



PAMUKKALE JOURNAL OF SPORT SCIENCES

dergipark.org.tr/en/pub/psbd

ISSN: 1309-0356

Year: 2022 Volume: 13 Number: 2

Pamukkale University
Faculty of Sport Sciences
Turkey



PAMUKKALE JOURNAL OF SPORT SCIENCES

Pamukkale Spor Bilimleri Dergisi

Volume: 13 Issue:2 Year: 2022
ISSN: 1309-0356

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Social Distancing and Quality of Life Among Candidates for the Sports Science Degree During the Covid-19 Pandemic

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ABSTRACT

Keywords
Candidate student,
COVID-19,
Quality of life,
Social distance,
Sports sciences

Article History
Received 08 March 2022
Revised 28 July 2022
Accepted 05 August 2022
Available Online 29 August 2022

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This study aimed to examine the relationship between the level of compliance with COVID-19 social distancing measures and the COVID-19 impact on the quality of life of the candidate students in the Faculty of Sports Sciences, based on their gender, whether they are athletes or non-athletes, and whether they are individual athletes or team athletes. The study included 1083 candidate students, including 364 females and 719 males. The Social Distancing Scale and the COVID-19 Impact on Quality of Life Scale were used to collect data. The results showed that the degree of compliance with COVID-19 social distancing measures between athletes and non-athletes was also discovered to differ in favor of non-athletes; and the COVID-19 impact on the quality of life of athletes and non-athletes was similar, being below the average. The level of compliance with COVID-19 social distancing measures in individual or team athletes was higher, and the negative impact of COVID-19 on the quality of life of both groups was below the average. There was no relationship between the level of compliance with COVID-19 social distancing measures and the COVID-19 impact on the quality of life of athletes, and there was a weak negative relationship between the level of compliance with COVID-19 social distancing measures and the quality of life of non-athletes. Because these findings show that people who engage in movement and sports are less affected by COVID-19-related negatives, it is essential not to restrict people's movement and sports activities while taking precautions for COVID-19 and similar emergencies.

INTRODUCTION

The COVID-19 pandemic has caused changes in almost every field, from social life to the economy, from health to education, in more than 200 countries since its emergence in December 2019 (Ciotti et al., 2020; Daniel, 2020; Hamid et al., 2020; Phelps & Sperry, 2020; Yalnız et al., 2020). Governments have taken various measures to prevent or slow down the spread of COVID-19 in meetings, travel, sports competitions, recreational activities, workplaces, and schools (Ward, 2020). One of these measures taken is the "social distance," which everyone is expected to follow during the COVID-19 pandemic. The concept of "social distance," which began to be used more as a method of protection from pandemic with the spread of COVID-19, has been defined as the physical distance of approximately two meters between two or more individuals in order to prevent the airborne droplets from passing to another person (Centers for Disease Control and Prevention, 2022; Özşenler, 2021; Sun & Zhai, 2020).

With the COVID-19 pandemic, it has become obligatory to comply with these social distance measures in areas where people do activities based on movements, such as sports, physical activity, and exercise (Carmody et al., 2020; Varea et al., 2022). Although various studies have shown that physical activity is attempted to be maintained in places such as homes, workplaces, and isolated sports fields during the COVID-19 pandemic (Mutz et al., 2021; Ravalli & Musumeci, 2020), it is emphasized that COVID-19 restrictions negatively affected the duration or quality of physical activity causing people to be more inactive than before the pandemic (Wilke et al., 2021; Yeo, 2020).

Studies have shown that this state of inactivity, which emerged with the COVID-19 pandemic, adversely affects the quality of life of individuals physically, mentally, socially, and emotionally (Evans et al., 2020; Mutz & Gerke, 2021; Ratten, 2020; Schinke et al., 2020). Although limited, studies examining how the COVID-19 social distancing measures applied almost all over the world during the COVID-19 pandemic and the effect of COVID-19 on people's quality of life differ in different genders, athletes and non-athletes, team athletes, and individual athletes stand out in the literature. In one of these studies, Graupensperger et al. (2020) conducted a study with the participation of 234 university-level student-athletes and found that the COVID-19 social distancing measures increased the depression tendencies of student-athletes; however, female student-athletes were more concerned about social distancing measures than male student-athletes. In the study conducted with the participation of over 13.000 student-athletes in the USA, it was reported that female athletes were affected

more negatively than male athletes by the measures taken due to the COVID-19 pandemic; female athletes showed more severe anxiety and depression symptoms than male athletes; and team athletes showed more severe anxiety and depression symptoms than individual athletes (McGuine et al., 2021a). Apart from all these groups interested in sports and physical activity, there are candidate students who want to register and study in higher education institutions in the field of Sports Sciences (Physical Education Teacher Education, Sport Management, Coaching Education, and Recreation), which accept students who are successful in the special talent exam, and who train for this purpose were also adversely affected by the COVID-19 pandemic. Although the candidates applying for the special talent exam in the field of sports sciences have not yet been qualified to receive education in one of the relevant field departments, it can be said that they are motivated to study in the relevant departments and they apply with this motivation (Toprak & Saraç, 2014). These candidates, who apply for the special talent exam, are appointed to professions such as physical education teachers, trainers, sports managers, and sports specialists after graduating from sports science departments. It is also emphasized that sports scientists take responsibility for the protection and improvement of the public health of individuals, the dissemination of physical education and sports to large masses, training of talented students in the country's sports, and they are managers in sports institutions in the country (Karademir et al., 2010). In the preparation process for the special talent exam that will shape their future (a process that takes months and sometimes years), it is a matter of curiosity how much this group complies with the COVID-19 social distancing measures and the COVID-19 impact on their quality of life.

As a result of the related literature review, it has been determined that the studies focusing on the relationship between the level of compliance with COVID-19 social distancing measures and the COVID-19 impact on the quality of life of the candidate sports scientists were limited. Considering the restrictions due to the COVID-19 epidemic and the possibility of transmission, participating in various movement activities by observing social distance in sports facilities, although various difficulties arise for individuals, those who will take a physical performance-based exam such as a special talent exam, have overcome these difficulties and continued their training. It highlights the significance of the study, which will inform decision-makers who take the necessary precautions in the field of sports and will reveal the extent to which those taking part in these required movement activities during the COVID-19 process comply with the social distance and the degree to which this situation affects their quality of life. Therefore, it was thought that it would be important to examine the relationship between the level of compliance with COVID-19 social distancing measures and

the COVID-19 impact on the quality of life in the field of sports sciences. The purpose of this study, which was conducted within the context of the related literature, was to examine the relationship between the level of compliance with COVID-19 social distancing measures and the quality of life of candidate students in the Faculty of Sports Sciences, according to their gender, athletic license status, and team or individual, whether they are licensed athletes or non-athletes, and whether they are individual athletes or team athletes.

METHODS

Research Design

This study used a cross-sectional descriptive research design and self-reported data collection tools in examining the relationship between the level of compliance with COVID-19 social distancing measures and their COVID-19 impact on the quality of life of candidate students in the Faculty of Sports Sciences.

Study Group

The participants of this study were candidate students who registered for the Special Talent Examination of Physical Education and Sports Teaching, Coaching Education, Sports Management, and Recreation departments at the Faculty of Sports Sciences for the 2021-2022 academic years. Of the 1083 participants, 33.6% were females and 66.4% were males; 36.2% were licensed athletes and 63.8% were non-athletes; 29.87% were individual athletes, and 70.13% were team athletes. All participants admitted to the study were 18 years of age or older. The mean ages of participants were 19.16 (SD = 1.31), and 18.96 (SD = 1.16) years for females, and 19.27 (SD = 1.38) years for males, respectively.

Data Collection Tools

Demographic Information Form

In the study, the researcher-designed Demographic Information Form, which included questions about gender (female and male), age, whether they were licensed athletes or non-athletes (have an athlete license and have no athlete license), and the sports branches of licensed athletes (athlete of an individual sport or team sports), was used.

The Social Distancing Scale

In order to examine whether the participants in the research comply with COVID-19 social distancing measures, the Social Distance Scale (SDS), which was developed by Van Rooij et al. (2020) and translated into Turkish by Oral and Günlü (2021), was used. The SDS consisted of four items, with each item rated on a 5-point self-administered Likert scale: never (1), rarely

(2), sometimes (3), often (4), and always (5). On the scale, the participants were asked to indicate their level of agreement or disagreement with each item. The total SDS score is calculated by summing the scores of the four items. The lowest score that can be obtained from the scale is 4 and the highest score is 20. The high score that an individual will get on the scale is considered an indication that the participant complies with COVID-19 social distancing measures. Oral and Günlü (2021) calculated Cronbach's Alpha reliability coefficient of the scale to be .70. The reliability coefficient obtained in this study is .66.

The COV19-Impact on Quality of Life

The Turkish version of the COV19-Impact on Quality of Life (COV-19-QoLTR) was used to measure participants' perception of the impact of the COVID-19 pandemic on their quality of life. The COV-19-QoLTR was developed originally by Repisti et al. (2020) and translated into Turkish by Sümen and Adıbelli (2021). The scale consists of six items, which cover basic areas of quality of life related to the mental health of individuals. Each item on the scale was measured using a 5-point Likert-type scale that ranged from 1 to 5 (1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree). An overall COV-19-QoLTR is calculated by adding up the scores of the individual items, all the items scored, and dividing the score by six. The scale has a minimum score of one and a maximum score of five. High scores on the scale indicate that COVID-19 affects the quality of life of individuals more negatively. Results of the reliability test carried out on different samples showed Cronbach's coefficient alpha for COV-19-QoLTR was .91, .91, and .86 (Sümen & Adıbelli, 2021). The reliability coefficient was also calculated for this study, and Cronbach's alpha was found to be .89.

Data Collection Procedures

Before the study, Ethical approval was obtained from the Social Sciences and Humanities Research Ethics Committee, and additional permission was obtained from the board of the Faculty of Sports Sciences. All the eligible participants were fully informed about the study and asked to participate in it voluntarily. Participants were approached in the area where they came to register for the Special Talent Examination of the Faculty of Sports Sciences, and the data was collected before their registration. Researchers were present in the data collection area during the data collection phase in order to answer any possible questions that participants might have about the study or data collection instruments. The data collection tools were self-administered and took about seven minutes to complete.

Data Analysis

The statistical computer package IBM SPSS, Version 20 was used to perform a quantitative analysis of the collected data. As the data collected did not follow a normal distribution, a nonparametric Mann-Whitney U test was used to compare the SDS and COV-19-QoLTR scores from two groups (gender: female and male; possession of a license: licensed athlete and non-athlete; and the sports branches of licensed athletes: individual athlete and team athlete). In addition, the Spearman rank correlation coefficient was used to identify the association between SDS and COV19-QoLTR scores. The significance level was set at 0.05.

