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MEDICAL ETHICS ASSESSMENT SCALE FOR SPORTS: A NEW TOOL

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ABSTRACT

The purpose of this study was to develop the Medical Ethics Assessment Scale for Sports (MEASS) and to asses the vison of amateur level competitor athletes, using this scale, about level of compliance with professional ethical principles of their health professionals and the sports medicine organisations with which they come in contact. The study was conducted on 400 participants (n_{female} =145; n_{male} =255) aged 16-35 from different sports. MEASS was constructed with 13 items and three factors: 'Not harming the patient's body', 'Informing the patient', and 'Maintaining patient's privacy and right to choose care'. The validity value was found to be 0.795. The exploratory factor analysis showed all three factors had eigenvalues greater than 1.0 (55.7% variance). Cronbach's Alpha reliability (α) correlation coefficient was 0.725. These results showed that the scale is suitable for factor analysis and reliable. The MEASS can be used as a new measurement tool to evaluate the ethics of health professionals and organisations. The results also demonstrated that athletes feel well-informed and unharmed by their physicians, but would prefer more control over their care choices and how their personal information is used.

***Keywords**:* Ethics; Health; Medical ethics; Sports; Medicine.

INTRODUCTION

Sports physicians are legally and ethically obligated to protect human rights, individuals and groups. Various international organisations (ACSM, 2008; ACSP, 2008; FIMS, 2016a; FIMS, 2016b), have published guidelines for the roles of sports physicians and the ethical rules they must comply with in their own codes.

There are no universally accepted ethical rules in sports medicine (Testoni *et al.*, 2013*).* Moreover, it has been reported that the traditional principles related to patients and physicians, especially confidentiality and patient autonomy (Dunn *et al*., 2007), are not always followed in sports medicine, which can cause unique ethical problems (Atici *et al*., 2004; Dunn *et al*., 2007). These problems have thus far not been researched thoroughly (Anderson & Gerrard, 2005; Peer, 2017).

To our knowledge, there is no existing multidisciplinary approach to collecting opinions of athletes about the ethical problems regarding their physicians, managers and coaches, all of whom play important roles in the protection of the health of athletes, as well as in performance enhancement. The absence of a questionnaire-scale to reveal relevant problems is evident.

PURPOSE OF RESEARCH

The main purpose was to create a new scale for the medical ethics assessment properties of each item within the questionnaire and to assess the construct validity and test-retest reliability of Turkish version of the called MEASS for the amateur level competitor athletes.

Based on the above, the second purpose of the study was to assess an amateur level competitor athlete's vison by using MEASS, about their health professionals' level of compliance with professional ethical principles and the sports medicine organisations with which they come in contact. To our knowledge, this is the first scale developed for this purpose. This scale was created to reveal the ethical problems of health professionals and organisations, as well as harmful healthcare applications and breaches of confidentiality from the point of view of athletes.

METHODOLOGY

Ethical clearance

This study was conducted with the approval of the Ethical Committee of Marmara University (clearance number 27022011/12). It involved volunteer licensed athletes who signed a written statement of informed consent. All participants were informed about the purpose of the study through an accompanying letter.

Participants

The research population was composed of licensed amateur level competitor athletes from different sports in Istanbul. There was a total of 400 participants (n_{female} =145; n_{male} =255) aged 16-35 (mean age=22.14±3.3) (Table 1) and selected from randomised individual sports (artistic gymnastics, track and field, badminton, golf, wrestling, weightlifting, judo, karate, table tennis, rhythmic gymnastics, scuba diving, taekwon-do, tennis, swimming, and skiing) and team sports (basketball, handball, soccer, rowing, synchronised swimming, water polo, and volleyball).

Structure of measurement scale

The *Medical Ethics Assessment Scale for Sports* (MEASS) was created with 26 items that are considered by the authors to represent adherence to sports ethics principles. In preparing the questionnaire, the 'Declaration on Principles of Health Care in Sports Medicine' (adopted at the 34th World General Assembly in September/October 1981 in Lisbon, Portugal) and the Health Care Principles and Ethics in Sports Medicine (prepared according to the recommendations of the World Health Organisation) were utilised.

