitivity and PEAS survey tool, respectively. The P-MCC showed a value of 0.3 or more in all questions. Therefore, the three and five items whose fitness index deviated from the standard value were deleted, leaving a remainder of nine items to analyze ethical sensitivity and 12 items to analyze mindset and tendency toward doping. The reliability and validity details are presented in Tables 1 and 2.

3.2 Comparison of sports ethical sensitivity and PEAS by sex and age

Table 3 shows the results of comparing sports ethics sensitivity and mindset and tendency toward doping according to the sex and age of athletes. Ethical sensitivity by sex was found to be statistically significant at the level of $t = -2.250$ and $p = 0.033$, and females were found to be more ethically sensitive than males. This means that females are more prone to cheating in sports situations than males. There was no statistically significant difference in ethical sensitivity by age ($t = -0.211$, p

TABLE 1. Verification on validity and reliability of items for sports ethical sensitivity.

Area	No.	Contents	Infit	Outfit	P-MCC
Ethical sensitivity	1	Take banned medication to enhance performance	0.82	1.09	0.62
	2	Intentionally underperform for economic benefits	0.69	0.71	0.61
	3*	Use banned equipment to enhance performance	0.68	0.49	0.61
	4	Intentionally take diuretics/Lasix/water pill for rapid weight loss	1.06	1.39	0.66
	5*	Deliberately injure the opposing team's star player	1.37	1.86	0.63
	6	Intentionally underperform to face an easier opponent in the next game	1.06	1.14	0.71
	7	Intentionally underperform to benefit opposing player or school	0.92	1.05	0.71
	8	Bribe the judge/referee for favorable call(s) to win a game	0.75	0.53	0.59
	9	Ask the league organizers to deliberately change the tournament or play order	0.64	0.62	0.6
	10*	Use substitute/reserve player in games after the team qualified for the tournament	1.94	2.16	0.68
	11	Intentionally underperform without any compensation	0.92	0.94	0.7
	12	Not react to bad call(s) by referee during the game	1.03	1.31	0.64

*Question deleted due to inappropriate fitness index. P-MCC: Point-Measure Correlation Coefficient.

TABLE 2. Verification on validity and reliability of items of performance enhancement attitude scale.

Area	No.	Contents	Infit	Outfit	P-MCC
PEAS	1*	Doping is necessary to be competitive	1.56	1.91	0.40
	2	Doping is not cheating since everyone does it	1.02	0.95	0.42
	3	Athletes often lose time due to injuries and drugs can help to make up for lost time	0.91	1.29	0.50
	4	Only the quality of performance should matter, not the way athletes achieve it	1.14	1.45	0.48
	5	Athletes (in my sport) are pressured to take performance-enhancing drugs	0.68	0.72	0.48
	6	Athletes take recreational drugs because they help them in sport situations	0.68	0.62	0.49
	7	Athletes should not feel guilty about breaking the rules and taking performance-enhancing drugs	0.66	0.52	0.47
	8	The risks related to doping are exaggerated	0.88	1.06	0.53
	9*	Athletes have no alternative career choices	1.24	1.75	0.55
	10	Recreational drugs motivate athletes to train and compete at the highest level	0.63	0.61	0.52
	11	Doping is an unavoidable part of competitive sports	0.96	1.02	0.52
	12*	Recreational drugs help to overcome boredom during training	0.56	0.43	0.52
	13	There is no difference between drugs, fiberglass poles, and speedy swimsuits that are all used to enhance performance	0.74	0.85	0.51
	14	Media should talk less about doping	1.00	1.09	0.51
	15*	The media blows the doping issue out of proportion	1.59	1.63	0.60
	16*	Health problems related to rigorous training and injuries are just as bad as doping	1.90	1.96	0.61
	17	Legalizing performance enhancements would be beneficial for sports	0.78	0.74	0.52

*Question deleted due to inappropriate fitness index. P-MCC: Point-Measure Correlation Coefficient; PEAS: Performance Enhancement Attitude Scale.

TABLE 3. Comparative analysis of ethical sensitivity and PEAS by sex and age.

Classification		N	M	SD	<i>t</i>	<i>p</i>	\overline{ES}	
Ethical sensitivity	Sex	Male	673	11.7	5.13	-2.250	0.033	-0.147
		Female	330	12.5	6.02			
	Age	Adolescents	304	11.9	5.42	-0.211	0.833	-0.018
		Adults	699	12.0	5.47			
PEAS	Sex	Male	673	19.6	8.15	-1.215	0.225	-0.085
		Female	330	20.3	8.27			
	Age	Adolescents	304	20.7	7.88	2.203	0.028	0.147
		Adults	699	19.5	8.30			

PEAS: Performance Enhancement Attitude Scale; N: Number of cases; M: Mean; SD: Standard Deviation.