RESULTS

The results of the Mann-Whitney U test applied to determine whether there was a statistically significant difference between the SDS scores of female and male candidate students on the Faculty of Sports Sciences Special Talent Exam revealed that there was no statistically significant difference between the two groups, $U = 128940.50$, $p = .69$. These findings revealed that the SDS scores of female ($\bar{x} = 14.49$) and male ($\bar{x} = 14.46$) candidates were similar and found to be higher than the average score of the SDS Scale (range 4-20) (Table 1).

Similarly, the results of the Mann-Whitney U test, which was applied to determine whether there was a difference between the COV-19-QoLTR scores of female and male candidates, revealed that there was no statistically significant difference, $U = 123449.00$, $p = .13$. The results of the analysis revealed that the COV-19-QoLTR scores of female ($\bar{x} = 2.34$) and male ($\bar{x} = 2.42$) candidates were similar and below the average (Table 1).

Table 1. Comparison of SDS and COV19-QoLTR Scores According to the Gender of the Participants

		<i>N</i>	\bar{x}	<i>SD</i>	<i>Med.</i>	<i>U</i>	<i>z</i>	<i>p</i>
SDS	Female	364	14.49	2.82	15.00	128940.50	-.40	.69
	Male	719	14.46	2.89	15.00			
COV-19-QoLTR	Female	364	2.34	1.06	2.17	123449.00	-1.53	.13
	Male	719	2.42	1.00	2.33			

$p < .05$

The Mann-Whitney U test, which was used to see if there was a difference between the SDS scores of the licensed athletes and non-athletes, revealed a statistically significant difference between the two groups, $U = 121983.00$, $p = .01$. According to the findings, non-athletes had higher SDS scores ($\bar{x} = 14.65$) than licensed athletes ($\bar{x} = 14.15$) (Table 2).

However, the results of the Mann-Whitney U test, which was applied to determine whether there was a difference between the scores on COV-19-QoLTR of licensed athletes and

non-athletes participating in the research, revealed that there was statistically no significant difference between athletes ($\bar{x}= 2.39$) and non-athletes ($\bar{x}= 2.39$), $U= 134341.50$, $p= .83$ (Table 2).

Table 2. Comparison of SDS and COV19-QoL_{TR} Scores According to the Athletic License Status of the Participants

		N	\bar{x}	SD	Med.	U	z	p
SDS	Licensed athletes	392	14.15	2.94	14.00	121983.00	-2.74	.01
	Non-athletes	691	14.65	2.80	15.00			
COV-19-QoL _{TR}	Licensed athletes	392	2.39	1.00	2.33	134341.50	-.22	.83
	Non-athletes	691	2.39	1.04	2.26			

$p < .05$

The results of the Mann-Whitney U test, which was conducted to determine whether there is a difference in SDS scores according to the status of being an individual or team athlete, showed that there was no statistically significant difference between the two groups, $U= 16356.00$, $p= .80$. According to these findings, the SDS scores of the candidates who are individual athletes ($\bar{x}= 14.09$) and those who are team athletes ($\bar{x}= 14.18$) were similar, and above the average.

Similarly, the results of the Mann-Whitney U test were applied to determine whether there was a difference between the COV19-QoL_{TR} scores of licensed individual athletes ($\bar{x}= 2.29$) and licensed team athletes ($\bar{x}= 2.43$) revealed that there was statistically no significant difference between the two groups, $U= 15315.00$, $p= .21$ (Table 3).

Table 3. Comparison of SDS and COV19-QoL_{TR} Scores According to the Status of an Individual Athlete or a Team Athlete

		N	\bar{x}	SD	Med.	U	z	p
SDS	Individual athlete	124	14.09	2.96	14.00	16356.00	-.08	.80
	Team athlete	268	14.18	2.94	15.00			
COV-19-QoL _{TR}	Individual athlete	124	2.29	.99	2.17	15315.00	-1.25	.21
	Team athlete	268	2.43	1.00	2.33			

$p < .05$

A Spearman rank correlation coefficient analysis was used to examine the relationship between SDS and COV19-QoL_{TR} scores of the candidates. The datasets of the licensed athletes and non-athletes were analyzed separately, as statistically significant differences were found between the SDS scores of these two groups of participants. The results of the analysis revealed that there was a statistically no significant relationship between the SDS and COV19-QoL_{TR} scores of licensed athletes, $r_s= -.096$, $p= .06$ (Table 4).

In addition, as a result of the analysis, a statistically weak negative relationship between non-athletes' SDS and COV19-QoL_{TR} scores was noted, $r_s= -.217$, $p= .001$ (Table 4).

Table 4. The Correlation Between SDS and COV19-QoL_{TR} Scores of Licensed Athletes and Non-Athletes

Licensed athletes	Correlations	COV19-QoL _{TR}
SDS	<i>Spearman Correlation</i>	-.096
	<i>P</i>	.056
	<i>N</i>	392
Non-athletes		
SDS	<i>Spearman Correlation</i>	-.217*
	<i>P</i>	.001
	<i>N</i>	691

* $p < .01$

DISCUSSION

In this study, the relationship between the level of compliance with COVID-19 social distancing measures and the quality of life of candidate students in the Faculty of Sports Sciences according to gender, athletic license status, and the status of being an individual or team athlete was explored. The results of the research showed that the level of compliance with COVID-19 social distancing measures of female and male candidates is high, and the effect of COVID-19 on the quality of life of female and male candidates is below the average scale score. Additionally, it has been found that licensed athletes and non-athletes differ in their levels of compliance with COVID-19 social distancing measures, favoring non-athletes, COVID-19 similarly affects the quality of life of licensed athletes and non-athletes below a moderate level. In the study, it was found that the level of compliance with COVID-19 social distancing measures of licensed athletes, who are both team athletes and individual athletes, is high, and the effect of COVID-19 on the quality of life of both groups is below the scale average. It was concluded that there was no relationship between the level of compliance with COVID-19 social distancing measures and the effect of COVID-19 on the quality of life of licensed athletes. However, there was a statistically negative and low-level relationship between the level of compliance with COVID-19 social distancing measures and the effect of COVID-19 on the quality of life of non-athletes.

In this study, it was determined that there was no difference between the level of compliance with COVID-19 social distancing measures of female and male sports sciences degree candidates and that the level of compliance with COVID-19 social distancing measures of both females and males was above the average and high. Since the COVID-19 pandemic spread rapidly all over the world from the moment it emerged and caused severe health problems and death in many people, the World Health Organization (WHO) proposed a series of measures to prevent the spread of the pandemic and invited all countries to comply with

these measures (WHO, 2020). One of the reasons for the high level of compliance with COVID-19 social distancing measures among female and male candidates may be due to their consideration of the WHO's (2020) warnings regarding social distancing. In addition, the fact that people put this rule into practice, believing that one of the most effective ways to protect themselves from the pandemic is to maintain social distance, supports the current study findings (Aslan, 2020). In addition, the literature has also stressed how athletes are concerned about contracting the COVID-19 disease during the pandemic and that, if they do, they won't be able to recover physically (Mehrsafar et al., 2020). The high level of compliance with social distancing measures for COVID-19 of the candidates participating in this study may have resulted from the fear of being infected and the fear of not being able to recover physically if they become infected, as well as the thought that they could endanger the health of other people (McGuine et al., 2021a). The high level of compliance with COVID-19 social distancing measures of the sports sciences degree candidates may be due to their sense of social responsibility towards society and their sensitivity not to endanger other people's lives.

It has been determined that there is no difference between the COVID-19 impact on the quality of life of female and male sports sciences degree candidates, and that the COVID-19 impact on the quality of life of both females and males is below the average. In a study conducted with athletes in the Norwegian sample, it was found that the COVID-19 pandemic reduced the quality of life of athletes (Pensgaard et al., 2021). Similarly, in a study conducted in a Norwegian sample, it was determined that 2205 adolescents aged between 16 and 19 had very low quality of life levels in the period of the COVID-19 pandemic (Riiser et al., 2020). These findings from the literature are not in line with the low level of impact of COVID-19 on the quality of life of female and male participants in this study. Although COVID-19's impact on the quality of life of both female and male athletes is low, studies have shown that the quality of life of individuals who do sports is higher than those who do not do sports (Dahab et al., 2019; Houston et al., 2016; Lam et al., 2013). From the previous related literature, it can be inferred that the low level of COVID-19 impact on the quality of life of female and male participants in this study might be due to their active participation in sports and physical activity during the preparation stage for the special talent exam (Mcguine et al., 2021b).

The research findings have shown that there is a significant difference between the level of compliance with COVID-19 social distancing measures of licensed athletes and non-athletes and that the non-athletes' level of compliance with COVID-19 social distancing measures was found to be higher than licensed athletes. However, it has been reported that the level of compliance with COVID-19 social distancing measures of both licensed athletes

and non-athletes was high. In the studies conducted to support this, it is emphasized that the social distancing measures, which have become the "new normal" during the COVID-19 pandemic, have begun to take place in the lives of all individuals from 7 to 70, and that these measures might become a part of people's lives (Nyenhuis et al., 2020). The high level of compliance with COVID-19 social distancing measures of licensed athletes and non-athletes may be due to the fact that the social distancing measures have become a part of their lives. During the COVID-19 pandemic, sports clubs ensured their athletes trained in isolated environments so that they would be less affected by the negative effects of the pandemic; measured their body temperatures regularly and frequently; ensured that they wore masks during training sessions; and constantly checked the health status of their athletes with digital applications, which were developed to provide information about the COVID-19 related health status, so that their athletes could continue to play sports, do exercise, and healthily cope with life (Aydın, 2020; Ünver et al., 2021). The fact that the candidates who are licensed athletes participating in this research complied with the COVID-19 social distancing measures relatively less than the non-athletes may be due to these reasons. In support of these findings, studies have revealed that professional athletes showed fewer symptoms of depression and less anxiety compared to non-professional athletes during the COVID-19 pandemic (Uroh & Adewunmi, 2021; Di Fronso et al., 2022). Based on the finding that non-professional athletes felt more anxiety and depression during the COVID-19 pandemic, it can be said that the non-athletes in this study, who are thought to have similar conditions, might have paid more attention to the social distancing measures due to these negative feelings.

In this study, it was determined that there was no difference between COVID-19's impact on the quality of life of licensed athletes and non-athletes, and the impact level was below the average for both groups of candidates. Studies have emphasized that there were serious decreases in the quality of life of children, adolescents, adults, and the elderly during the COVID-19 pandemic (Cullen et al., 2020; De Matos et al., 2020; Ferreira et al., 2021; Pfefferbaum & North, 2020; Suryavanshi et al., 2020; Özcan & Saraç, 2021; Zhang & Ma, 2020). These research findings in the literature do not coincide with these research findings. For a long time after the outbreak of COVID-19, people have been required to stay at home with partial or full closure practices for a long period (Ministry of Interior, 2021a). The fact that COVID-19 precautions were reduced (Ministry of Interior, 2021b), and vaccination studies and vaccinations were expedited (WHO, 2021) at the time the research data were collected might have reduced the negative impact of COVID-19 on the participants' quality of life. Furthermore, it has been reported in the study that approximately 96% of the athletes actively

trained during the COVID-19 pandemic, and two-thirds of these athletes carried out their training with professional physical education specialists by adapting them to socially isolated areas (da Silva et al., 2021). The fact that the quality of life of the candidates in this study was less affected during the COVID-19 pandemic may also have resulted from these adaptations.

