RESEARCH ARTICLE

Motivation and factors affecting sports participation: a cross-sectional study on female medical students in Pakistan

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Abstract

Objective: To determine the factors associated with participation of Pakistani female students in organised sports at a university in a rural setting in Pakistan.

Methods: This cross-sectional study was conducted during March and April 2017 at the Peoples University of Medical & Health Sciences for Women, Nawabshah in the Sindh province of Pakistan, and comprised undergraduate female students who got injured during the "Sports Week" organized at the university and visited the on-site physiotherapy camp. Data collection tools included physical activity and leisure motivation scale, sport motivation scale, and athlete fear avoidance questionnaire. SPSS v20 was used for data analysis.

Results: Of the 403 students participating in the Sports Week, sports injuries were reported by 127(31.51%) students. Regular physical activity was reported by only 28(22%) participants. Overuse was the most common cause of sports injuries 67(52.8%). Ankle was the main affected site 31(24.4%). The most common injury types were cramps 59(46.5%) and sprains 58(45.7%). Use of improper technique was observed in 61(48%) students. The most common intrinsic motives were 'enjoyment', with a mean value of 21.3±2.71, and 'to know' 21.71±5.2. The most common extrinsic motives were 'physical condition', with a mean value of 21.51±2.81, and 'identified regulation' 21.74±5.6.

Conclusion: Prevalence of sports injuries in female university students was high. The students should be trained about the proper way of sports participation.

Keywords: Motivation, Physical activity, Sports, Students, Pakistan. (JPMA 68: 1327; 2018)

Introduction

Physical activity (PA) is essential for one's health as it offers motivation for improving health.[1] The benefits associated with PA are enormous, and insufficient PA levels may increase vulnerability to several negative health outcomes, with particular public health concerns, especially in females.[2] Despite this, global PA prevalence stands at only 31%.[3] Moreover, it has been suggested that physical inactivity increases with increasing age, particularly having higher rates in women and in developed countries.[3] Specifically, university students are in a transitional period accompanied by higher stress levels and susceptibility to lifestyle changes.[4] According to previous reports, a significant decline in PA begins at 12 years of age and many students fail to become active in future.[5] In Pakistan, the rate of physical inactivity was 16% in male and 34% in female undergraduates.[6] Tirdodimos et al suggested that university students are in the last stage of developing health behaviours, so this population is of great importance.[7] In female university students particularly, lower rates of PA have been reported.[7] Hasse et al reported in their study on university students of 23 countries that only 19% females were involved in PA during leisure time, with prevalence of PA in developing countries being only 44%.[8]

Sports is an important means of PA, particularly for young women. Those women who begin sports at an early stage of life are likely to continue it later.[2] Although there are several physical, mental and behavioural benefits of participating in sports, Muslim women tend to have lower participation in sports.[2,9,10] Jefferis et al reported that a large proportion of population in the United Kingdom does not reach the recommended PA levels and sports participation.[11] Similarly, according to Jafar et al, a quarter of Pakistani population is considered overweight and obese.[12] So, it is important that emphasis should be placed on PA and sports participation, especially in females, as it leads to increased body image, self-esteem, and favourable anthropometric characteristics.[2,13]

Although health benefits of sports are supported by a large body of evidence, research suggests that participation in sports, especially in the competitive context, is associated with risk of injury, more commonly musculoskeletal in nature.[14-16] Moreover, previous studies have found a higher incidence of

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injuries associated with PA and recreational sports.[14,17] According to a study in university students from Turkey, 60% of all injuries occurred during work-related sports activities.[18] Therefore, health coverage of athletic events will be helpful in early diagnosis and management of sports injuries, which will subsequently help decrease the chances of injury worsening and promote recovery.[19]