TABLE 4. Effect of sports ethical sensitivity on PEAS.

Path	Unstandardized		Standardized Estimate	C.R (<i>t</i>)	<i>p</i>	R^2
	Estimate	S.E				
Sensitivity → PEAS	1.025	0.035	0.682	29.530	<0.001	0.465

PEAS: Performance Enhancement Attitude Scale; S.E: Standard Error; C.R: Critical Ratio.

= 0.833). There was also no statistically significant difference in the mindset and tendency toward doping based on sex ($t = -1.215$, $p = 0.225$). However, by age, this was found to be statistically significant at the level of $t = 2.203$ and $p = 0.028$, and it was found that adolescents scored higher on the PEAS than adults. This implies that adolescents have a more generous mindset and higher tendency toward doping than adults.

3.3 Effect of sports ethical sensitivity on the mindset and tendency toward doping

To investigate the effect of sports ethical sensitivity on mindset and tendency toward doping, a path analysis was conducted and the results are shown in Table 4. Sports ethical sensitivity was found to have a statistically significant effect on the mindset and tendency toward doping at the level of $t = 29.530$, $p < 0.001$, and the R^2 value indicating the explanatory power of the model was 0.465. It was found that ethical sensitivity explained 46.5% of PEAS.

3.4 Moderating effect of sex and age on the effect of sports ethical sensitivity on PEAS

A multi-group analysis was conducted on the path analysis results to determine whether there was a moderating effect of sex and age variables on the effect of sports ethical sensitivity on the mindset and tendency toward doping. Multigroup analysis is a method of generating a model for each group and verifying the significance of the coefficients at the same location. According to the z-distribution, if it is outside a range based on ± 1.96 , there is a statistically significant difference, and there is a moderating effect of the variable.

The results shown in Table 5. In the case of sex, ethical sensitivity was found to have a statistically significant effect on the mindset and tendency toward doping. The standardized

estimate values were 0.637 for males and 0.692 for females, which indicates that ethical sensitivity and the mindset and tendency toward doping had a static relationship in both males and females. The pairwise parameter comparison value was -0.929, which did not deviate from the standard value of ± 1.96 , indicated that there was no moderating effect. In the case of age, ethical sensitivity was found to have a statistically significant effect on the mindset and tendency toward doping. The standardized estimate values were 0.690 for adolescents and 0.645 for adults, implying that ethical sensitivity and the mindset and tendency toward doping had a static relationship in both adolescents and adults. The pairwise parameter comparison value was 0.183, indicating that there was no moderating effect.

4. Discussion

On examining the differences in ethical sensitivity according to sex and age, it was found that females are more open to cheating in sports than males, and there was no such difference between adolescents and adults. On the contrary, in terms of the mindset and tendency toward doping, there was no difference between males and females whereas adolescents had a higher doping tendency than adults. This finding contradicts the results of previous studies. According to Choi [8], there was no difference in ethical sensitivity by sex. Yet, according to Seo [21], males were more ethically sensitive than females from his survey of university athletes. Moreover, on investigating the level of ethical sensitivity according to age, Browning and Graves [22] reported that the higher the age, the lower the ethical awareness, whereas Beak and Park [23] reported the opposite. Regarding the mindset and tendency toward doping, Muwonge *et al.* [24] reported females scoring higher than males, whereas Alaranta *et al.* [25] and Moran *et al.* [26] reported the opposite. In addition, Kim and Kim

TABLE 5. Moderating effect of sex and age on the effect of sports ethical sensitivity on PEAS.

Classification	Unstandardized		Standardized Estimate	C.R (<i>t</i>)	<i>p</i>	PPC
	Estimate	S.E				
Sex						
Male	1.066	0.050	0.637	21.411	<0.001	-0.929
Female	0.996	0.057	0.692	17.401	<0.001	
Age						
Adolescents	1.031	0.062	0.690	16.625	<0.001	0.183
Adults	1.045	0.047	0.645	22.265	<0.001	

S.E.: Standard Error; *C.R.*: Critical Ratio; *PPC*: Pair Parameter Comparison.