It has been determined that there is no difference between the level of compliance with COVID-19 social distancing measures of individual athletes and team athletes, and the level of compliance with COVID-19 social distancing measures of both individual athletes and team athletes is above the average. In a study examining the opinions of coaches about the training they offered to their athletes during the COVID-19 pandemic, it was revealed that both individual and team sports coaches changed their training plans in terms of health priority during the COVID-19 pandemic and that the coaches chose to reduce contact as much as possible during the training sessions of the athletes (Aydın, 2020). These findings obtained from the literature explain the high level of compliance with COVID-19 social distancing measures of the candidates who are individual athletes and team athletes. In addition, due to the COVID-19 pandemic being a global health problem, athletes complied with the social distancing measures recommended by health authorities at a high level, considering both their health and the community's health (McGuine et al., 2021a; WHO, 2020).

The current study findings reveal that there is no difference between the COVID-19 impact on the quality of life of individual athletes and team athletes and that the COVID-19 impact on the quality of life of both individual athletes and team athletes is below the average level. In several studies, it has been reported that most athletes altered their training routines with alternative practices and made various adaptations to overcome the difficulties brought by the COVID-19 pandemic (Mehrsafar et al., 2021). This explains the fact that the COVID-19 impact on the quality of life of the athletes participating in this study was relatively less affected during the COVID-19 pandemic. Supporting these findings, the psychologist states that doing sports during the pandemic will make a significant contribution to the improvement of mental health (Kar et al., 2020; Kecmanovic, 2020). It has been reported in research that elite athletes experienced many health problems such as depression, insomnia, and anxiety during the COVID-19 pandemic, and these athletes also needed physical and psychological support both during the COVID-19 pandemic and during the competitions (Ciddi & Yazgan, 2020; Mehrsafar et al., 2021; Pensgaard et al., 2021; Reardon et al., 2021). It is thought that the reason why these results do not coincide with the findings of this research is that the athletes participating in the research are not elite athletes, do not practice sports as a profession, and do not feel financial anxiety.

It has been determined that there is no relationship between the level of compliance with COVID-19 social distancing measures and the COVID-19 impact on the quality of life of the licensed athletes participating in this research. However, as a result of the analysis, it was revealed that there is a weak negative relationship between the level of compliance with COVID-19 social distancing measures and the COVID-19 impact on the quality of life of non-athletes. In the literature, it has been determined that professional athletes show fewer depression and anxiety symptoms during the COVID-19 period than non-professional athletes (Uroh & Adewunmi, 2021; Di Fronso et al., 2022). There was no relationship between the level of compliance with COVID-19 social distancing measures of licensed athletes and the impact of COVID-19 on the quality of life of these athletes, and the weak negative relationship between the compliance with COVID-19 social distancing measures and the COVID-19 impact on the quality of life of the non-athletes can be explained by this situation. In addition, it has been reported that approximately 96% of the athletes actively worked out during the COVID-19 pandemic and adapted their training routines to socially isolated areas (da Silva et al., 2021). These adaptations explain the unrelated findings between the level of compliance with COVID-19 social distancing measures and the negative impact of the COVID-19 pandemic on the quality of life of licensed athletes in this study. In the research, it has been reported that licensed athletes survived the COVID-19 pandemic with less physical and mental discomfort due to the training programs offered by their coaches. The coaches applied training programs that increased the performance of the athletes in accordance with the COVID-19 social distancing measures, and the club managers implemented measures to protect the health of their athletes (Aydın, 2020; Ünver et al., 2021). These findings explain the unrelated level of compliance with COVID-19 social distancing measures and the level of the negative impact of COVID-19 on the quality of life of licensed athletes in this study. The fact that non-athletes continued their training during the COVID-19 pandemic without the guidance and support of coaches and continued their activities by following social distancing rules. These factors explain the weak negative relationship between their level of compliance with COVID-19 social distancing measures and the COVID-19 impact on their quality of life.

CONCLUSION

It has been determined that the level of compliance with COVID-19 social distancing measures of the female and male candidates for the sports sciences degree was high, and the COVID-19 impact on the quality of life of female and male candidates was below the average. It has been concluded that there was a difference in favor of non-athletes between the level of

compliance with COVID-19 social distancing measures of licensed athletes and non-athletes, and that the COVID-19 impact on the quality of life of licensed athletes and non-athletes was similar to the average. According to the status of being an individual or team athlete, the level of compliance with COVID-19 social distancing measures was found to be high, and the COVID-19 impact on the quality of life of these two groups was below the average. In the study, it was also concluded that there was no relationship between the level of compliance with COVID-19 social distancing measures and the COVID-19 impact on the quality of life of the licensed athletes, but there was a weak negative relationship between the level of compliance with COVID-19 social distancing measures and the quality of life of the non-athletes.

Different from this research, research can also be conducted on how the COVID-19 pandemic affects the depression and anxiety levels of individuals in the field of sports sciences. Since student candidates from departments other than the faculty of sports sciences have not experienced the preparation process for the special talent examination, their level of adaptation to COVID-19-related social distancing measures and the impact of the COVID-19 pandemic on their quality of life may be different. Based on this, in future research, the relationship between the level of compliance with COVID-19 social distancing measures and the COVID-19 impact on the quality of life among candidate students in the field of sports sciences and student candidates preparing for other departments can be examined. This research can also be carried out with the participation of sports science majors or with student-athletes studying in other departments. For individuals in the field of physical education and sports to continue their active lives, relevant institutions (municipalities, sports clubs, universities, etc.) should take the necessary precautions and create safe sports environments for cases of COVID-19 and similar situations. In addition, for individuals in the field of physical education and sports to be affected by the COVID-19 pandemic at a minimum level, psychological support can be provided in cooperation with the Ministry of Health to minimize the negative impact on the quality of life of individuals in this field. Physical training practices can be developed in alternative digital formats that individuals in the field of physical education and sports can apply individually and outside of public sports environments (at home or in their personal living spaces) to emergencies like the COVID-19 crisis.

Authors' Contributions

Both authors carried out the research design together. The first author was involved in the data collection process. The second author took responsibility for data analysis and

interpretation of the data. Both authors contributed to the discussion of the results and the manuscript's preparation.

Acknowledgments

None. No funding was received for the preparation of the submitted manuscript.

Declaration of Conflict Interest

The authors have no conflicts of interest to declare.

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Impact Assessment of Sports Medicine Studies on Knowledge Production and Development

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ABSTRACT

In order to justify the investments made in research in the field of sports medicine, the outcomes and impacts of these investments should be assessed. The purpose of this study was to investigate the status and impact of sports medicine studies on the production and development of knowledge. In this descriptive study bibliometric and scientometric methods were used on 1145 scientific productions of sports medicine indexed in the Web of Science database. Data were analyzed through Excel Software, and cooperation maps were drawn using VOSviewer Software. According to the findings, the ratio of citations to the articles on the scientific productions of sports medicine was 23.17, which is higher than the clinical medicine area (6.8). The ratio of citations to the authors was 5.46% and 52 articles (4.54%) of the articles appeared without citations. The average impact factor of journals publishing papers was 3.9. Most of the articles were published with the collaboration of five authors. The results of the present study, based on a selected model and a combination of indicators of the UK's and Canadian Capital Return frameworks (from the production and development dimension), generally highlighted the validity and effectiveness of all indicators, including activity, quality, and development. The results revealed the most significant impact of the number and quality of each of the indicators in sports medicine in this area.

Keywords

Evaluation studies,
Knowledge development,
Knowledge production,
Sport Medicine

Article History

Received 22 June 2022
Revised 24 August 2022
Accepted 25 August 2022
Available Online 29 August 2022

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INTRODUCTION

In recent years, the world has witnessed tremendous advances in sciences and technologies, and sports science is no exception, as it has been considered a broad, advanced, and comprehensive science. Sports medicine is an area of medical practice concerned with the treatment of injuries resulting from athletic activities. Sports medicine bridges the gap between science and practice in the promotion of exercise and health and the scientific assessment, study, and understanding of sports performance (Abou Elmagd, 2020).

Research on sports medicine and its achievements has considerable potential to promote the health of the athlete community. On the other hand, the impacts and achievements of these studies should be evaluated according to the investments in sports medicine studies (Guthrie et al., 2013). The research impact refers to any output of research activities that positively impact the scientific community, the health system, patients, and society as a whole (Milat et al., 2015). It means that it includes changes in awareness, knowledge, understanding, ideas, attitudes, policies, and practices resulting from research. Reducing the loss of investment in research and increasing added value for stakeholders justify the great importance of the research impact as well as its assessment and evaluation (Zachariah et al., 2014).

In this regard, various frameworks and models have been presented for impact assessment of research works. These frameworks provide organizations with an overview of management and supervision of their performance, enable them to understand the contribution of the organization's research in local, national, or international communities, and hold them accountable to the government, stakeholders, taxpayers, and the general public for demonstrating the value of research (Newson et al., 2015; Nason et al., 2008).

The UK's Capital Returns Framework is among the most common frameworks of impact assessment of research in the medical area. This model assesses research impact in five dimensions: (i) knowledge production, (ii) targeting research, capacity, and attraction, (iii) information on policy and product development, (iv) health advantages and health section, and (v) more general economic interests. Some indicators, such as the number of articles and citations, are mentioned in the dimension of knowledge production (Jamali, 2012). Another framework is the Canadian Capital Return model, which is based on the UK's Capital Returns Framework. In the Canadian model, indicators are provided for impact assessment of research on knowledge development. The first set of indicators is called activity indicators, which include the number of published scientific-research articles reviewed based on the subject area, year, number of authors, and the number of joint articles. The second set of indicators is

related to the research quality, which includes the impact factor of the journals, the number of citations, the number of highly cited articles, hot papers, and the number of articles published in top journals. The third set of indicators is related to the development of co-authorship networks. Co-authorship is an example of a scientific collaboration in which two or more authors collaborate to create a joint scientific work. Co-authorship analysis allows national and international collaborations to be identified (Canadian Institute of Health Research, 2005). The impact of publicly-funded medical and health research has been interested significantly over the last few years (Abou Elmagd, 2020). Several studies have been carried out to determine the range of theoretical models and approaches to measure of research impact in various fields such as The impact of Cochrane Reviews (Bunn et al., 2015), in health services or public health research (Newson et al., 2018; Manrique et al. 2019), in environmental, agriculture, and education research (Heyeres et al., 2019), A research impact model for work and health (Van Eerd et al., 2021) and Collective health research assessment: (Kork et al., 2022). Reviewing the background shows that the impact assessment and evaluation of the researches have been done mainly in the field of medical sciences and different models have been used. But so far, sports medicine studies have not been studied from this point of view

It is clear that despite the literature on sports science, the impact assessment of research on sports medicine is from the dimension of knowledge production. Development can pave the way for the realization of national and international plans and policies for prevention and treatment. This can assist the implementation sector in macro-planning based on the results of new research and a better perspective for more accurate insight and better performance of managers and policymakers in this area. Therefore, the main objective of this study is to answer the following question: What is the impact assessment status of scientific outputs in the field of sports medicine based on the combination of indicators of the UK's and Canadian Capital Return frameworks?