It may be noticed that motivation is an important elucidating factor for active lifestyle and sports participation.[20] It serves as an impetus for exercising because involvement in sports during studies and later depends on motivational structure of the individual and the availability of conditions and opportunities in a certain environment.[21,22] In general, the main motivational factors for students to engage in sports activities include fun, health pressures, enjoyment, physical fitness, improving skills and learning, stress management, being with friends, well-being and competition.[22,23] However, evidence suggests existence of gender differences and that female students are driven by external motives, such as body appearance and weight management.[24,25] Since motivation is an indicator of exercise behaviour, it is imperative to detect students' motives for engagement in PA and sports.[26] Given the higher emphasis of university students' involvement in exercise, this topic is important in context of higher education institutions.[26]

Evidence also suggests that women face several societal challenges and gender discrimination in the realm of sports.[2] In particular, Muslim women encounter several hurdles in participating in sports due to cultural and religious reasons.[9,27] According to previous reports, female Muslim students were interested in participating in sports, but cultural and structural factors limited their PA participation.[6,9] In general, there are fewer opportunities and facilities for females in rural context to engage in PA and sports.[28,29] These findings necessitate the evaluation of such factors in female university students.

The current study was, therefore, planned to determine the prevalence of sports injuries, PA and sports motivation and injury-related fear of students, and other factors associated with the participation of Pakistani female students in organised sports at a university in a rural setting.

Subjects and Methods

This cross-sectional study was conducted during March and April 2017 at the Peoples University of Medical & Health Sciences for Women (PUMHSW), Nawabshah in the Sindh province of Pakistan, and comprised undergraduate female students who got injured during the "Sports Week" organized at the university and visited the on-site physiotherapy camp. This university organises the Sports Week every year but on-site physiotherapy services were available for the first time at the time of the current study. Undergraduate students from Bachelor of Medicine and Bachelor of Surgery (MBBS), Doctor of Physical Therapy (DPT), Doctor of Pharmacy (PharmD) and Bachelor of Science in Nursing (BSN) participated in the sports. Students visiting the physiotherapy camp for any injury were invited to participate in the study, and all of them (n=127) participated voluntarily. Post-graduate students and faculty members visiting the camp for treatment during the Sports Week were excluded. On-site physiotherapy services were provided by a team of male and female physiotherapists and a group of final year physiotherapy students who helped in the management of injuries and data collection from the participants.

Approval for the study was obtained from the institutional ethics committee (Letter No/PUMHS/SBA/274) and informed written consent was taken from all the subjects. The subjects completed a questionnaire concerning demographic and baseline information, physical activity and leisure motivation scale (PALMS), sport motivation scale (SMS-28), and athlete fear avoidance questionnaire (AFAQ). The subjects were asked to fill the questionnaires once they were stabilised in the camp, and it took approximately 60 minutes to fill the questionnaire.

The 40-item PALMS, used to measure participants' physical activity motivation,[30] is a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), and consists of eight subscales: mastery, enjoyment, psychological condition, physical condition, appearance, others' expectations, affiliation, and competition/ego. Each subscale consists of 5 items, with subscale scores ranging from 5 to 25. Moreover, this scale was based on Self-Determination Theory (SDT),[31] with mastery and enjoyment subscales reflecting aspects of intrinsic motivation, and the other six subscales showing the aspects of extrinsic motivation. The six subscales for extrinsic motives are further categorised into body-mind motives, with physical condition, psychological condition, and appearance subscales and social motives, with others' expectations, affiliation, and competition-ego subscales. This scale has

demonstrated robust psychometric properties in previous studies.[31] In the current study, the 40-item PALMS scale demonstrated an excellent reliability with Cronbach's Alpha of 0.931.