The face validity assessment was done to check the understandability and suitability of the questions. Therefore, the questionnaire firstly was given to the health staffs (physical therapist and medical doctors), national coaches, elite athletes who did not participate to the present study, and finally three faculty members, specialising in ethics, sports and health were consulted.

The questionnaire consists of 26 questions in the following sections: 1) demographic characteristics and what type of health care support was received (5 questions); 2) injury experiences and the events during and after rehabilitation (3 questions); and 3) opinions about trust, confidentiality, information and election principles within the scope of the patient-physician relationship and the patient-health-institution relationship (18 questions). For the

questions in the third section, the following five-point Likert-type scale and arithmetic average intervals were used: 5=I absolutely agree‘ (4.21-5.00); 4=I agree (3.41-4.20); 3=I partially agree/partially disagree (2.61-3.40), 2=I do not agree (1.81-2.60) and 1=I definitely do not agree (1.81-2.60).

The range width of the scale is calculated with the formula ‘sequence width/number of groups to be made. Materials with negative sentence roots (namely, items 8, 9, and 18) were reversed during the scoring phase. Scales with an alpha value of at least 0.70 are assumed to be reliable (De Vaus, 2002).

Pilot study

The questionnaire applied to 60 athletes from the sample group of study. For estimating the test–retest reliability, the participants completed the questionnaire twice within two weeks. A five-point Likert-type scale was used for the response to the questions. The questionnaire consisted of a total of 26 items. The final shape of the scale was developed and the opinions of experts on ethics, sports and health sciences were again taken into account. The reliability of the test was analysed by test-retest, and it was found that the coefficient was statistically significant at over 0.75 for each item ($p<0.001$). The Pearson Moments Multiplication Correlation analysis showed that each item in the measure was consistent (De Vaus, 2002).

Procedures

The questionnaire containing the MEASS was both delivered and collected by hand. It was delivered to 480 people and collected from 400 people (response rate 87.5%).

Analysis of data

Validity and reliability analyses were carried out. The validity of the draft scale was examined and factor analysis evaluating the validity of the structure. Afterwards, individual reliability analyses of scale items, sub-factors and scale items for each sub-factor were tested. A factor analysis (Principal Components Analysis) for construct validity of the scale was also performed. The Kaiser-Meyer-Olkin (KMO) coefficient and the Barlett Sphericity test were used for the fit of the sample and the data of the analysis of the principal components. For the determination of the number of factors, Varimax rotation was used and the lower limit of an eigenvalue of 1.00 was accepted. The reliability of the scale was calculated using the Cronbach Alpha method (Tabachnick & Fidell, 2007).

RESULTS

The demographic information of the participants is shown in Table 1. The majority of the participants were male (63.7%), single (94.5%) and university students (81.3%). The majority of participants, 57.8%, had 2-10 years of sport experience, and most of them encountered injuries (62.8%). Only 28.5% of them were national team members.

Table 1. **DEMOGRAPHIC FEATURES AND DISABILITY HISTORIES OF ATHLETES**

Variables		**Frequency (n)**	**Percentage (%)**
Gender	Female	145	36.3
	Male	255	63.7
Age in years (16-35 years) (Mean±SD= 22.14±3.33 years)	16-20	133	33.3
	21-25	213	53.3
	25 & up	54	13.5
Marital status	Married	18	4.5
	Single	378	94.5
	Divorced	4	1.0
Years of experience (2-23 years) (Mean±SD=9.86±4.03 years)	2-10	231	57.8
	11+	169	42.2
Educational status	Primary school	1	0.3
	Middle school	3	0.8
	High school	50	12.5
	University	325	81.3
	Master's	21	5.3
Are you a member of the national team?	Yes	114	28.5
	No	286	71.5
Do you receive any income from the team you play for?	Yes	199	49.8
	No	201	50.2
Have you had any injuries?	Yes	251	62.8
	No	149	37.7
	Total	400	100.00