METHODS

Data Collection

This is descriptive and applied research which was performed based on the scientometrics approaches, and the data were analyzed using an evaluation technique. The statistical population of this study consists of 1145 articles from sports medicine studies from 2010 to 2019, which are indexed on the science website. For data collection, first, the keywords in the articles on sports medicine were searched in the Web of Science, PubMed, and Scopus databases. The following search strategy was used after the detection of the keywords in the

advanced search section of the Web of Science, which resulted in 8114 results: TS = ("sport * medicine*" OR "sports and exercise medicine" OR "exercise medicine")

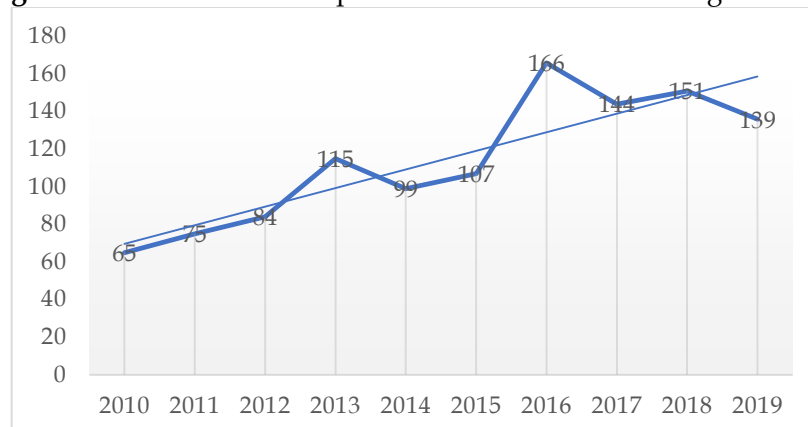
According to the objective of this study, the results were then limited to the type of article and to the period from 2010 to 2019, which resulted in 5009 records. The results were limited to all funding agencies to assess the effectiveness of the allocation of funds in terms of financial resource support, and 1145 records were obtained that were used as the study population.

Three categories of indicators, i.e., activity, quality, and development, were explored in the present study. The information needed to examine these indicators was collected from the Web of Science and the Journal Citation Reports (JCR) database. Finally, the data were calculated and analyzed using Excel and VOSviewer software packages.

RESULTS

In this study, 1145 articles with funding support were studied in the area of sports medicine from the Web of Science from 2010 to 2019. The results revealed that more than 99% of the articles were published in English, and the publication of articles had an ascending trend (Figure 1).

Figure 1. Growth Trend of Sports Medicine Articles During 2010-2019



In the study of quality indicators, it was found that the total number of 1145 retrieved documents have been published in 333 journals, of which 310 titles (93.09%) of these journals have an impact factor in the Journal Citation Reports (JCR) and 23 journals (6.9%) had no impact factor. About a third of the journals were in the first quarter. The results also showed that the articles received 38,710 citations, of which 1,093 articles (95.45%) had citations and only 52 articles (4.54%) did not receive any citations. the citation-to-article ratio is 35.41 (Table 1).

Table 1. Status of Sports Medicine Articles in Terms of Activity and Quality

Indicators	Number	%
Total citations	38701	100
Cited papers	1093	95/45
Papers without citation	52	4.54
Citation ratio to cited papers	35.41	–
Citation ratio to all papers	33.80	–
Journals with impact factor	310	93.09
Journals without impact factor	23	6.90
Total number of journals publishing papers	333	100
Number of articles published in Q1 journals	709	61.92
Number of Q1 journals publishing papers	97	31.29
Number of hot papers	1	0.08
Number of highly cited papers	5	0.43

According to the topical review of articles, it was found that all articles under study have been published in 104 different topic groups. Among them, 41.22% of the articles (472) were published in the sports science group, followed by the orthopedic group with 146 articles (12.75%) and physiology with 70 articles (6.11%). The 20 topic groups in which most sports medicine articles have been published are presented in Table 2. The results indicated that the highest rate of citations among different topic groups was related to the “Public, Environmental & Occupational Health” with a ratio of 36.70 followed by “Geriatric Medicine” (35.06) and “Clinical Neurology” (34.05). On the other hand, the lowest citation rate among the 20 groups was related to the topic group of sports sciences, with a ratio of 12.10 citations per article.

Table 2. Top 20 Topics in Terms of Article Publication Frequency, Number of Citations, and Citation-to-Article Ratio

Topics	Papers	%	Citation	Citation-to-article ratio
Sport Sciences	472	41.22	5712	12/10
Orthopedics	146	12.75	1947	13/33
Physiology	70	6.11	1082	15/45
Rehabilitation	61	5.32	1398	22/91
Public, Environmental & Occupational Health	48	4.19	1762	36/70
Surgery	47	4.1	725	15/42
Medicine, General & Internal	38	3.31	873	22/97
Multidisciplinary Sciences	26	2.27	643	24/73
Rheumatology	25	2.18	361	14/44
Neurosciences	23	2	851	37
Nutrition & Dietetics	22	1.92	587	26/68
Engineering, Biomedical	21	1.83	420	20

Table 2. Continues

Topics	Papers	%	Citation	Citation-to-article ratio
Clinical Neurology	18	1.57	613	34/05
Medicine, Research & Experimental	18	1.57	290	16/11
Geriatrics & Gerontology	16	1.39	561	35/06
Pediatrics	16	1.39	456	28/5
Oncology	15	1.31	374	24/93
Endocrinology & Metabolism	14	1.22	361	25/78
Pharmacology & Pharmacy	12	1.04	170	14/16

The study of impact factor and average impact factor of topic group journals demonstrated that among the top 20 journals, most journals had a higher impact factor than the average impact factor of topic group journals, and one journal, i.e., BRITISH JOURNAL OF SPORTS MEDICINE, had the highest impact factor compared to other journals in the topic group. The top 20 journals have published 681 articles on sports medicine (Table 3).

Table 3. The Top 20 Source Title of Sports Medicine Papers

Journals	Country	Papers	(IF)	(MIF)	(Q)	Citation
Journal of Science and Medicine in Sport	Australia	401	3/607	1/979	Q1	7642
British Journal of Sports Medicine	England	42	12/68	1/979	Q1	23370
American Journal of Sports Medicine	USA	32	5/81	1/979	Q1	34313
Orthopaedic Journal of Sports Medicine	USA	25	2/492	1/979	Q2	2959
Arthroscopy-The Journal of Arthroscopic and Related Surgery	USA	25	4/325	1/979	Q1	16791
Medicine and Science in Sports and Exercise	USA	21	4/029	1/979	Q1	37601
Plos One	USA	21	2/74	1/866	Q2	688786
International Journal of Sports Medicine	Germany	14	2/556	1/979	Q2	8353
Clinical Journal of Sport Medicine	USA	11	3/165	1/979	Q1	4242
BMC Public Health	England	10	2/521	2/104	Q2	40148
BMJ Open	England	9	2/496	1/681	Q2	35626
Sports Medicine	New Zealand	9	8/551	1/979	Q1	18114
Frontiers in Physiology	Swiss	9	3/367	2/456	Q1	21190
International Journal of Behavioral Nutrition and Physical Activity	England	8	6/714	2/937	Q1	11154
Journal of Sports Sciences	England	8	2/597	1/979	Q2	13266
Journal of Strength and Conditioning Research	USA	8	2/973	1/979	Q1	18708
Journal of Physical Activity & Health	USA	8	1/993	2/104	Q2	4924
Pm&R	USA	7	1/821	1/979	Q2	3411
Applied Physiology Nutrition and Metabolism	USA	7	2/522	1/692	Q3	5955
Sports Health-A Multidisciplinary Approach	USA	6	2/866	1/979	Q1	2224

The majority of the articles were co-authored, 17.03% of which were published in collaboration with five authors. A total of 5336 authors contributed to producing 1145 sports medicine articles in the last decade, and on average, each article has been written by three authors. The highest number of co-authors in an article was related to an article with 38 authors. Only 28 articles were written by single authors without scientific participation.

The assessment of international scientific participation in sports medicine indicated that 1145 articles were written by authors from 49 countries, all of which had participated in at least one document. The highest scientific collaboration was with 432 articles by the USA (Figure 2). In this study, in addition to countries, the degree of collaboration of organizations and universities in writing articles has been investigated. The collaboration map of organizations with at least five documents in sports medicine is illustrated in Figure 3.

According to the results of this section, a total of 1400 organizations have had international scientific collaborations in producing sports medicine articles. Among these organizations, the University of Queensland, Deakin University, and Monash University had the most scientific participation with 59, 49, and 39 articles, respectively.

