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Dominant Types of Multiple Intelligences in Oman: Sport Practitioners vs Non-Practitioners

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This study aimed to investigate the dominant types of multiple intelligences among regular sports practitioners, as well as to make a comparison in the types of intelligence between sports practitioners and non- practitioners. Exercise Behavior Scale and Multiple Intelligences Scale were electronically administered concurrently to 406 Omani sports practitioners and non-practitioners (298 males, 108 females; Age $_{Mean}$ 25.39 ± 6.67). Descriptive statistics and Multivariate Analysis of Variance (MANOVA) were used to analyze the data. The present-defined sports practitioners exhibited higher levels of bodily-kinesthetic, social, emotional, and naturalist intelligence while having low levels of musical and linguistic intelligence. In general, the differences between the levels of the eight types of intelligence in both groups were in favor of sports practitioners but did not reach the significance levels except for only two types of intelligence, namely physical-kinesthetic intelligence, and emotional intelligence. The present study laid the groundwork for the utilization of the multiple intelligences paradigm to explore the topology of the multiple intelligences among regular sports practitioners vs non-practitioners. This, in turn, could lay the foundation for identifying temperaments to foster sport and well-being.

Keywords: *multiple intelligences, sports activities, Oman*

Introduction

The traditional views on the concept of intelligence remained prevalent until 1983 as Gardner (2011), criticized the idea that there is only one type of intelligence measured by extant measures for intellectual quotient (IQ). In traditional IQ tests, the goal is to tap into your reasoning and problem-solving abilities. Gardner suggests the traditional IQ model tends to focus narrow part of human higher faculty and thus overlooks significantly other abilities that are essential for survival. Gardner postulated that humans tend to have variant abilities including social, emotional, musical, linguistic, and other abilities (Gardner 2011). In reference to Gardner's model of multiple intelligence, Armstrong (2009) argues that every intelligence is not a distinct entity. Instead, when individuals participate in an activity, they often develop more than one type of intelligence. A child kicking the ball to a teammate needs physical-kinesthetic intelligence to run, control, and kick, and spatial intelligence to expect the movement of the other

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teammate to anticipate the trajectory and direction of the ball towards the right place, and also needs linguistic intelligence and emotional intelligence to clarify his point of view and control his emotions (Armstrong 2009).

Multiple intelligences Theory (MIT) argues that although multiple intelligences have genetic roots, they can be enhanced and grown with influences from the surrounding environment and other life practices (Gardner 2011). Several studies have recommended the adoption of the principles of Gardner's theory of multiple intelligences as a theoretical basis for studying the multiple aspects of intelligence (Nwadike and Zhang 2021). Thus, many studies in different environments aimed to identify the multiple intelligences' profiles that characterize athletes and sports practitioners. Some of them explored that the most dominant types of intelligence that distinguish sportsmen, were bodily-kinesthetic intelligence, followed by interpersonal intelligence, while linguistic intelligence occupied the lowest ranks among the eight types of intelligence (Kutz et al. 2013).

Studies also demonstrated that competitors' athletes and sports practitioners for other purposes differ from their non-athletes or sports practitioners in many characteristics (Bara Filho et al. 2005, Malinauskas et al. 2014, Singh 2020, Kumar and Vishal 2013). Furthermore, studies revealed that regular sports practitioners not only develop bodily-kinesthetic intelligence but also develop multiple types of intelligence (Pérez et al. 2003), where they have increased levels of emotional intelligence and social intelligence compared to non-regular sports practitioners (Hong-shih and Wen-chang 2011).

To date, the data on this type of endeavor has largely emanated from developed countries. With the growth of sports industries, some establishment of characteristics of sports practitioners is therefore warranted. In developing countries, there were fewer attempts to investigate the dominant types of intelligence among athletes and sports practitioners with a few exceptions. Shafi'a et al. (2018) have investigated multiple intelligences of the athletes, that logical intelligence ranked first, followed by social intelligence in second place, and emotional intelligence in third place and concluded that there is a positive correlation between multiple intelligences and leader ship behavior. They concluded that intrapersonal intelligence, logical intelligence, and bodily intelligence are contributors to leadership behavior.