Validity of the scale

Structure validity (factor analysis)

The validity of the scale used in the present study (MEASS), which was developed to determine the opinions of athletes on the ethical principles of health professionals and health institutions, was assessed using factor analysis (Tabachnick & Fidell, 2007) (that is, principal component analysis). The Principal Components Analysis and maximum variability (Varimax) methods were used as vertical rotation methods. Based on the obtained screen plot graph analysis, all data with an eigenvalue higher than one (Eigenvalue >1) were taken into consideration.

It should be noted that the items of the MEASS have a high load value in a single factor and that the difference in the load values in two or more factors is at least 0.1. In Varimax rotation, 0.30 is generally processed as the lower cut-off point of factor loads. Factor loading should be 0.45 or greater for 1.50 observations and above, and values exceeding 0.50 are considered better (Hair *et al.*, 2007). In this study, factor loads of 0.50 and below were not considered, in order to demonstrate stronger relationships in the matrix of transformed components.

The value of the KMO test was 0.795. It can be concluded that sample size is 'good' for factor analysis (Field, 2005). The chi-square value of the Barlett sphericity test is also statistically significant ($X^2_{(153)}$ =1860.328; p<0.01). These results indicate that the correlation matrix of the items in the scale is suitable for factor analysis (Field, 2005).

The factor structure of the scale was determined through Principal Component Analysis (Tabachnick & Fidell, 2007). It has been concluded that our measurement tool can be built on up to five factors. According to the total declared variance and covariance tables, five factors with an eigenvalue greater than 1 were found for 18 items, and their contribution to total variance was shown to be 56.84%, which is considered sufficient (Scherer *et al*., 1988). However, when these five factors were evaluated based on their contribution to the total variance, it was seen that the contributions of the 4th and 5th factors were small and approximately the same. For this reason, the analysis was repeated with three factors.

When the items were evaluated for composite and factor loadings, it was found that the five items gave load values below 0.50 acceptance. When the analysis was reduced to three factors, and factor analysis was performed on the 13 relevant items, and the following values were obtained The first factor had an eigenvalue of 2.844 with a variance of 21.88%; the second factor had an eigenvalue of 2.382 with a variance of 18.33%; and the third factor had an eigenvalue of 2.017 with a variance of 15.51%. The total variance for all three was acceptable (Scherer *et al*., 1988), as were the factor loadings (Field, 2005).

Factor loading values at the subscale level were found to vary between 0.67-0.75 for the five items in the first factor, 0.89-0.82 for the three items in the second factor and 0.57-0.74 for the five items in the third factor. When factor loading values in the reduced form were considered, 13-item scale were examined in terms of magnitude, they were all classified from 'good' to 'excellent'. Eight were excellent, two were very good, and three were good (Tabachnick & Fidell, 2007).

Naming the scale factors

As a result of the analysis of the basic components, the sub-dimensions of the ethical perceptions regarding the 13 items in the draft MEASS were determined to be the following: 'Not harming the patient's body '(5 items), 'Informing the patient '(3 items), and 'Maintaining patient's privacy and right to choose care'(5 items).

Reliability of the scale

Internal consistency analysis

The Cronbach's Alpha (α) correlation coefficient of the 13-item MEASS was 0.725. When factor scores were examined, the reliability coefficients were the following: 0.791 in 'Not harming the patient's body'; 0.866 in 'Informing the patient '; and 0.614 in 'Maintaining patient's privacy and right to choose care'. These coefficients indicate that the scaling instrument is reliable, and that the second factor is highly reliable (Armitage *et al*., 2008). Thus, the scale items have a high internal consistency and can be considered reliable.