The SMS, originally called Échelle de Motivation dans les Sports (EMS), is a multidimensional and contextual measure of intrinsic motivation, extrinsic motivation, and amotivation toward sport. The original scale was created in French and was later translated into English, demonstrating similar psychometric properties.[32,33] The 28-item SMS is ranked on 7-point Likert scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly). It consists of seven subscales, with four items each that measure intrinsic motivation (three types: to know, to accomplish things, to experience stimulation), extrinsic motivation (three types of regulation: identified, introjected, external), and amotivation. There are three ways of obtaining SMS scores: 1) score for each subscale is calculated, yielding total seven categories; 2) subscales can be grouped into a broader motivational category, yielding a total of three categories. For example, three subscales namely 'to know', 'to accomplish things', 'to experience stimulation' may be grouped into intrinsic motivation; 3) a self-determination (or relative autonomy) index can be calculated by assigning weights to each subscale score according to the subscale's position on the self-determination continuum.[34] The SMS has been found to have adequate internal reliability while used in young athletes.[35] The 28-item SMS demonstrated an excellent reliability (α=0.955) in the current study.

The AFAQ measures sport-injury-related fear avoidance in athletes as a potential negative psychological barrier to rehabilitation. The scale is ranked on a 5-point Likert scale from 1 (not at all) to 5 (completely agree). Item scores are summed up to obtain total scores. AFAQ has demonstrated a good internal and external validity, and concurrent validity with both the fear avoidance belief questionnaire (FABQ) and the pain catastrophising scale (PCS).[36] The 10-item AFAQ scale had an excellent reliability (α=0.9) in the current study.

Data was analysed using SPSS v20. Frequencies and percentages were used to present qualitative variables, and means and standard deviations were used to measure quantitative variable. Moreover, total and subscale scores for the questionnaires were calculated as mean and standard deviation.

Results

Of the 403 students participating in the Sports Week, injuries were reported by 127(31.51%) students. The mean age of the injured students was 20.79±1.39 years. Demographic and health data of the subjects was noted (Table-1). Regular physical activity was reported by only 28(22%) participants.

Table-1: Demographic data of the participants (n=127).

Variable	Category	Frequency	%
Semester	First	13	10.2
	Third	28	22.0
	Fifth	27	21.3
	Seventh	40	31.5
	Ninth	19	15.0
Programme	MBBS	54	42.5
	DPT	44	34.6
	PharmD	26	20.5
	BSN	3	2.4
Nationality	Pakistani	126	99.2
	Sri Lankan	1	0.8
Barriers to sports participation	Study	115	90.6
	Conflicts	3	2.4
	Time Management	1	0.8
	Unfit	1	0.8
	Not interested	7	5.5
Age (years)	18-24	Mean: 20.79	SD: 1.39
Body mass index (BMI)	16.2-35	Mean: 22.35	SD: 3.30
	Underweight	13	10.2
	Normal	64	50.4
	Overweight	40	31.5
	Obesity	10	7.9
Prior participation in sports	Yes	85	66.9
	No	42	33.1
Regular physical activity	Yes	28	22.0
	No	99	78.0

MBBS: Bachelor of Medicine and Bachelor of Surgery; DPT: Doctor of Physical Therapy; PharmD: Doctor of Pharmacy; BSN: Bachelor of Science in Nursing; SD: Standard deviation.

Overuse was the most common cause of sports injuries 67(52.8%). Ankle was the main affected site 31(24.4%). The most common injury types were cramps 59(46.5%) and sprains 58(45.7%). Use of improper technique was observed in 61(48%) students. The type of sports in which injuries occurred and the reasons of injuries as well as comments about the physiotherapy camp were also noted (Table-2). The most common intrinsic motives were 'enjoyment', with a mean value of 21.3±2.71, and 'to know' 21.71±5.2. The most common extrinsic motives were 'physical condition', with a mean value of 21.51±2.81, and 'identified regulation' 21.74±5.6. Overall, students were intrinsically motivated to participate in sports, with a mean value of 64.22±13.98, and they demonstrated higher fear avoidance with a mean score of 27.13±10.15 (Table-3).

Table-2: Characteristics and details of the sports injuries in students.