Another study concluded that volleyball players participating in the Jordanian Premier League have the highest emotional, social, and then bodily-kinesthetic intelligence, while their linguistic intelligence is ranked the lowest (Al Widyan 2016).

In Oman, Al-Rawahi and Zayed (2018) explored that the most types of intelligence that characterize physical education major students were social, emotional, and bodily-kinesthetic intelligence, while the least types were musical and logical intelligence. The study concluded that academic specialization could be specific predictor of the most dominant types of multiple intelligence

In this current study, we seek to identify the types of intelligence prevalent in the Oman population of those who pursue regular sports or otherwise. Oman is one of those countries in the Arabian Gulf with a pyramidal-like structure and this implies the preponderance of 'youth bulge'. Concurrently, the country has

generally triumphed over communicable diseases but started to witness an increasing number of non-communicable diseases amid a sedentary lifestyle. As is often the case, in such population structure and patterns of diseases, lifestyle changes such as increasing physical activities like exercises (Al Siyabi et al. 2021). Within such background, this study aims to identify types of intelligence dominant in people who have regular sports practitioners vs. non-practitioners. The present sentinel study has the potential to shed light on enhancing the understanding temperament of people who peruse regular exercise again those who do not. In the age of high non-communicable diseases, non-sedentary life has been shown to decrease healthcare utilization and increase the wellness of the population. Thus, this study has embarked to answer the following two questions: (i) what are the most dominant types of intelligence among Omani regular sports practitioners vs. those who do not; and conversely (ii) are there any differences in the types of intelligence between sports practitioners and non- practitioners?

Significance of the Study

This study will contribute to revealing the potential effects of engaging in sports and exercise during leisure time on multiple intelligences. It is expected that the results of this study will contribute to enhancing the understanding of sports and exercise practitioners' characteristics, especially since there is a lack of studies that dealt with this issue specifically in the eastern environment.

Methods

Setting

Invitations were extended through social media to approximately 850 Omani to participate in this study. After cleaning the data and excluding cases over the age of 32 and under the age of 18, the total number of participants reached 406, and all of them agreed to get part in this study in writing. The participants were classified according to their scores on the Exercise Behavior Scale, into two groups: Sports practitioners and non-practitioners.

Sample

Due to the limited access to a full list of the individuals in the larger study population, we used a non-random sampling, namely the convenience sampling method. A total of 406 (298 males; 108 females; Age $_{\text{Mean}}$ 25.39 ± 6.67) participated in the study by responding to the electronic questionnaire.

Measures

The study proforma has three parts. One is sociodemographic (age and gender) information of the participants. The second and third parts consisted of two outcome measures, *Exercise Behavior Scale* and *Multiple Intelligences*. These will be described below in tandem.

Exercise Behavior Scale

The scale was developed by Zayed et al. (2021). The content validity of the scale was proven previously by presenting it to eight academic referees specializing in the fields of physical education and sports sciences. The scale relies on collecting information from the participants regarding their daily exercise behavior during their leisure time. The scale covers three dimensions: (1) exercise intensity, (2) exercise frequency each week, and (3) period exercise duration. According to their responses, the participants were classified into two groups (practitioners and non-practitioners based on the criteria identified by the recommendations emanating from the initial and updated American Heart Association (Garber et al. 2011) and the U.S Department of Health and Human Services (Haskell et al. 2007). Accordingly, the participants were divided into two groups: regular sports practitioners vs. non-practitioners. Sports practitioners are defined as those who engage in one or more moderate-intensity sports activities (such as brisk walking, jogging, soccer, swimming, volleyball, and handball) at a minimum rate of two and a half hours per week, or engage in high-intensity sports (such as running, hiking, climbing and weightlifting) for up to an hour and a half per week minimum. Sports non-practitioners are defined as those who do engage in sports and exercise at all or who do it at rates that do not reach the recommended levels (less than two and a half hours of moderate-intensity activities or less than an hour and a half of high-intensity activities).