Descriptive statistics of factors on scale

Differences between groups according to gender (Table 2) were examined by means of the t-test. In this context, there was no significant difference regarding ethical principles according to gender and injury experienced variables (p>0.05).

Table 2. **ANALYSES OF GENDER, INJURIES AND EXPERIENCE STATUS DIFFERENCES OF MEASURING FACTORS**

Variables		**Frequency (n)**	**Percentage (%)**
Gender	Female	145	36.3
	Male	255	63.7
Age in years (16-35 yrs)	16-20	133	33.3
(Mean±SD= 22.14±3.33 yrs*)*	21-25	213	53.3
	25 & up	54	13.5
Marital status	Married	18	4.5
	Single	378	94.5
	Divorced	4	1.0
Years of experience (2-23 yrs)	2-10	231	57.8
(Mean±SD=9.86±4.03 yrs)	11+	169	42.2
Educational status	Primary school	1	0.3
	Middle school	3	0.8
	High school	50	12.5
	University	325	81.3
	Master's	21	5.3
Are you a member of the national team?	Yes	114	28.5
	No	286	71.5
Do you receive any income from the team you play for?	Yes	199	49.8
	No	201	50.2
Have you had any injuries?	Yes	251	62.8
	No	149	37.7
	Total	400	100.00

* p > 0.05; Years of experience: 2-10 years=intermediate; 11 or more yrs.=advanced

Table 3. **ANALYSIS OF ANSWERS FOR FACTOR 1**

Item	**FACTOR 1** *Do no harm to the body?* ***Statement*** Sport Medicine/Sport Doctor/Specialist	**Strongly disagree**		**Disagree**		**Neither agree nor disagree**		**Agree**		**Strongly agree**		**Mean±SD**
		n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
1	Avoids all applications that will cause damage to the athlete.	4	1.0	10	2.5	60	15.0	182	45.5	144	36.0	4.07±0.84
2	Selects only equipment proven safe for athletes' treatments.	1	0.3	8	2.0	40	10.0	223	55.8	128	32.0	4.17±0.73
3	Does not allow the athlete to participate in training sessions or competitions unless their injury is completely healed.	6	1.5	28	7.0	107	26.8	135	33.8	124	31.0	3.84±0.99
4	Educates the athletes and acts as a role model regarding harmful drug usage.	4	1.0	22	5.5	77	19.3	185	46.3	112	28.0	3.94±0.89
5	Works in correlation with other specialists in order to help the recovery of the injured athletes.	7	1.8	26	6.5	106	26.5	150	37.5	111	27.8	3.81±0.98

1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree

Table 4. **ANALYSIS OF ANSWERS FOR FACTOR 2**

Item	**FACTOR 2-** *Information disclosure to athlete* ***Statements*** Health institutions	**Strongly disagree**		**Disagree**		**Neither agree nor disagree**		**Agree**		**Strongly agree**		**Mean±SD**
		n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
1	The health institution informs me about the benefits of the treatment method they will use before starting the treatment.	3	0.8	36	9.0	81	20.3	196	49.0	84	21.0	3.81±0.89
2	The health institution informs me regarding my treatment plan before starting the treatment.	2	0.5	41	10.3	71	17.8	203	50.8	83	20.8	3.81±0.89
3	The health institution informs me about the side effects of the treatment method they will use before starting the treatment.	9	2.3	47	11.8	89	22.3	180	45.0	75	18.8	3.66±0.99