Variable	Category	Frequency	%
Causes of injury	Direct Contact	49	38.6
	Fall on the ground	11	8.7
	Overuse	67	52.8
Type of sports	Throw Ball	27	21.3
	Hand Ball	12	9.4
	Athletics	1	0.8
	Basket Ball	10	7.9
	Cricket	28	22.0
	Foot Ball	18	14.2
	Volley Ball	5	3.9
	Cycling	5	3.9
	Indoor (Table Tennis, Badminton)	11	8.7
	Mix	10	7.9
Site of injury	Shoulder	11	8.7
	Elbow	13	10.2
	Wrist	12	9.4
	Hand	16	12.6
	Back	16	12.6
	Knee	21	16.5
	Ankle	31	24.4
	Foot	4	3.1
	Head	3	2.4
Type of injury	Cramp	59	46.5
	Sprain	58	45.7
	Strain	6	4.7
	Fracture-Dislocation	2	1.6
	Contusion	2	1.6
Risk factors for injury	Improper Technique	61	48.0
	Lack of adequate fitness	22	17.3
	No warm-up	12	9.4
	Unsuitable Environment	16	12.6
	Others	16	12.6
Warm-up	Yes	15	11.8
	No	112	88.2
Time of injury	Practice	37	29.1
	Competition	85	66.9
	Mix	5	4.0
Use of self-medications	Analgesic Gel	79	62.2
	Analgesic Spray	2	1.6
	First Aid	1	0.8
	Analgesic Medicines	1	0.8
	None	44	34.6
Satisfaction level	Dissatisfied	1	0.8
	Neutral	15	11.8
	Satisfied	111	87.4
Access type	Direct	122	96.1
	Outpatient department	5	3.9
Duration of practice (minutes)	Range: 0-90	Mean: 10.32	SD: 11.86
Treatment Sessions	Range: 1-4	Mean: 1.17	SD: 0.49

SD: Standard deviation.

Table-3: Scale and subscale scores of the participants for PALMS, SMS-28 and AFAQ.

Scale	Subscale	Mean±SD (min-max)
PALMS	Total scores	159.21±20.43 (106-200)
	Mastery	21.19±2.78 (14-25)
	Enjoyment	21.30±2.71 (12-25)
	Psychological Condition	20.55±3.18 (13-25)
	Physical Condition	21.51±2.81 (13-25)
	Appearance	19.78±3.97 (10-25)
	Others' Expectations	17.01±4.42 (8-25)
	Affiliation	19.29±3.38 (9-25)
	Competition/Ego	18.44±3.97 (9-25)
SMS	Total scores	143.70±31.55 (28-192)
	Intrinsic motivation - to know	21.71±5.20 (4-28)
	Intrinsic motivation - to accomplish	21.27±5.03 (4-28)
	Intrinsic motivation - to experience stimulation	21.30±4.57 (4-28)
	Intrinsic motivation	64.22±13.98 (12-84)
	Extrinsic motivation - identified regulation	21.74±5.60 (4-28)
	Extrinsic motivation - introjected regulation	21.18±5.08 (4-28)
	Extrinsic motivation - external regulation	19.28±5.27 (4-28)
	Extrinsic motivation	62.20±14.84 (12-82)
	Amotivation	17.22±6.20 (4-28)
AFAQ	Total score	27.13±10.15 (10-50)

PALMS: Physical Activity and Leisure Motivation Scale; SMS: Sport Motivation Scale; AFAQ: Athlete Fear Avoidance Questionnaire.

Discussion

Sports participation is a good means of improving PA, especially in young women. Moreover, motivation serves as an important elucidating factor for active lifestyle and sports participation.[20] In the current study, almost one in every three individuals suffered an injury during sports. Moreover, regular PA was performed by fewer than a quarter of the participants. In more than half of the participants, overuse was the most common cause, and cramps and sprains were the most common injury types. The most commonly affected joints were ankle and knee, and it was noticed that most of the students did not perform warm-up before participating in sports. The most common motives for students to participate in PA and sports were intrinsic and mind-body-related extrinsic motives. Moreover, students demonstrated higher signs of fear avoidance related to sports injury.