Multiple Intelligences Scale

The variation in multiple intelligences was derived from the theoretical model of multiple intelligence initially proposed by Gardner (2011). A short version of the Arabic Scale of Multiple Intelligences developed by Al-Rawahi and Zayed (2018) was used. The value for Cronbach's Alfa for the scale was α=0.87. The scale covers eight types of intelligence (linguistic, musical, bodily kinesthetic, spatial, social, emotional, logical-mathematical, and naturalist). The scale consists of 24 statements covering the eight different types of intelligence. Each statement could be answered either affirmatively or negatively by determining the extent to which the respondents agreed or not agreed according to the Likert method (Strongly Agree - Agree - Not Sure - Disagree – Strongly not Agree). Table 1 shows one example of each of the three statements that represent each type of the eight types of intelligence.

Table 1. *Subscales of Multiple Intelligences and Their Constituent*

Intelligence Type	e.g. Statement
Linguistic Intelligence	I can easily express what's on my mind, spoken or written
Musical Intelligence	If I listen to a song once or twice, I can memorize it
Bodily-Kinesthetic Intelligence	I can imitate the movements performed in front of me
Spatial Intelligence	I don't find it difficult to read maps and graphs
Social Intelligences	I can understand the personalities of the people I deal with
Emotional Intelligence	I can control my temperament and mode.
Logical-mathematical	I can do arithmetic operations mentally with ease
Naturalist Intelligence	I enjoy meditating on planets and stars

Statistical Analysis

Descriptive statistics were used to explore the dominant types of intelligence among the two groups, while multivariate analyses were utilized to determine the effect of exercise on multiple intelligence.

Results

To answer the first question of the study, which states, "What are the most dominant types of intelligence among Omani regular sports practitioners?" Descriptive statistics were used, as shown in Table 2.

Table 2. *Means and Standard Deviations of Common Types of Intelligence among Sports Practitioners (n=264)*

	Mean	Std. Deviation	Rank
Bodily-Kinesthetic intelligence	3.9684	0.75650	1
Social Intelligence	3.9268	0.72299	2
Emotional intelligence	3.9230	0.77588	3
Naturalist intelligence	3.5985	0.90834	4
Logical intelligence	3.5492	0.90724	5
Spatial intelligence	3.3902	0.75502	6
Linguistic intelligence	3.2904	0.68776	7
Musical intelligence	3.2109	0.80118	8

Table 3. *Means and Standard Deviations of Common Types of Intelligence among Sports Non-Practitioners (n=142)*

	Mean	Std. Deviation	Rank
Social Intelligence	3.7981	0.65469	1
Emotional intelligence	3.6854	0.72637	2
Naturalist intelligence	3.4390	0.89686	3
Bodily-Kinesthetic intelligence	3.4390	0.75988	4
Logical intelligence	3.4014	0.97287	5
Spatial intelligence	3.2723	0.73376	6
Linguistic intelligence	3.2089	0.72619	7
Musical intelligence	3.0634	0.83740	8

Table 2 shows that the dominant types of intelligence among the practitioners are bodily-kinesthetic intelligence, social intelligence, and emotional intelligence, while the lowest types are musical intelligence and linguistic intelligence.

Table 3 shows that the dominant types of intelligence among non-practitioners are social intelligence, emotional intelligence, and kinesthetic-bodily intelligence, while the lowest types are musical intelligence and linguistic intelligence.

To answer the second question of the study which stated, "Are there any differences in the types of intelligence between sports practitioners and non-practitioners? MANOVA was used to compare means differences between the two independent samples: Practitioners (n=264); and non-practitioners (n=142), as shown in Tables 4-6.