1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree

Table 5. **ANALYSES OF ANSWERS FOR FACTOR 3**

Item	**FACTOR 3** Right of privacy and choice ***Statements*** Health institutions, all team managers, educators	**Strongly disagree**		**Disagree**		**Neither agree nor disagree**		**Agree**		**Strongly agree**		**Mean±SD**
		n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
1	I would feel uncomfortable if the information related to my treatment and its results were shared with the club (director, manager, trainer, con., etc.).	52	13.0	165	41.3	78	19.5	54	13.5	51	12.8	2.72±1.23
2	I would like to be the decision-maker regarding how much of the information related to my treatment plan and results will be shared with the club (director, manager, trainer, con., etc.).	16	4.0	62	15.5	107	26.8	132	33.0	83	20.8	3.51±1.10
3	The health institution does not share the results of my health check–ups with me.	55	13.8	175	43.8	83	20.8	56	14.0	31	7.8	3.42±1.13
4	The fact that I have to choose from the institutions covered by the club limits my right to choose.	19	4.8	103	25.8	129	32.3	112	28.0	37	9.3	3.11±1.04
5	In my opinion, the treatment chosen by the health institution prepares the athlete in a very short time to be able to compete, but these treatments would cause harm in the long term and will not resolve the injury or related problems.	41	10.3	89	22.3	119	29.8	120	30.0	31	7.8	3.03±1.12

1=Strongly disagree 2=Disagree 3=Neither agree nor disagree 4=Agree 5=Strongly agree

The mean score values according to frequency distributions, percentage values, and the Likert scale for the participants' answers are shown in Tables 3-5.The highest score that can be taken from each factor of the scale is 5.00 and the lowest score is 1.00. If the score is close to 5, the athlete's understanding of ethical principles can be considered high.

DISCUSSION

In this study, a new scale – the Medical Ethics Assessment Scale for Sports (MEASS) – was developed, with sufficient validity and reliability to demonstrate the level of compliance with medical principles of health professionals and organisations. This can help provide services in the field of sports medicine in line with the opinions of athletes.

The MEASS can be used to assess the level of compliance of health professionals and organisations with three basic medical principles in their provided services: 'Not harming the patient's body', 'Informing the patient', and 'Maintaining patient's privacy and right to choose care'.

Patients indicated that they wanted to participate in the process of being informed about treatment alternatives and take part in the decision-making process (Anderson & Gerrard, 2005). However, athletes are in a different position from most patients in terms of health information confidentiality and body immunity, due to their profession (Dunn *et al*., 2007). This may be a potential ethical conflict, as management and especially coaches may ask for confidential information about an athlete's health (Anderson & Gerrard, 2005).

Health care providers should be careful to avoid harmful behaviour toward patients and to take all necessary precautions to ensure that patients are not harmed (Guadagnoli, 1998). In this sense, one of the purposes of the study was to asses an amateur level competitor athlete's vison by using MEASS, about their health professionals' level of compliance with professional ethical principles and the sports medicine organisations with which they come in contact. The results of the present study indicated that athletes' opinions about the principles and values of their medical practitioners do not differ according to injury history, gender or sports experience. Athletes believe that the following factors describe ethical behaviour for health professionals and organisations: 'Not harming the patient's body' (Factor 1), 'Informing the patient' (Factor 2), and 'Maintaining a patient's privacy and right to choose care' (Factor 3).

In the present study general attitudes and attitudes about physician behaviours regarding harm and damage to athletes' bodies were examined in the first factor, from the viewpoint of the athletes. It is remarkable that our research generally shows in all these items in Factor 1, athletes indicated that health professionals do not harm their health. The highest level of participation of views on this factor was in an item (Factor 1, Item 2, Table 3) about the careful behaviour of the physicians and the quality of the materials they use.

The lowest participation rate of our research group was in opinions about the cooperation of health professionals who will be treating the athletes with health professionals from other practices. However, it is important that this collaborative approach should be considered by the patient to be the least harmful and most beneficial approach, and that they ensure the correct recognition and precautions are taken. A health professional who allows an athlete to return to training or competition before the health condition is resolved, is not acting in accordance with the principle of not harming the patient.

The prohibition of substances is based on concerns about avoiding unfair advantage and the safety of the athletes (Testoni *et al*. 2013). According to the results of the present study, athletes

believe physicians and health professionals help them stay away from the use of harmful substances and inform them about all pertinent information. These results show that the centres where the athletes are treated do respect the autonomy of the patient in terms of medical ethics and law. However, it is also important and should be noted that the hesitance about this subject, and the levels of negative opinions regarding it, were high.