The prevalence of sports injuries in the current study was 31.5%. These findings are corroborated by studies from the United States, New Zealand, and Scotland, with approximately 30% prevalence, but lower than those from Turkey (60%), Netherlands (66.6%), India (73.4%) and Canada (91%).[14-16,18] The differences may be attributed to the differences in the sample characteristics, sample size, and setting and duration of the study. Moreover, according to the findings of epidemiological studies, the rates of athletic injuries during international competitions

ranges from 10% to 65%.[37] Although there are several barriers to sports and PA participation; particularly for females, medical education itself is highly demanding and stressful, requiring long hours of studies and work schedules.[1,28] Study commitments were the most common barrier (90.6%) for sports participation in the current study. According to the findings of Gaston-Gayles, sports participation was negatively correlated with grade point averages (GPAs) in college students.[38] However, there are studies suggesting that women participate in sports for relieving stress and improving their mental health.[39] Despite this, regular PA was reported in 22% of the participants in the current study. These findings are supported by the results of Hasse et al, who reported in their study on university students of 23 countries, that only 19% females were involved in PA during leisure time.[8] Noticeably, previous studies suggest that women, particularly female university students, have lower rates of PA.[7] Likewise, overweight and obesity was observed in 39.4% students in the current study. Therefore, emphasis should be placed over PA and sports participation, especially in females, as it leads to increased body image, self-esteem, and favourable anthropometric characteristics.[2,13]

Repetitive stress during athletic activities or acute trauma leads to sports injuries. In most cases, injuries of this type are because of overuse of a part of the body while participating in an activity.[14] Overuse was the most common cause of injuries to the participants in the current study. These findings are corroborated by previous studies.[15,16] The most common sites of injury were ankle and knee. Previous studies in female university students support these findings.[14-16,40] Moreover, evidence suggests that lower limb is the most affected site during sports participation.[16,17] According to a systemic review, approximately 25% of all sports injuries affect the ankle.[41] Another study found that 60% of acute or traumatic injuries such as sprains or factures occurred during team sports.[16] The leading types of injuries in the current study were cramps and sprains. Previous evidence suggests that sprains are very common in sports but cramps were reported relatively less commonly.[14,15,17,40] This difference may be due to the fact that 88.2% students in the current study did not perform warm-up exercises before participating in sports. Moreover, geographical, nutritional and demographic differences may also be attributed to these differences. A competitive environment is more likely to contribute to injuries, and most of the injuries (66.9%) in female students in this study occurred during competition. This finding is supported by evidence from previous studies suggesting higher rates of injuries during competition compared to practice sessions.[42] The most common risk factor for injuries, in the current study, was the use of improper technique. This finding is supported by a study suggesting that 46% injuries were due to improper sporting technique.[37] This fact highlights the importance of inclusion of sports and exercise medicine in undergraduate training, which is common in European and developed countries, but is a far less heard concept in developing countries.[43,44]

Studies suggest that the reasons for sports participation and non-participation are multiple and diverse.[23,45] In general, students in the current study were more intrinsically motivated by the most common motives, namely 'enjoyment' and 'to know' (learning, exploration and curiosity). Biddle et al have reported significant gender differences concerning importance of enjoyment as a motivation for PA.[24] In this context, a study suggests that females report that enjoyment is an important motivator for both exercise and sports.[46] The most common extrinsic motives for the participants in this study were body-mind-related (physical condition) and internally regulated (identified regulation). According to Egli et al., female students are driven by extrinsic motives, such as physical appearance and body weight control.[25] Safania et al in a large-scale study on 2716 female students found that the major motivational factors for them to participate in sports included having fun and experiencing joy, having a healthy body, and becoming fit.[47] Studies suggest that extrinsic motives are important during the initial steps of PA adoption but intrinsic motives are essential for PA maintenance.[31] Moreover, intrinsic motives play a key role in long-term adherence during exercise programmes.[39] Concerning this, findings of Molanorouzi et el suggest that females are more motivated by physical appearance and physical condition than their counterparts.[31] Therefore, female university students should be provided with opportunities and facilities to engage in sports and exercise in order to maintain their existing PA level.