Figure 2. Network Map of Scientific Collaboration Between Countries in Publishing Articles on Sports Medicine

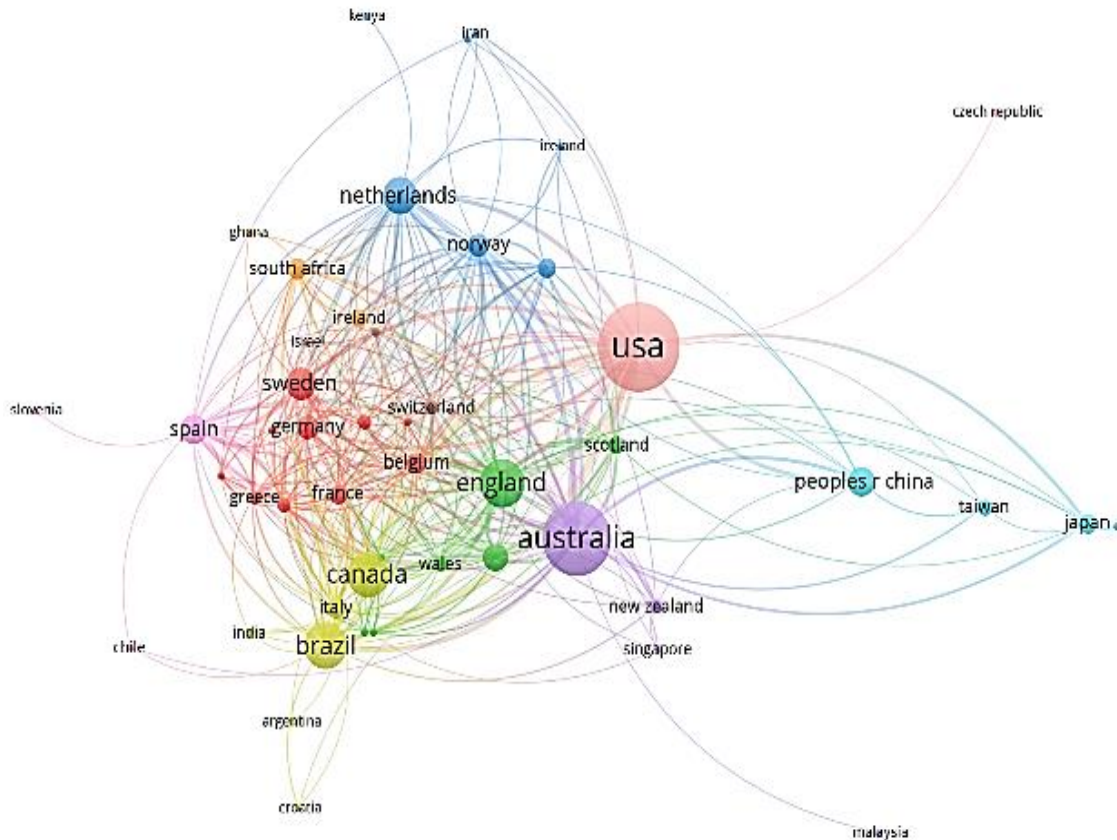
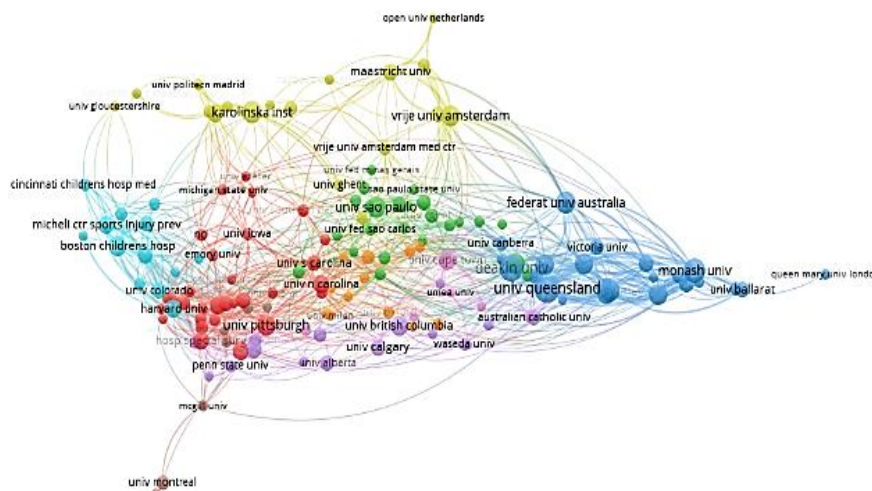


Figure 3. Network Map of International Scientific Collaboration of Organizations Publishing Sports Medicine Articles



DISCUSSION

The present study assessed those sports medicine articles that were funded and indexed on the Web of Science database during 2010-2019. In general, 1145 articles on sports medicine were covered by this database in the 10-year period, which were funded by 1557 organizations. Although research funding in this area has fluctuated over the past decade, an ascending trend has generally been shown. In this regard, it is noteworthy that the tendency to invest in and conduct scientific and medical studies across the world is generally increasing, which can be attributed to the growing tendency of scholars to research in the area of global health (World Health Organization, 2013).

In this study, the indicators of the UK's Capital Return framework and the Canadian Capital Return framework were used for the impact assessment of research on sports medicine from the knowledge production and development dimensions. Multiple studies have employed these two frameworks for impact assessment of research at the national and organizational levels (Hiney & Curran, 2015; Cohen et al., 2015; Donovan et al., 2014; Feyzabadi & Vaziri, 2019).

Studies for impact assessment of research on knowledge production and development have applied various indicators. Some studies have used only the indicators of the number of articles and the number of citations as the criteria for the research impact on knowledge production using the UK Capital Return model (Cohen et al., 2015; Feyzabadi & Vaziri 2019; Wooding et al., 2014; Nason et al., 2008).

Citation is an indicator used to indicate the scientific impact of an article or journal. Therefore, the scholars generally aim to publish articles that, by receiving more citations, affect significantly science (Falagas et al., 2013). Decision-makers commonly use the number of citations to evaluate the scientific performance of scholars, groups, and research organizations (Leimu & Koricheva 2005). According to the results of this study, these articles received a total of 38,710 citations, of which a total of 1093 articles (95.45%) received citations, and only 52 articles (2.54%) did not receive any citations.

Furthermore, for the articles which received citations, the citation-to-article ratio is 35.41, but for all articles this number is equal to 33.8. In addition to the number of articles and the number of citations, several studies have employed the citation-to-article ratio indicator for impact assessment of research on knowledge production and development (Agarwal et al., 2016; Feyzabadi & Vaziri, 2019). The results revealed that the citation-to-article ratio in these articles was 23.17, which is higher than the clinical medicine area, based on data from the ESI (Essential Science Indicators) database, which was reported to be 6.8 in 2012. Moreover, in a study on clinical and medical research impact in Catalonia, the results indicated that the average citation per article was equal to 9.24 (Adam et al., 2012).

Journal Impact Factor (JIF) is an indicator that points out the quality and impact of journals and is extensively used in research evaluations (Agarwal et al., 2016). In various studies, the JIF has been employed as an indicator for impact assessment along with other indicators (Agarwal et al., 2016; Gordon & Bartley, 2015). According to the results, the average impact factor was 3.9 for the journals in which the articles were published. In a study, the average impact factor for Australian health research and clinical research in anesthesia departments was 3 and 2.1, respectively (Reed et al., 2011; Swaminathan et al., 2007). The analysis of journals publishing sports medicine articles showed that most journals belong to the first and second quarters, i.e., the majority of articles are indexed in journals with a higher impact factor. Journals, as one of the information containers, are of special importance because they publish the latest scientific materials in specific areas at short and regular intervals. Publishing and indexing an article in a reputable scientific journal can indicate its high quality.

Scientific collaboration rate and co-authorship are other indicators that have been employed in researches on health to show the impact of their research (Agarwal et al., 2016; Gordon & Bartley, 2015; Sainty, 2013). Scientific collaborations enable sharing of knowledge, skills, and techniques among scholars. Such a flow of knowledge contributes to the process of "knowledge accumulation," resulting in economic development (Scarazzati & Wang, 2019). The evaluation of the authors participating in the present study indicated that on average three

authors collaborated in writing each article. The majority of articles have been published by five authors, and a small number of articles have been published by a single author. In other words, co-authorship was found in most articles.

The results of the analysis of sports medicine articles from the aspect of collaboration at the level of organizations and countries demonstrated that 37.72% of the studies were conducted in collaboration with international organizations. The relationship between scientific collaboration and citation is mentioned in various studies, the results of which showed that studies published in collaboration with various national and international researchers have a more significant impact and receive more citations compared to other studies (Kwiek, 2021; Didegah & Thelwall, 2013).

CONCLUSION

The results of the present study, based on a selected model and a combination of indicators of the UK and Canadian Capital Return frameworks (from the production and development dimension), generally highlighted the validity and effectiveness of all indicators, including activity, quality, and development. The results revealed that the number and quality of all indicators had a significant impact on the field of sports medicine. For instance, the top topic groups have the highest number of articles and citations, and the countries, organizations, and authors in these subject areas have the most collaborations. The results represent the appropriate and thoughtful investment in publishing articles in this area. In other words, funding and budgeting agencies act in the right way to achieve the desired results and observe a positive impact. In addition, the study results indicate the high expertise and credibility of sports medicine activists. These individuals, organizations, countries, and journals have considered both the quantity of their studies, as well as the credibility and quality of their professional activities. So, regarding the developments observed during the years under review, it can be argued that they will continue to witness desirable quantitative and qualitative improvements.

Although this study just examined the main indicators of activity, quality, and development, it did not consider other indicators related to the impact assessment of research on knowledge development. Results, however, can generally be used as basic data for managers of universities, organizations, institutions, and research investors. Firstly, it helps them to know the status of sports medicine studies. Secondly, the results give them the opportunity to learn about their impact, on planning for funding as well as focusing on national and international collaborations. Given the ascending trend of sports medicine

studies, the growth of articles in this area is predicted to be more significant in the coming years. Therefore, the need for their impact assessment on knowledge production and development should be considered vital by medical research policymakers for their more appropriate orientation.

Authors' Contributions

The authors made a substantial contribution to the design of the study, acquisition, analysis, writing, and final approval of the manuscript.

Acknowledgments

This study was sponsored by Yazd University, Iran.

Declaration of Conflict Interest

The author declares that there is no conflict of interest.

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Investigating the Role of Physical and Digital Environment on Creating Active School with Respect to the Mediating Role of Social Environment

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ABSTRACT

Keywords
Active School,
Digital school
environment,
Physical environment,
Social environment

Article History
Received 22 January 2022
Revised 07 May 2022
Accepted 24 May 2022
Available Online 08 July 2022

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Reform Document of Education (FRDE), creating active schools by relying on environmental potentialities is the goal with utmost significance; therefore, the present study aimed to explore the role that physical and digital environments play in achieving this objective. To this end, a descriptive-correlational design was utilized to probe the perception of teachers and physical education experts (n=302) sampled from a population including 892 personnel of the Education Department of Guilan. Data were obtained using a 5-point Likert scale, and 30 experts judged the face and content validity. The reliability and construct validity of the scale was checked and confirmed by Cronbach's alpha ($\alpha=.87$) and exploratory-confirmatory factor analysis. Using SPSS 22 and PLS3 for data analysis, researchers found that physical, social, and digital factors effectively created an active school environment .31, .23, and .29 percent of the variances. Moreover, Social context as the mediating variable was correlated with physical and digital environment .30 and .34, respectively. Relying on the findings of this research trend, policymakers and managers can enrich the physical and digital environments of the schools and move towards accomplishing principle 6.6 of FRDE, which highlights the role of the social environment in an effective educational system.

INTRODUCTION

An active, capable, growing, and vibrant population is essential to maintaining national authority, part of which is achieved through participation in physical activity and sports. Still, today, with the increasing use of technology in family and work life, public welfare, the spread of urbanization, the outbreak of Covid 19, and home quarantine, a sedentary lifestyle has become prevalent in society. One of the appropriate social institutions for realizing a healthy and active society is the school. Schools are the most important social element influencing the formation of beliefs, personalities, and lifestyles, which deals with the most sensitive age group of any society and is the product of human culture's efforts to survive education (Mosadeghrad et al., 2020).