[27] reported that adults had higher PEAS than adolescents, whereas Chu *et al.* [28] reported the opposite. Therefore, an in-depth discussion through meta-analysis is necessary to judge ethical sensitivity and the mindset and tendency toward doping according to sex and age.

Analyzing the relationship between ethical sensitivity and the mindset and tendency toward doping revealed that ethical sensitivity had a statistically significant effect on the mindset and tendency toward doping, indicating a positive relationship. In other words, this means that the more generous athletes are towards cheating in sports and doping, the more likely they are to engage in such behaviors. In addition, this study verified whether the variables of sex and age mediate the relationship between athletes' ethical sensitivity and their mindset and tendency toward doping. Results, conform with the findings of previous studies that doping is related to complex factors, such as personal circumstances and environments. As a result, sex and age were found not to be statistically significant as control variables, indicating that ethical sensitivity at the same level indicates a positive relationship with athletes' mindset and tendency toward doping, regardless of sex and age. Therefore, increasing the ethical sensitivity of athletes will increase their PEAS score, and ultimately help prevent doping.

This study has certain limitations. First, participants in this study were selected without considering the category. It will be challenging to generalize the findings of this study to all sports because mindset and tendency toward doping may be different depending on the characteristics of the sport. Second, in the process of verifying the reliability and validity of the questionnaire used in this study, three items for the ethical sensitivity and five items for PEAS were deleted. Therefore, it is difficult to directly compare the total score reported in previous research. Third, this study is targeting Asian adults, so, future studies should be conducted with a target of various races.

5. Conclusions

The ethical sensitivity showed differences according to sex, while athletes' mindset and tendency toward doping varied according to age. Specifically, females are more inclined toward cheating in sports situations than males and adolescents have a more generous mindset and higher tendency toward doping than adults. Further, ethical sensitivity was found to have a statistically significant effect on the mindset and

tendency toward doping. In addition, when analyzing the effect of ethical sensitivity on the mindset and tendency toward doping, the moderating effect of sex and age was not found to have a statistically significant effect. In conclusion, our findings confirmed that ethical sensitivity has a positive relationship with PEAS. In other words, improving the ethical sensitivity of athletes will increase their ethical awareness and help prevent unethical behavior such as doping. Future studies might consider a detailed analysis by item and target various moderating variables besides sex and age.

AVAILABILITY OF DATA AND MATERIALS

The data presented in this study are available on reasonable request from the corresponding author.

AUTHOR CONTRIBUTIONS

MJ and H-JY—designed the research study and methodology, contributed to data curation, and supervised the study. H-JY—provided the software. J-HP and HO—contributed to resource and data curation, contributed to visualization creation. H-JY and MJ—revised the manuscript. All authors wrote the manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was performed in compliance with the Helsinki Declaration guidelines and approved by the Ethical Review Committee of Korea National Sport University (Research Ethics No.: 20220325-018). Each participant was voluntary, who was informed of the study objective and context and provided their written informed consent regarding privacy and information management policies.

ACKNOWLEDGMENT

Not applicable.

FUNDING

This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of

Korea (NRF-2020S1A5A2A03044544).