We noticed higher scores for pain avoidance behaviour in the students. Several emotional and cognitive factors are responsible for the gender differences in the experiences of pain and reactions to such experiences.[48] Generally, response to pain and painful experiences in females is manifested in the form of anxiety, sensitivity, catastrophising, and depressive symptoms.[49] Moreover, responses to painful stimuli in females may come in the form of irritation/worry and increased sensitivity.[48,49] Evidence suggests that the feminine gender may have increased vulnerability to chronic pain conditions in

future.[50] Therefore, response to pain during sports injuries may likely play essential role in females. Future research on this topic is recommended.

To the best of our knowledge, this is the first study from Pakistan exploring prevalence, motivation, fear avoidance, and other factors for PA and sports participation by female university students from a rural setting in Pakistan. However, this study has some limitations that should be addressed. The sample characteristics, such as small size and convenience technique, single-centre setting, and inclusion of one gender limits the generalisability of the findings. Future studies are recommended that may address these limitations.

Conclusion

There was a high prevalence of sports injuries in female university students. Lack of PA and inappropriate way of participation in sports suggest that the students should be trained about this in their curriculum. Moreover, intrinsically motivated students should be provided facilities and opportunities to participate in sports and enjoy its health benefits. Higher educational institutions should consider encouraging PA participation in their graduates through sporting activities. Moreover, availability of graduate sports rehabilitator or a certified athletic trainer should also be ensured.