Educating youngsters and adolescents is the crucial responsibility of a good governorship that must be accomplished based on reliable theoretical, cultural, political, and practical plans. In recent years (2014-2021), Iran's Physical and Health Education Organization (PHEO) planned its policies by considering FRDE. Consequently, the health and the physical capabilities of students have become an important issue, the significance of which is traceable within the slogans, perspectives, and upcoming goals of the organization and educational system, where improving personal health and responsiveness to physical and mental needs of the students through sports and safe personal and social recreations have been emphasized and clarified (Ministry of Education, 2010).

One of the planned and followed projects in recent years (2014-2021) was the Active School Yard Project which attempted to increase the self-initiated activities of youngsters and adolescents, improve their physical literacy, and form efficient and healthy habits and lifestyles. Conforming the project to the student's interests and motivation received significant attention from all over the country, and trust for applying this project was guaranteed to not only move on in the future but also develop into the project Active School (Hajizadeh et al., 2020). Active School is the integration of three principles; namely, increasing the quality of physical education at schools and supplementary activities, creating opportunities for physical activities, and consolidating an active lifestyle throughout one's life by utilizing all the available spaces of school (i.e., classroom, corridors, yard, etc.) and the participation of factors within and without school environment (parents, school personnel, candidates, organizations, etc.) for helping the students prior, while, and after their presence at school (Hajizadeh et al., 2020). To this end, the Active School project was planned to increase the students' self-initiated activities and improve their physical literacy so that a safe and active lifestyle is introduced to

the students. The main goal of this project is to nurture active and lively students that participate in physical and educational activities and are armed with proper physical literacy and an active lifestyle and mindset (Hajizadeh et al., 2020). Attempting to apply the Active School project, schools use all possible resources and available environments to consolidate a healthy and active lifestyle for students so that, in the long run, a healthy and active society emerges (Ministry of Education, 2018).

The physical and social aspect of the Active School Project comes from Smith et al.'s (2020) Creating Active Schools (CAS) Framework and the content of the Active School Document (Hajizadeh et al., 2020). Additionally, the digital aspect of the project was adapted and adopted from Karhu et al. (2018). Finally, the conceptual model of the research introduced three underlying factors; namely, (1) physical environment, (2) digital environment, and (3) social environment. The available literature signals a fair number of studies regarding each model aspect. For instance, regarding the physical environment of the school and its effectiveness on the school activity and dynamism, Brittin et al. (2015) published the first series of guidelines, including ten principles to consider in the architecture of an active school in a way that fits the physical activities of the students. Fazelian and Azimi (2014) noted that considering the standards of the physical environment in designing the educational contexts and schools increases the participation of the students and teachers in sports and physical activities, and in contrast, ignoring such standards for designing schools decreases the liveliness and physical participation of teachers and students. According to Weng and Chiang (2014) and Hug et al. (2009), exercising in an open environment has more positive effects than practicing in a closed and limited-space environment such as a house.

According to Gibson's (1978) price theory, the school space and environment is a complex in which students' goals are fulfilled and supported. The supportive perspective of this theory sees the costs and investments as influential factors in individuals' development; therefore, the price theory has been used as a powerful framework by which psychologists and environmental designers analyze and justify the interplay between the environments and behaviors (Smith et al., 2016). Furthermore, the openness of contexts such as schools paves the way for emotional and psychological connections between individuals.

As far as the social aspect of schools and their role in activating the schools are concerned, Mousavi et al. (2020) asserted that sport is a social phenomenon and reflects the values, norms, and cultural characteristics of any society. Since the environment affects how people participate in actions, the social context can guarantee the participation of individuals in physical activities. Social support from family, friends, and others is effective in the

participation of individuals in physical activities. It is regarded as a factor that prevents inactivity and sedentary and encourages physical activity (Hashemi Motlagh et al., 2018). According to Keroack (2015), parents encouraging their children towards exercise and in-house physical homework can play a significant role in their youngsters' kinesthetic activities. Teachers can also play the role of counselors and game-changers. They can lead the students toward the available resources and facilities by increasing students' motivation (Fitria & Suminah, 2020).

The social environment is the integration of mesosystem-exosystem layers of Bronfenbrenner's (1999) ecological systems model. The quality of a passive environment does not provide the basis for effective responses of the individuals unless the social environment changes the situation through attention, exploration, and manipulation.

Sullivan (2019) reported on the role of digital space and environment on the activation of schools and indicated that lots of students' activities such as Active Travel to school and doing physical exercises had been hampered due to limitations in digital classrooms which again is narrowed down to the use of pictures, clips, and multimedia. Although the integration of innovations and technologies with education is new, many teachers are unfamiliar with how the technology can be used, and there is no argument on its role as the main or supplementary education channel (Casey et al., 2017). According to Franklin and Smith (2015), practical and effective solutions must be presented and utilized to increase the possibilities of achieving physical training goals. In this regard, educational technologies and innovations can provide the students to accomplish their goals through online lessons and practice. On the one hand, the nature of physical education in the school context is based upon activation and movement, and combining it with technology signals inactivity and limited physical involvement has received considerable criticism. Arguments in this regard are diverse; many see physical exercise as an antidote to the inactivity caused by technology and smartphones (Prohl & Wiemeyer, 2016).

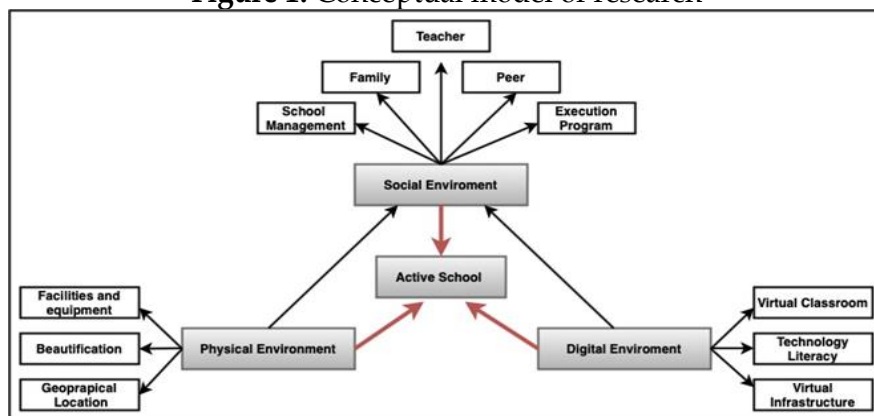
According to Russell and Wards's (1996) theory of environmental psychology, there is always a connection and link between the environment and the individuals' activation factors. Further, as noted by Ebrahimzadeh (2015), physical and social factors are significantly intertwined with the kinesthetic and psychological factors of the individuals. Additionally, as Hamburger and Artzi (2005) indicate, the digital environment and the internet can affect each student differently, and these effects differ based on the people's characteristics and properties of the environments. Therefore, the social environment can pave the way for utilizing these potentialities effectively.

On the one hand, the interaction between physical, digital, and social environments and social context can effectively balance this equation (Gubbels et al., 2011). Furthermore, the potential role of social context and environment (i.e., teachers, parents, authorities, etc.) has been emphasized within FRDE and is introduced as a leading factor in education. Stokols' (1992) model also presents the social environment as the factor that increases individuals' interaction with the surrounding contexts. As previously noted, according to Bronfenbrenner (1999), the quality of a passive environment does not provide the basis for effective responses of the individuals unless the social environment changes the situation through attention, exploration, and manipulation.

Bronfenbrenner (1999)'s bioecological model emphasizes the relationship of adolescents and youngsters with the environment. In this model, the environment in which everyone lives is divided into four layers which tap into different layers of individual, social, educational, and cultural life. According to Bronfenbrenner (1999), the quality of the environment itself is not a sufficient trigger for the individuals to respond accordingly unless other factors such as attention, exploration, manipulation, imagination, and interpretation are at work. In other words, the social environment provides the soul to the isolated and passive environments. In this vein, the present study attempts to unravel the effective factors of physical, social, and digital environments and interpret their outcomes in the so-called active school environment.

In this regard, the present study aims to determine the effective factors in the schools' physical, social, and digital environments. Since social context has been treated as an influential factor in the literature, the present study sees it as a mediating variable (Figure 1). This gives rise to the second question asking how physical and digital environments, directly and indirectly, influence schools' activation concerning the mediating role of the social context?

Figure 1. Conceptual model of research



METHODS

Study Group

The study population included physical education teachers and authorities of the Education Department of Guilan (n=892) in the academic year (2021-2022). The population consisted of 408 male and 445 female teachers and 39 physical education experts in the department. For modeling and answering the questions of the study, 302 individuals were sampled through the random-clustering method (female= %52, male=%48) and categorized in the sample based on their dispersion in different regions of Guilan. For modeling and answering the questions of the study, 302 individuals were sampled through the random-clustering method categorized in the sample based on their dispersion in different regions of Guilan. The descriptive statistics of the study describe the participants according to gender (female= %51, male=%49) with ages ranging from 31 to 40 with a frequency level of 41.4. The calculations show that %44 of the participants had experience below ten years. Furthermore, %56 of them had a Master's degree or above.

Data Collection Tools

A scale including 18 items was designed to assess the participants' perceptions. The scale items were from the content analysis and based on the available literature concerning the factors involved in active schools. Additionally, 18 English articles and 10 Persian resources were studied thoroughly. Twelve experts in the physical management field, 13 experienced teachers of physical education, and five authorities in the area judged the face and content validity of the scale. The scale's reliability was checked using Cronbach's alpha method showing a reliability estimate of 0.87. The scale was constructed and validated by exploratory factor analysis based on Hair et al.'s (1995) suggestion. Finally, a 5-point Likert scale including 50 items that tap into 12 facets was at hand. Ten items in the questionnaire shed light on the physical aspect of the model, which encompasses three factors; namely, (1) geographical location, (2) beautification, and (3) facilities and equipment. Fifteen items tapped into layers of the digital environment which include (1) virtual classroom, (2) technology literacy, and (3) virtual infrastructure. The remaining 25 items were dedicated to different aspects of the social environment, which include (1) school management, (2) family, (3) teachers, (4) peers, and (5) execution program. Data were analyzed using SPSS22 and Smart PLS3 for Structural Equation Modeling using Partial Least Squares (PLS) approach. The status of convergent reliability and validity coefficients are depicted in Tables 1 and 2.