These results are also support the findings of Dunn et al. *(*2007), reporting that the team doctor has an ethical and legal obligation to protect the player from possible damage to items that increase performance in the short and long term. However, it is noteworthy that the hesitance and non-participation rate on the relevant items of our scale is also higher. Therefore, further training of physicians to inform the athlete of the psychological and physical harm of performance enhancements substances and prevent their use may be beneficial to athletes.

Patients want to be informed about treatment alternatives and to take part in the decision-making process of care (Johnson, 2004). In the present study, athletes had positive opinions about being informed about benefits and harms of the medical treatment methods applied by health professionals.

The athletes desire confidentiality (Greenfield & West, 2012), which is among the potential ethical conflicts faced by sports physicians (Anderson & Gerrard, 2005). More than half of our participants indicated that they are not uncomfortable about sharing their information without their consent with director, manager, trainer, social media sites, web -based portals, visual and written media, etc. This result is not similar to other research results indicating that it is a common problem for athletes to hide their health information from health organisations and from the media (Greenfield & West, 2012).

On the other hand, the athletes want to have the privacy of their health information related to their treatment plan and their right to make their own healthcare choices. The results also suggested that 1 out of every 3 participants believe that taking health care only from club-contracted health centres is a limitation on health choice. Furthermore, the answers given to the item about the selection of treatment methods that enable athletes to return to the game as quickly as possible causes long-term damage is a great concern. The similar numbers of positive and negative opinions on the relevant items can be seen as a sign of the lack of trust, on the part of athletes, in health professionals.

The study of Greenfield and West (2012) suggests that one of the ethical problems in sports medicine is that athletes do not trust the team doctor, which also supports the results of this study. However, it should not be forgotten that sports physicians may also be influenced by coaches, managers and media pressure at this stage. The higher competition level and the higher financial implications, the more ethical boundaries will be pushed especially at the professional level.

There will be greater pressure on the medical practitioners to keep the player participating and there will be more information sharing at the professional team/sports level. Therefore, confidentiality will be compromised at a higher level. Ideally, the decision should be based on the risks and consequences for the athlete's health, not on the effect on the result of the competition or on the advice of the coaches (Resnik, 2015). Hence, the entire team members need to be more careful to avoid the sports physicians in potential ethical conflicts. Our participants consist of amateur athletes who are not at a professional level. Therefore, it can be recommended for the future studies, to design a new study for professional level athletes.

PRACTICAL APPLICATION

The fact that the opinions of all these athlete about professional ethical principles and values, do not differ due to injury history, gender, or sports experience and is very important sports health and ethical concepts. Health specialists must be aware that they need to take more precautions to prevent athletes from participating in competitions and training before having recovered fully, as well as to improve mental and physical health by informing players about the harmful effects of performance enhancing drugs. Increasing the level of compliance of health professionals and organisations with professional ethical principles can be achieved by making all these things an integral part of athletic health services.

CONCLUSIONS

The present study had some limitations. One of them was that the sample was composed of participants of different sports settings and different performance levels. Future research could explore the particular issues facing athletes of different sports and performance levels. Furthermore, there are some ethical concerns that are not included in the questionnaire of this study. One of the major privacy concerns are that most treatments occur in team rooms/locker rooms where the athlete is exposed to other athletes and coaching staff.

Another ethical concern can be time pressure on the doctor when assessing a possibly injured player on-field. This kind of situation can affect the athlete's opinion regarding the confidence in the doctor to have the necessary skills to do fast assessment. These situations can be considered as a limitation of the study and it could be investigated in future researches. The MEASS was created in Turkish, and may need to be translated into English for future studies. Moreover, the results only partially supported the scale's reliability and validity. Finally, longitudinal studies are needed to investigate the predictive validity and test-retest reliability of the MEASS.