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References

1. Nxumalo S, Edwards S. Attitudes of female university students towards participation in sports. Afr J Phys Act Health Sci. 2017; 23: 226-40.
2. Pacheco LA, Mas FS, Olivárez A, Avila M. Motivational factors related to female participation in collegiate sports. J Hum Sport Exe. 2012; 7:783-93.
3. Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U, et al. Global physical activity levels: surveillance progress, pitfalls, and prospects. Lancet. 2012; 380:247-57.
4. Li C, Zayed K, Muazzam A, Li M, Cheng J, Chen A. Motives for exercise in undergraduate Muslim women and men in Oman and Pakistan compared to the United States. Sex Roles. 2015; 72:68-84.
5. Janse van Rensburg C, Surujlal J. Gender differences related to the health and lifestyle patterns of university students. Health SA Gesundheit. 2013; 18:1-8.
6. del Pilar Vílchez M, De Francisco C. Reduced Spanish Version of Participation Motives Questionnaire for Exercise and Sport: Psychometric Properties, Social/Sport Differences. J Sports Sci Med. 2017; 16:365-74.
7. Tirodimos I, Georgouvia I, Savvala TN, Karanika E, Noukari D. Healthy lifestyle habits among Greek university students: differences by sex and faculty of study. East Mediterr Health J. 2009; 15:722-8.
8. Haase A, Steptoe A, Sallis JF, Wardle J. Leisure-time physical activity in university students from 23 countries: associations with health beliefs, risk awareness, and national economic development. Prev Med. 2004; 39:182-90.
9. Mirsafian H, Dóczi T, Mohamadinejad A. Attitude of Iranian female university students to sport and exercise. Iran Stud. 2014; 47:951-66.
10. Chen C, Tsai LT, Lin CF, Huang CC, Chang YT, Chen RY, et al. Factors influencing interest in recreational sports participation and its rural-urban disparity. PLoS One. 2017; 12:e0178052.
11. Jefferis BJ, Sartini C, Lee IM, Choi M, Amuzu A, Gutierrez C, et al. Adherence to physical activity guidelines in older adults, using objectively measured physical activity in a population-based study. BMC Public Health. 2014; 14: 382.
12. Jafar TH, Chaturvedi N, Pappas G. Prevalence of overweight and obesity and their association with hypertension and diabetes mellitus in an Indo-Asian population. CMAJ. 2006; 175:1071-7.
13. Dunsky A, Zach S, Zeev A, Goldbourt U, Shimony T, Goldsmith R, et al. Level of physical activity and anthropometric characteristics in old age - results from a national health survey. Eur Rev Aging Phys Act. 2014; 11:149-57.
14. Kumar V, Mangal A, Yadav G, Raut DK, Singh S. Prevalence and pattern of sport injuries among college students in Delhi, India. Saudi J Sports Med. 2014; 14:109-14.
15. van Beijsterveldt AM, Richardson A, Clarsen B, Stubbe J. Sports injuries and illnesses in first-year physical education teacher education students. BMJ Open Sport Exerc Med. 2017; 3:e000189.
16. Lemoyne J, Poulin C, Richer N, Bussières A. Analyzing injuries among university-level athletes: prevalence, patterns and risk factors. J Can Chiropr Assoc. 2017; 61:88-95.
17. Nunes GS, Haupenthal A, Karloh M, Vargas VZ, Haupenthal DPdS, Wageck B. Sport injuries treated at a physiotherapy center specialized in sports. Fisioterapia em Movimento. 2017; 30:579-85.
18. Bakar C, Cevizci S, Gündo?ar D, I?in H, Karaman Ö. Prevalence of unintentional injuries and related risk factors among university students in Canakkale city, western Turkey. Cent Eur J Public Health. 2014; 22:189-96.
19. Cross PS, Karges JR, Salsbery MA, Smith D, Stanley EJ. Management of acute sports injuries and medical conditions by physical therapists: Assessment via case scenarios. Int J Sports Phys Ther. 2011; 6:158-72.
20. Haerens L, Kirk D, Cardon G, De Bourdeaudhuij I, Vansteenkiste M. Motivational profiles for secondary school physical education and its relationship to the adoption of a physically active lifestyle among university students. Eur Phy Educ Rev. 2010; 16:117-39.
21. Sindik J, Mandic GF, Schiefler B, Kondric M. Differences in the structure of motivation for participation in sport activities among sport students in three countries. Kinesiologia Slovenica. 2013; 19:14-31.
22. Cerar K, Kondri? M, Sindik J. The profiling of university of Ljubljana students according to their motives for exercise participation. Zdr Varst. 2017; 56:107-14.
23. Kondric M, Sindik J, Furjan-Mandic G, Schiefler B. Participation motivation and student's physical activity among sport students in three countries. J Sports Sci Med. 2013; 12:10-18.
24. Biddle SJ, Atkin AJ, Cavill N, Foster C. Correlates of physical activity in youth: a review of quantitative systematic reviews. Int Rev Sport Exerc Psychol. 2011; 4:25-49.
25. Egli T, Bland HW, Melton BF, Czech DR. Influence of age, sex, and