Table 1. Convergent Reliability and Validity Coefficients of Research Variables

AVE		Cronbach's alpha		Composite reliability		Dimensions	Factors
0.805		0.762		0.892		Geographical location	Physical environment
0.745	0.563	0.829	0.913	0.898	0.927	Beautification	
0.680		0.882		0.914		Facilities and equipment	
0.697		0.855		0.902		Virtual infrastructure	Digital environment
0.734	0.538	0.879	0.938	0.917	0.946	Technology literacy	
0.658		0.913		0.931		Virtual teaching method	
0.775		0.927		0.945		Family	Social environment
0.751		0.917		0.938		Teachers	
0.765	0.50	0.846	0.941	0.907	0.947	School management	
0.867		0.846		0.929		Peers	
0.786		0.863		0.917		Execution program	
0.586		0.882		0.908		Active school	

Table 2. Comparison Matrix of Extracted Mean Variance of Correlation Coefficients of Structures (Divergent Validity)

Fornell and Larcker	Execution Program	Virtual Infrastructure	Technology Literacy	Virtual Teaching	Peers	Teachers	School Management	Geographical Location	Beautification	Facilities And Equipment	Active School	Family
Execution Program	0.886											
Virtual Infrastructure	0.373	0.835										
Technology Literacy	0.375	0.638	0.857									
Virtual Teaching Method	0.451	0.645	0.693	0.811								
Peers	0.507	0.356	0.384	0.402	0.936							
Teachers	0.537	0.398	0.522	0.437	0.444	0.866						
School Management	0.579	0.479	0.536	0.514	0.438	0.606	0.875					
Geographical Location	0.300	0.302	0.305	0.276	0.256	0.386	0.360	0.898				
Beautification	0.343	0.444	0.454	0.405	0.311	0.556	0.496	0.593	0.863			
Facilities and Equipment	0.371	0.460	0.454	0.383	0.287	0.546	0.498	0.574	0.717	0.824		
Active School	0.511	0.564	0.610	0.573	0.494	0.623	0.566	0.491	0.585	0.666	0.766	
Family	0.540	0.471	0.532	0.500	0.491	0.579	0.552	0.459	0.537	0.592	0.630	0.880

Based on the results and output of the programs, as shown in Tables 1 and 2, the scale demonstrated acceptable reliability and validity. Table 2 shows the degree of correlations between the constructs involved in the study. For instance, in the first column dedicated to the execution program, the construct correlates 0.89 with other related items. The same is true about other aspects as well; therefore, the divergent validity of the scale is also confirmed.

Data Analysis

Data were analyzed using SPSS22 and Smart PLS3 for Structural Equation Modeling using Partial Least Squares (PLS) approach. After ensuring the face and content validity of the items by experts, an Exploratory and Confirmatory Factor Analysis was run to investigate the construct validity of the items using the answers of 100 individuals shown $KMO=0.79$, Kervit Bartlett's $\chi^2=4087.373$ were statistically significant at $p < 0.001$, which indicates model fit indices of the data. According to Sarmad et al. (2015), 5 to 10 individuals are sufficient for running exploratory factor analysis; however, others argue differently on the exact number. For Sapnas and Zeller (2000), 50 is the least required number for the calculations, yet the number is reported to be above 300 for some other scholars (See e.g., Hajizade & Asghari, 2011). Since no robust number was at hand, the researchers selected 100 individuals for the exploratory phase of the analysis. Additionally, since we wanted to ensure that our data properly taps into all 12 dimensions of the structural model, we followed the suggestions provided by Davari and Rezazadeh (2017) and used 302 individuals as the adequate number of individuals for Confirmatory Factor Analysis.

Using the Varimax method in the Factor Analysis set for measures higher than 1, 12 facets were at hand including the %70 of the total variance. The status of convergent reliability and validity coefficients are depicted.

RESULTS

Significant estimates along with the results of factor analysis were used for confirming the underlying hypotheses of the study where the amount of t.value exceeds 1.96, the statistically significance of the relations would be confirmed at a confidence level set to 0.95. According to Figure 2., all items enjoy a t.value > 1.96 which indicates the significant relationship in-between all the constructs involved in the study at the confidence level of 0.95. Table 3. Indicates that physical, social, and digital environments are 0.31, 0.32, and 0.29 effective respectively in the activation of schools and transforming them into Active Schools. Next, the direct and indirect effects of factors involved in school activation were probed by analyzing the variances. The results indicate that physical and digital environments are 0.31 and 0.34 effective in the liveliness and activation of schools.

Factor loads are calculated by calculating the correlation value of the characteristics of a structure with that structure and its appropriate value is equal to or greater than 0.4 (Hewland, 1999). According to Figure 3, within the social dimension, all 5 factors; namely, (1)

family, (2) teachers, (3) school management, (4) peers, and (5) executive programs were significantly effective in enriching the social contexts. Family is effective 0.846 of the time along with teachers (0.844), school management (0.789), executive programs (0.768), and peers (0.655). As far as the digital dimension is concerned, digital literacy (0.893), virtual classroom (0.880), and virtual infrastructure (0.848) were shown to be effective. For the physical environment, facilities and equipment, beautification, and geographical location scored 0.936, 0.884, and 0.752 respectively.

Table 3. Results of Fitting the Structural Model of the Research

Test result	Effect size criterion ^a	Significance coefficients (1.96) ^b	Path coefficient	Sub and main-hypotheses
Accept	0.102	6.172	0.310	Active school ← physical environment
Accept	0.090	5.955	0.329	Active school ← Social environment
Accept	0.050	6.398	0.288	Active school ← Digital environment
Test result	VAF ^c	Sobel test ^d	Mediator Hypothesis	
Accept	0.30	4.676	← Social environment ← physical environment Active school	
Accept	0.34	5.062	← Social environment ← Digital environment Active school	

a: Cohen's d, b: t-value, c=variance accounted for d=the outcome of interest

Furthermore, Standardized Root Mean Residual estimate (SRMR) equal to 0.05 and less than 0.08 is acceptable. A normal Fit Index equal to 0.93 and higher than 0.90 is also acceptable as shown in Table 4.

Table 4. Results of Overall Model Fit

AVE ^a	R ²	Dimensions	AVE ^a	R ²	Factors
0.805	0.563	geographical location	0.563	Second order variable	physical environment
0.745	0.717	Beautification			
0.680	0.876	Facilities and equipment			
0.697	0.876	Virtual infrastructure	0.538	Second order variable	Digital environment
0.734	0.797	Technology literacy			
0.658	0.773	Virtual teaching method		Second order variable	Social environment
0.775	0.714	Family	0.500		
0.751	0.711	teachers			
0.765	0.622	school management			
0.867	0.427	peers			
0.786	0.588	execution program			
0.586	0.646	Active school			
SRMR ^b = 0.05 ≤ 0.08				Good model fit	
NFI ^c = 0.93 ≥ 0.90					

a= average variance extracted, b=Standardized Root Mean Square Residual, c=Normed Fit Index

Figure 2. Significant Coefficients of the Main Research Hypotheses

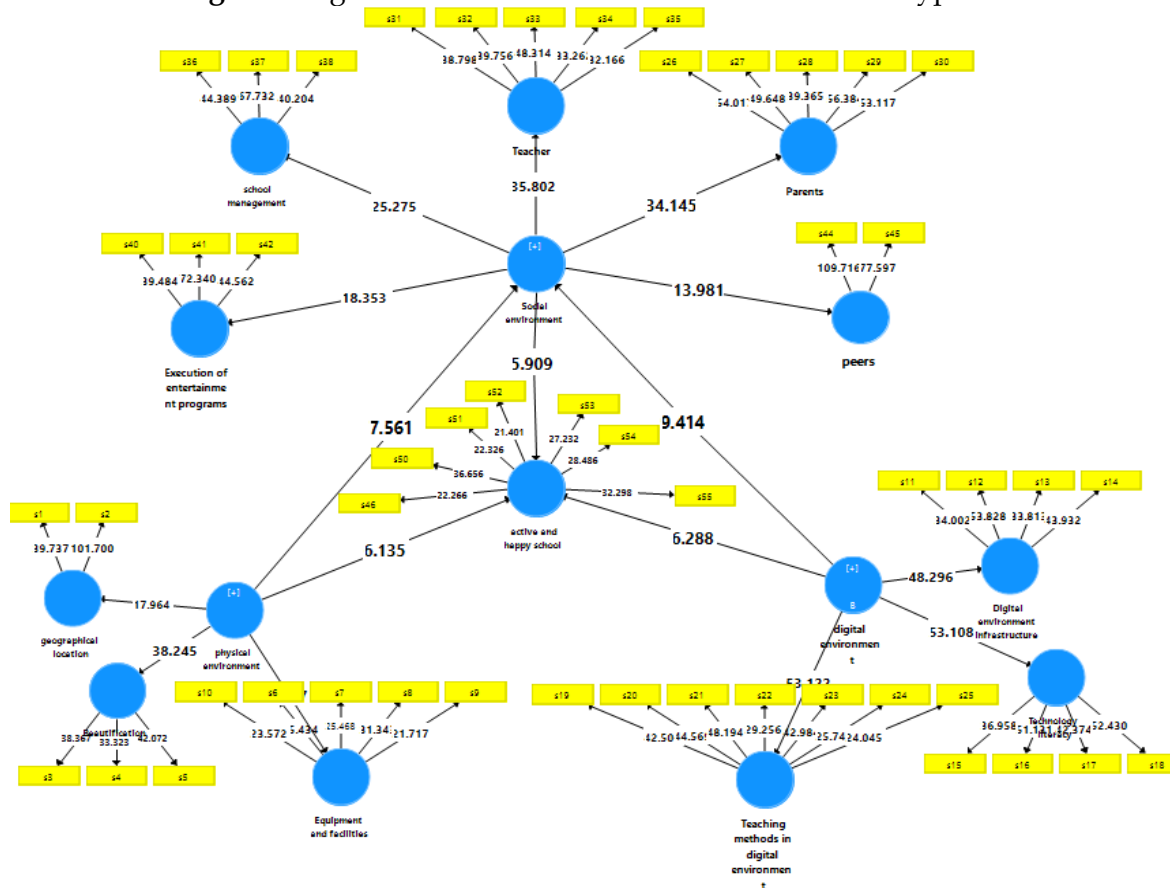
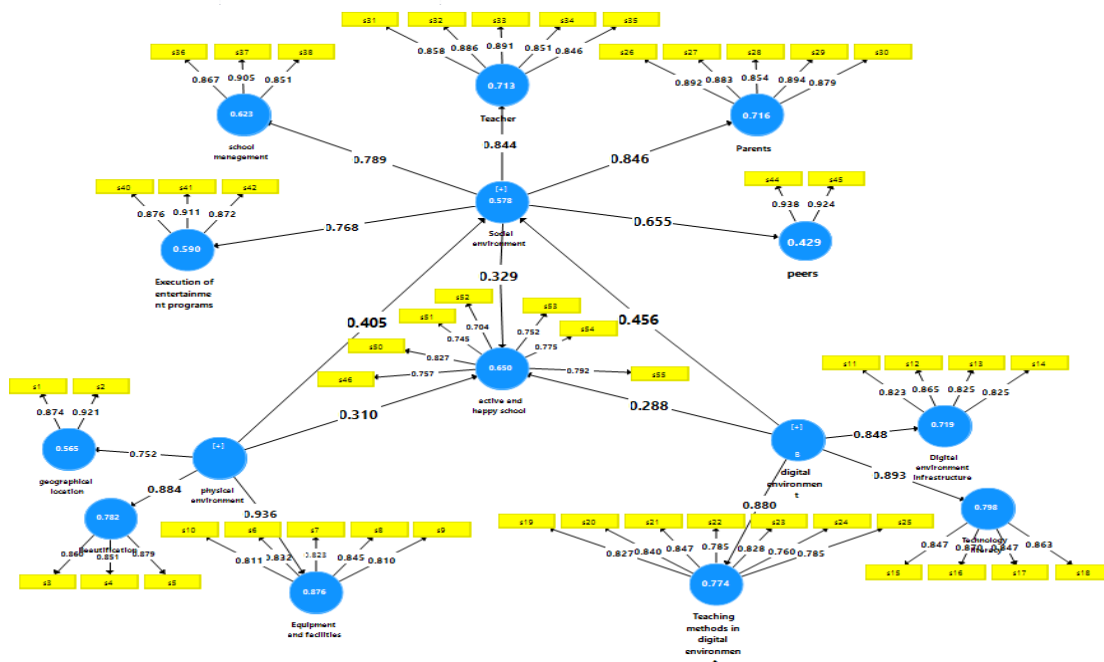


Figure 3. Standard Coefficients of the Research Model



DISCUSSION

This study aimed to investigate the role of physical and digital environments on creating an active school situation concerning the mediating role of the social environment.