Future research should further delineate or confirm the ethical issues found by this study. In addition, the examination of the factors revealed on the scale in terms of different variables may be the subject of future research, especially at elite and professional levels.

A future prospect of these authors is planning to revise and extend this survey by submitting the questionnaire in the national and international level of amateur and professional athletes in order to establish whether there is a difference between the professional and non-professional athletes. Futures studies could endeavour to develop a new measurement tool that would assess the opinions of healthcare professionals.

REFERENCES

ACSM (American College of Sports Medicine) (2008). "Code of ethics". Hyperlink: [http://www.kines.umich.edu/sites/default/files/eth_acsm_code_of_ethics.pdf]. Retrieved on 12 February 2018.

ACSP (Australasian College of Sports Physicians) (2008). "Code of ethics & professional behaviour". Hyperlink: [https://acsp.org.au/uploads/ACSP% 20Code%20of%20Ethics% 20 April%20 2008.pdf]. Retrieved on 25 February 2018.

ANDERSON, L.C. & GERRARD, D.F. (2005). Ethical issues concerning New Zealand sports doctors. *Journal of Medical Ethics*, 31(2): 88-92.

ARMITAGE, P.; BERRY, G. & MATTHEWS, J.N.S. (2008). *Statistical methods in medical research* (4th ed.). New York, NY: Wiley.

ATICI, T.; ATICI, E. & SAHIN, N. (2004). Spor hekimliği ve etik [*trans.*: Sports medicine and ethics]. *Turkiye Klinikleri* [trans.: *Journal of Medical Ethics*], 12(3): 183-188.

DE VAUS, D. (2002). *Analysing social science data: 50 Key problems in data analysis.* London, UK: Sage.

DUNN, W.R.; GEORGE, M.S.; CHURCHILL, L. & SPINDLER, K.P. (2007). Ethics in sports medicine. *American Journal of Sports Medicine*, 35(5): 840-844.

FIMS (Federation International de Medicine Sportive) (2016a). "Principal and ethical guidelines for health care for sports medicine". Hyperlink: [http://www.fims.org/en/general/code-of-ethics/2016]. Retrieved on 24 January 2018.

FIMS (International Federation of Sports Medicine) (2016b). "Code of ethics". Hyperlink: [https://www.fims.org/about/code-ethics/]. Retrieved on 12 February 2018.

FIELD, A. (2005). *Discovering statistics using SPSS.* London, UK: Sage.

GREENFIELD, B.H. & WEST, C.R. (2012). Ethical issues in sports medicine: A review and justification for ethical decision making and reasoning. *Sports Health*, 4(6): 475-479.

GUADAGNOLI, E. & WARD, P. (1998). Patient participation in decision making. *Social Science and Medicine*, 47(3): 329-339.

HAIR, J.F.J.; BLACK, W.C.; BABIN, B.J. & ANDERSON, R.E. (2007). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Pearson Education.

JOHNSON, R. (2004). The unique ethics of sports medicine. *Clinics in Sports Medicine*, 23(2): 175-182.

PEER, K.S. (2017). Ethics in sports medicine: Perspectives on fulfilling the social contract between health care providers and society. *International Journal of Athletic Therapy and Training*, 22(1): 1-4.

RESNIK, D.B. (2015). "What is ethics in research and why is it important in ideas". Hyperlink: [https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm?links=false]. Retrieved on 15 January 2018.

SCHERER, R.F.; LUTHER, D.C.; WIEBE, F.A. & ADAMS, J.S. (1988). Dimensionality of coping: Factor stability using the ways of coping questionnaire. *Psychological Reports*, 62(3): 763-770.

TABACHNICK, B.G. & FIDELL, L.S. (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson Education/Allyn and Bacon.

TESTONI, D.; HORNIK, C.P.; SMITH, P.B.; BENJAMIN Jr., D.K. & MCKINNEY Jr., R.E. (2013). Sports medicine and ethics. *American Journal of Bioethics*, 13(10): 4-12.

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