race on college students' exercise motivation of physical activity. J Am Coll Health. 2011; 59:399-406.
26. Mirsafian H, Mohamadinejad A, Homaei R, Hédi C. Motivations of Iranian University students for participation in sporting activities. Phys Culture Sport Stud Res. 2013; 59:42-8.
27. Dagkas S, Benn T. Young Muslim women's experiences of Islam and physical education in Greece and Britain: a comparative study. Sport Educ Soc. 2006; 11:21-38.
28. Mirsafian H. Perceived constraints to physical activity and sport: a cross-cultural study between Iranian and Hungarian university students. World Leis J. 2016; 58:193-206.
29. Craike MJ, Symons C, Eime RM, Payne WR, Harvey JT. A comparative study of factors influencing participation in sport and physical activity for metropolitan and rural female adolescents. Annal Leis Res. 2011; 14:355-68.
30. Morris T, Rogers H. Sport and Chance of Life: International Sport Science Congress Seoul. Kansas Assoc Health Phys Educ Recr Dance. 2004; 4:242-50.
31. Molanorouzi K, Khoo S, Morris T. Motives for adult participation in physical activity: type of activity, age, and gender. BMC Public Health. 2015; 15:66.
32. Brière NM, Vallerand RJ, Blais MR, Pelletier LG. Développement et Validation d'une Mesure de Motivation Intrinsèque, Extrinsèque et d'Amotivation en Contexte Sportif: L'Échelle de Motivation dans les Sports (ÉMS). Inter J Sport Psychol. 1995; 26:465-89.
33. Pelletier LG, Sarrazin P. Measurement issues in self-determination theory and sport. In: Hagger M, Chatzisarantis N, eds. Intrinsic motivation and self-determination in exercise and sport. IL, US: Human Kinetics. 2007; pp 331-4.
34. Clancy RB, Herring MP, Campbell MJ. Motivation Measures in Sport: A Critical Review and Bibliometric Analysis. Front Psychol. 2017; 8:348.
35. Rottensteiner C, Tolvanen A, Laakso L, Konttinen N. Youth athletes' motivation, perceived competence, and persistence in organized team sports. J Sport Behav. 2015; 38:432-49.
36. Dover G, Amar V. Development and validation of the athlete fear avoidance questionnaire. J Athl Train. 2015; 50:634-42.
37. Saragiotto BT, Di Pierro C, Lopes AD. Risk factors and injury prevention in elite athletes: a descriptive study of the opinions of physical therapists, doctors and trainers. Braz J Phys Ther. 2014; 18:137-43.
38. Gaston-Gayles JL. Examining academic and athletic motivation among student athletes at a Division I university. J Coll Stud Dev. 2004; 45:75-83.
39. Zervou F, Stavrou NA, Koehn S, Zounhia K, Psychountaki M. Motives for exercise participation: The role of individual and psychological characteristics. Cogent Psychol. 2017; 4:1-12.
40. Ray MJ, Kohandel M. Epidemiology of some sport injuries among physical education college students. Inj Prev. 2010; 16:A128-9.
41. Fong DT, Chan YY, Mok KM, Yung PS, Chan KM. Understanding acute ankle ligamentous sprain injury in sports. Sports Med Arthrosc Rehabil Ther Technol. 2009; 1:14.
42. Karges JR, Cross PS, Hauer PL, Blom H, Burcham J, Myers AK, et al. Effectiveness of the emergency response course in improving student physical therapists'and licensed physical therapists' decision making related to acute sports injuries and medical conditions.Int J Sports Phys Ther. 2013; 8:277-89.
43. Jaques R, Loosemore M. Sports and exercise medicine in undergraduate training. Lancet. 2012; 380: 4-5.
44. Kordi R, Moghadam N, Rostami M. Sports and exercise medicine in undergraduate medical curricula in developing countries: a long path ahead. Med Educ Online. 2011; 16.
45. Biddle SJ, Wang CJ, Chatzisarantis NL, Spray CM. Motivation for physical activity in young people: Entity and incremental beliefs about athletic ability. J Sports Sci. 2003; 21:973-89.
46. Kilpatrick M, Hebert E, Bartholomew J. College students' motivation for physical activity: differentiating men's and women's motives for sport participation and exercise. J Am Coll Health. 2005; 54:87-94.
47. Safania A. Study on the leisure time of Islamic Azad University female students and the role of sports in spending such time (Baresi vaziat oghat feraghat daneshjoyan dokhtar daneshgahai azad va naghsh varzesh dar an). Harakat. 2001;9:127-40.
48. Cremeans-Smith JK. Fear of pain and the frequency with which healthy individuals engage in physical activity. [Online] [Cited 2016 Sep 14]. Available from: URL: https://doi.org/10.1080/1612197X.2016.1230639.
49. Fillingim RB, King CD, Ribeiro-Dasilva MC, Rahim-Williams B, Riley JL. Sex, gender, and pain: a review of recent clinical and experimental findings. J Pain. 2009; 10:447-85.
50. Bernardes SF, Keogh E, Lima ML. Bridging the gap between pain and gender research: A selective literature review. Eur J Pain. 2008; 12:427-40.