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

- [1] Rabouin EM. Walking the talk: transforming law students into ethical transactional lawyers. *DePaul Bus. L.J.* 1996; 9: 1.
- [2] Wittmer DP. Ethical sensitivity in management decisions: developing and testing a perceptual measure among management and professional student groups. *Teaching Business Ethics.* 2000; 4: 181–205.
- [3] Clarkeburn H. A test for ethical sensitivity in science. *Journal of Moral Education.* 2002; 31: 439–453.
- [4] Rest JR. *Moral development: advances in research and theory.* Praeger: New York. 1986.
- [5] Lim M. Effects of moral sensitivity and critical thinking disposition on perceived ethical confidence in nursing students. *Journal of the Korea Academia-Industrial Cooperation Society.* 2016; 17: 610–618.
- [6] Mattison M. Ethical decision making: the person in the process. *Social Work.* 2000; 45: 201–212.
- [7] Rest JR. Morality. In: W. Damon, R. M. Lerner, & N. Eisenberg (eds). *Handbook of Child Psychology* (pp. 556–629). Wiley: New Jersey. 1983.
- [8] Choi C. Ethical sensitivity of adult athletes to sports manipulation. *The Korean Data Analysis Society.* 2018; 20: 949–959.
- [9] Gucciardi DF, Jalleh G, Donovan RJ. An examination of the sport drug control model with elite Australian athletes. *Journal of Science and Medicine in Sport.* 2011; 14: 469–476.
- [10] World Anti-Doping Agency (WADA). *Anti-Doping Rule Violations (ADRVs) Report.* 2016. Available at: https://www.playtruejapan.org/code/provision/pdf/2016_adrvs_report_web_release_april_2018_0.pdf (Accessed: 14 August 2022).
- [11] Morente-Sánchez J, Zabala M. Doping in sport: a review of elite athletes' attitudes, beliefs, and knowledge. *Sports Medicine.* 2013; 43: 395–411.
- [12] Petróczy A. Attitudes and doping: a structural equation analysis of the relationship between athletes' attitudes, sport orientation and doping behaviour. *Substance Abuse Treatment, Prevention, and Policy.* 2007; 2: 34.
- [13] Zucchetti G, Candela F, Villosio C. Psychological and social correlates of doping attitudes among Italian athletes. *International Journal of Drug Policy.* 2015; 26: 162–168.
- [14] Sekulic D, Tahiraj E, Zvan M, Zenic N, Uljevic O, Lesnik B. Doping attitudes and covariates of potential doping behaviour in high-level team-sport athletes; gender specific analysis. *Journal of Sports Science & Medicine.* 2016; 15: 606–615.
- [15] Kisaalita NR, Robinson ME. Attitudes and motivations of competitive cyclists regarding use of banned and legal performance enhancers. *Journal of Sports Science & Medicine.* 2014; 13: 44–50.
- [16] Erickson K, McKenna J, Backhouse SH. A qualitative analysis of the factors that protect athletes against doping in sport. *Psychology of Sport and Exercise.* 2015; 16: 149–155.
- [17] Petróczy A, Aidman E. Measuring explicit attitude toward doping: review of the psychometric properties of the performance enhancement attitude scale. *Psychology of Sport and Exercise.* 2009; 10: 390–396.
- [18] Petróczy A. Measuring attitude toward doping: further evidence for the psychometric properties of the performance enhancement attitude scale. In *14th Congress of the European Association for Sport Management*, Nicosia, Cyprus. 2006.
- [19] Kim EK, Kim TG. Attitudes and dispositions toward doping in Korean national players. *Korean Journal of Sports Science.* 2014; 23: 215–224.
- [20] Linacre JM. Optimizing rating scale category effectiveness. *Journal of Applied Measurement.* 2002; 3: 85–106.
- [21] Seo H. A study on the factors influencing unethical pro-organizational behavior of intercollegiate athletes. *The Korean Journal of Physical Education.* 2018; 57: 221–233.
- [22] Browning DH, Graves SA. Incidence of aspiration with endotracheal tubes in children. *The Journal of Pediatrics.* 1983; 102: 582–584.
- [23] Beak SY, Park BD. The study on the ethical sensitivity and the consciousness of the vocational ethics for the prospective adapted sport instructors. *Korea Journal of Adapted Physical Activity.* 2016; 24: 23–33.
- [24] Muwonge H, Zavuga R, Kabenge PA. Doping knowledge, attitudes, and practices of Ugandan athletes': a cross-sectional study. *Substance Abuse Treatment, Prevention, and Policy.* 2015; 10: 37.
- [25] Alaranta A, Alaranta H, Holmila J, Palmu P, Pietilä K, Helenius I. Self-reported attitudes of elite athletes towards doping: differences between type of sport. *International Journal of Sports Medicine.* 2006; 27: 842–846.
- [26] Moran A, Guerin S, Kirby K, MacIntyre T. The development and validation of a doping attitudes and behaviour scale. *World Anti-Doping Agency and The Irish Sports Council.* 2008.
- [27] Kim T, Kim YH. Korean national athletes' knowledge, practices, and attitudes of doping: a cross-sectional study. *Substance Abuse Treatment, Prevention, and Policy.* 2017; 12: 7.
- [28] Chu Z, Kim YJ, Kim T. The influence of demographic information, knowledge of doping and education of anti-doping on attitude toward doping among elite handball players. *Journal of Digital Convergence.* 2018; 16: 553–560.

How to cite this article: Hyo-Jun Yun, Jae-Hyeon Park, Hyeri Oh, Minsoo Jeon. Effect of athletes' ethical sensitivity on doping mindset and tendency: moderated by sex and age. *Journal of Men's Health.* 2023; 19(5): 46-51. doi: 10.22514/jomh.2023.040.