The analyses revealed that the social environment is the most salient factor and has the maximum effects. Further, the physical and digital environments were identified as the most influential factors. Looking at the literature and the theoretical interpretations, one can realize the significance of social environment on the activation of school situations which is in line with studies conducted by other scholars. (e.g., Bay & Esfahani Nia, 2019; Mohammadi, 2019; Hejazi et al., 2015; Mehdizadeh et al., 2014; Prince et al., 2012; Cradock et al., 2009; Davison, 2009; Chelbi et al., 2009). The replete number of studies in this regard signals the fact that the social environment of the Iranian context has the pre-requisites for creating active schools. Therefore, the sociality of school environments can be an effective factor in school activation and the enhancement of the educational activities and pave the way for improving the physical health and education of students and teachers. According to some scholars (e.g., Huppke, 2001), human beings are social, and the more social life they experience, the more happiness comes into their way.

In the present study, the social environment was divided into five aspects; namely, (1) family, (2) teachers, (3) school administrators, (4) school programs, and (5) classmates. What emerged from the data analyses was that teachers and family play the most significant roles in socializing the life of the students and factors (5), (3), and (4) come respectively after them. Fitria and Suminah (2020) and Safari et al., (2018) have also emphasized this issue and mentioned that teachers are the game-changing factors and motivators in this domino. According to the scholars, the appearance and ethics of teachers enhance the students' willingness to participation and involvement in physical activities. It is noteworthy that during COVID Pandemic, the role of teachers and families are somehow equated, which means that families play many similar roles to those of the teachers. The studies conducted by Asefi and Ghanbarpour (2018), McDavid et al. (2012), and other existing literature suggest that the involvement of families in sports and physical activities is essential for students' personal and social growth.

On the other hand, the school administration's commitment and support facilitate the activation of all school environment elements. Furthermore, the application of national curricular programs such as the Kooch Program, The Champion School, and other related scholastic plans have helped the schools' administration to tread even further towards the collective physical and mental health of the educational system and active schools. These findings bold the crucial roles of teachers within society since the facilitative interaction and collaboration of teachers with their students can positively affect the students' well-being and happiness. The same can be argued about the role of school and families. Since moving

towards educational goals such as active schools and societies is complicated, the simultaneous collaboration of all elements and environments seems essential. Care must be considered when discussing the relation between physical and digital environments. As we previously put, neglecting the potentialities of society and social life would hamper the effectiveness of other dimensions, and the personal and social growth that is addressed throughout the present study and the existing literature would not emerge. This again is in line with Bronfenbrenner (1999)'s bioecological model, where the role of social setting is emphasized and is treated as one of the key elements in maximizing the participation of students in physical activities and group work. This again is in line with principles 4-2, 4-3, and 8-7 of Iran's FRDE where in points 4 and 8 of this document one can fully reflect on the role of teachers and families in fulfilling the long-term goals of the educational system; therefore, the Ministry of Education can properly utilize the properties of the social settings to maximize the participation of teachers, students, authorities, neighborhoods, people, and the whole society and help them to expand the horizons of active schools into other aspects of the students' lives.

As far as the physical dimension is concerned, the study showed that it is the second most important factor in creating active schools. This factor has been among the most effective elements within all educational systems throughout history. Most of the models in active school literature have identified it as one of the critical elements. In the Iranian context, the significance of the physical environment has been emphasized in different educational documents. For instance, before the FRDE document, within the 6-Dimensional Document of Education and in principle number 14.3, one can find the importance of such contexts for the educational goals of any school and system. The argumentation about the significance of the physical environment is not only limited to sports management domains other fields and disciplines related to management and organizations have listed this factor among the important factors which influence the interactions and the outcomes of all social environments. Also, the studies of Hyndman and Wyver (2020), Chu et al. (2020), and Laboy (2019) reminds us about the role that this factor plays in the activation of schools; therefore, another implication of the present findings would be that more care must be taken into considerations when preparing and designing the physical environments of the schools.

The physical dimension in our study was divided into three facets, namely, (1) facilities and equipment, (2) beautification, and (3) geographical location, where all of the most significant factors is the facilities, and the least one is the geographical location. This implies that facilities and types of equipment within the school environment play a major role in the

enthusiasm and motivation of the students and the activation of schools. The findings of our study are in line with Chu et al. (2020) and Hyndman and Wyver (2020), who listed this dimension as one of the key aspects that authorities must beware of when deciding on creating active schools. Additionally, the importance of school beautification cannot be neglected. Cleanness, proper lighting, and colorful walls and spaces are some points that can be considered. Regarding the status of geographical location as the least important one within the physical dimension, we can discuss that this variable cannot be treated as a fixed and never-changing element. It depends on the weather and seasonal situations within every region and province. In one season, it may be the most important factor and in the other, it might not be that effective. According to psychologists, the physical situation affects the students' sense of belonging and helps them to make stronger mental connections to the school and other social environments. Therefore, another implication of the present study would be the advice to the authorities and policymakers for considering the proper design and structure of schools since it is, as we saw, one of the main aspects of active schools.

After the COVID-19 Pandemic, the digital environment, and its properties became the main venue of education, and physical education was no exception in this regard. A plethora of studies are at hand concerning the significance of the digital environment (See, e.g., Kasey et al., 2017, Barahoyi et al., 2015, Javanbakht et al., 2015, Farahani & Keshavarz, 2003). Although the integration of traditional and modern venues of education is new, many educationalists, such as teachers, may lack adequate literacy and knowledge and argue against the use of technology within classroom and school contexts. However, the spread of technology makes it inevitable for educational systems to neglect their role and importance. In this study, we divided this environment into three layers; namely, (1) virtual infrastructures, (2) virtual teaching methods, and (3) technology literacy, and the analyses revealed that among these factors, technology literacy is the most important aspect and teaching methods and infrastructures were listed as the 2nd and 3rd in the overall importance. As far as digital literacy is concerned, the ability to create digital content was the essential part. Within the virtual teaching method, the teachers' capabilities to run sports festivals and document them via films and pictures are of utmost importance. However, one must not forget that maintaining motivation in all students within a digital education is not an easy task. Teachers must apply the methods by which the students sustain their commitment to learning and participating in the activities. The fact that digital infrastructure has been listed as the least important one is that within the Iranian context, there may be many places, such as rural regions, where the technology is yet to enter the educational environments. Another reason

may be that the speed of the net and its accessibility are not equal within all provinces. The students and teachers have problems accessing the so-called digital environments. Additionally, one can argue that the inclusion of digital environments and technology within the educational system contradicts the active nature of physical education; however, the COVID pandemic proved that there are potentialities for such settings to be applied within all contexts with proper care and pre-requisites.

Utilizing all aspects of the school environment (physical, digital, and social) effectively and simultaneously is a complex endeavor. It is worth mentioning that considering physical and digital environments without paying enough attention to the social aspect does not guarantee the creation of an active school as a result. The results of the present study manifested that digital and physical environments are indirectly linked to the social aspects and were effective in achieving active schools, which reminds us of the interpretations that Bronfenbrenner (1999) had about the role of social context and environment. In Bronfenbrenner's (1999) bioecological model, adolescents' and youngsters' growth is dependent on the environment where they live. In the model, the living environment is divided into four layers. The microsystem is the core aspect of one's personal, physical, and psychological properties. The next layer, i.e., mesosystem, signals the role of connections such as family and friends. The exosystem is the third layer where particular social organizations such as schools are listed. Finally, at the macrosystem, the cultural and ideological values are addressed and it is in this layer that ideas for involvement and participation in activities are rooted. As we previously put forward, according to this model, one's eagerness to involve in an activity would not trigger unless factors such as exploration, manipulation, imagination, and interpretation are present within a social environment.

In justifying the indirect relations that the digital environment had with the social dimension, it can be claimed that within virtual education, the underlying social factors; namely, teachers, families, school management, and peers are the main actors, and the most essential role of the digital environment is to provide the basis for maintaining the interaction between the social factors in an online manner (Fabian & MacLean, 2014). As a result, if the prerequisites of utilizing digital and physical environments are fulfilled, the educational system can move towards its goals and standards more efficiently.

The designed model in this research is based on Smith et al.'s (2020) CAS model and Active School Document published by the Ministry of Education in 2019 in which all types of environments are linked and affect each other. According to Bronfenbrenner (1999), the individuals who are members of a complete system respond to the environmental triggers and

attempt to be effective and try to reconstruct the system and environment surrounding them. Therefore, in line with operationalizing the principle 6.6 of FRDE for creating networks of learning environments and effective interactions of schools with such networks, authorities, and policymakers of the Iranian context would follow the suggestions of FRDE so that the active school environments are enriched with countless opportunities for students and other stakeholders to move towards personal and social health and growth. In this vein, the Ministry of Education in Iran and elsewhere must beware of the potentialities that physical, digital, and social environments provide. The fact is in line with principles 3.8, 1.7, 2.14, 8.14, 14.3, and 4.17 of the FRDE. It is suggested that future studies use a qualitative approach to provide the existing knowledge with more depth and quality. Furthermore, the situation of physical activities within the apartment environment and how this somehow limited environment can benefit the students and other family members can be the topic of future studies.

Authors' Contributions

Authors were involved in all sections of the present research; including the stages of writing, data collection and analyses, discussion, and revision.

Acknowledgments

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Conflict Interest

The authors declare that they have no competing interests.

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