Table 4. *Means and Standard Deviations of Sports Practitioners (n=264) and Non Practitioners (n=142) of Indices of Multiple Intelligences*

		Mean	Std. Deviation	SE Mean
Linguistic	Practitioners	3.2904	0.68776	0.04233
	Non-practitioners	3.2089	0.72619	0.06094
Musical	Practitioners	3.2109	0.80118	0.04931
	Non-practitioners	3.0634	0.83740	0.07027
Bodily	Practitioners	3.9684	0.75650	0.04656
	Non-practitioners	3.4390	0.75988	0.06377
Spatial	Practitioners	3.3902	0.75502	0.04647
	Non-practitioners	3.2723	0.73376	0.06158
Social	Practitioners	3.9268	0.72299	0.04450
	Non-practitioners	3.7981	0.65469	0.05494
Emotional	Practitioners	3.9230	0.77588	0.04775
	Non-practitioners	3.6854	0.72637	0.06096
Logical	Practitioners	3.5492	0.90724	0.05584
	Non-practitioners	3.4014	0.97287	0.08164
Naturalist	Practitioners	3.5985	0.90834	0.05590
	Non-practitioners	3.4390	0.89686	0.07526

Table 5. *Multivariate Tests for the Effects of Exercise and Sports Activities on Multiple Intelligences*

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	0.977	2080.697[b]	8.000	397.000	0.000	0.977
	Wilks' Lambda	0.023	2080.697[b]	8.000	397.000	0.000	0.977
	Hotelling's Trace	41.928	2080.697[b]	8.000	397.000	0.000	0.977
	Roy's Largest Root	41.928	2080.697[b]	8.000	397.000	0.000	0.977
Exercise	Pillai's Trace	0.115	6.442[b]	8.000	397.000	0.000	0.115
	Wilks' Lambda	0.885	6.442[b]	8.000	397.000	0.000	0.115
	Hotelling's Trace	0.130	6.442[b]	8.000	397.000	0.000	0.115
	Roy's Largest Root	0.130	6.442[b]	8.000	397.000	0.000	0.115

a. Design: Intercept + Exercise
b. Exact statistic

Table 5 shows that there were significant differences in participants' multiple intelligences based on their involvement in exercise F (8, 397)=6.442, p<0.005; Wilk's=0.885, Partial η^2=0.12. To determine how multiple intelligences, differ according to the independent variable (exercise's involvement), Table 5 presents the nature of the effects:

Table 6. *Tests of Between-Subjects Effects*

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Linguistic	0.613[a]	1	0.613	1.246	0.265	0.003
	Musical	2.008[b]	1	2.008	3.031	0.082	0.007
	Bodily	25.885[c]	1	25.885	45.089	0.000	0.100
	Spatial	1.282[d]	1	1.282	2.294	0.131	0.006
	Social	1.528[e]	1	1.528	3.119	0.078	0.008
	Emotional	5.210[f]	1	5.210	9.044	0.003	0.022
	Logical	2.018[g]	1	2.018	2.330	0.128	0.006
	Naturalist	2.350[h]	1	2.350	2.873	0.091	0.007
Intercept	Linguistic	3900.342	1	3900.342	7927.845	0.000	0.952
	Musical	3634.865	1	3634.865	5485.733	0.000	0.931
	Bodily	5066.383	1	5066.383	8825.149	0.000	0.956
	Spatial	4098.589	1	4098.589	7331.840	0.000	0.948
	Interpersonal	5509.990	1	5509.990	11247.826	0.000	0.965
	Intrapersonal	5345.100	1	5345.100	9279.163	0.000	0.958
	Logical	4460.846	1	4460.846	5150.208	0.000	0.927
	Naturalist	4572.957	1	4572.957	5591.454	0.000	0.933
Exercise	Linguistic	0.613	1	0.613	1.246	0.265	0.003
	Musical	2.008	1	2.008	3.031	0.082	0.007
	Bodily-kinesthetic	25.885	1	25.885	45.089	0.000	0.100
	Spatial	1.282	1	1.282	2.294	0.131	0.006
	Social	1.528	1	1.528	3.119	0.078	0.008
	Emotional	5.210	1	5.210	9.044	0.003	0.022
	Logical	2.018	1	2.018	2.330	0.128	0.006
	Naturalist	2.350	1	2.350	2.873	0.091	0.007
Error	Linguistic	198.760	404	0.492			
	Musical	267.692	404	0.663			
	Bodily	231.930	404	0.574			
	Spatial	225.841	404	0.559			
	Social	197.908	404	0.490			
	Emotional	232.717	404	0.576			
	Logical	349.924	404	0.866			
	Naturalist	330.410	404	0.818			
Total	Linguistic	4519.222	406				
	Musical	4322.000	406				
	Bodily	6068.889	406				
	Spatial	4780.556	406				
	Social	6317.111	406				
	Emotional	6224.333	406				
	Logical	5318.444	406				
	Naturalist	5428.333	406				
Corrected Total	Linguistic	199.373	405				
	Musical	269.700	405				
	Bodily	257.815	405				
	Spatial	227.123	405				
	Social	199.436	405				
	Emotional	237.927	405				
	Logical	351.942	405				
	Naturalist	332.760	405				

As shown in Table 6 there is a significant effect of exercise on two of the eight M, which are bodily-kinesthetic intelligence F (1, 404)=45.089, $p<0.005$; partial $\eta^2=0.10$ and emotional intelligence F (1, 404)=9.044, $p<0.005$; partial $\eta^2=0.022$.

Discussion

The main goal of this study was to explore the types of multiple intelligences profiles of sports practitioners. The results of the study revealed that the most dominant types of intelligence among sports practitioners are bodily-kinesthetic intelligence, followed by social intelligence, and emotional intelligence. It also found that the least types of intelligence they have are musical intelligence and linguistic intelligence. It also found that sports practitioners significantly differ from their non-practitioner counterparts in bodily-kinesthetic intelligence and emotional intelligence.

The results of this study which indicated that kinesthetic-bodily intelligence, social intelligence, and emotional intelligence are the most dominant types of multiple intelligences seem to be expected considering that the most important characteristic of sports practitioners is their motor skills and physical abilities that enable them to manipulate and control their movements in sports settings accurately and precisely. Additionally, it's also expected that the context of sport is rich in many situations that provide athletes and sports practitioners with opportunities to socially interact with others and at the same time practice control over their feelings and emotions, which may help them to enhance social and emotional intelligence and consequently improving their psychological and social competencies (Aouani et al. 2022). In addition, these results provide new evidence in another environmental and cultural context to support the previous literature about the most prevalent types of intelligence among athletes or sports practitioners, or undergraduate physical education undergraduate students (e.g., Yildiz et al. 2020, Şuruba-Rusen et al. 2021, Nwadike and Zhang 2021, Nikolaenko and Kolosova 2020, Hong-shih and Wen-chang 2011) which concluded that the common factor between the intelligence profile of athletes in team and individual games is kinetic intelligence and that the most important distinguishing features of athletes from non-athletes are kinetic intelligence, social intelligence, and emotional intelligence.

With regard to the result, that sports practitioners and non-practitioners have low levels of musical intelligence, it can be explained that the Islamic culture prevailing in Oman does not encourage modernized music due to religious considerations. This result confirms what some studies have indicated (e.g., Zaid 2018) which concluded that some types of music are considered unacceptable according to the Islamic jurisprudential perspective.

As for the result related to the relatively low level of language intelligence among sports practitioners, this may be because many sports practitioners are generally more interested in physical activities than in other activities such as reading and writing. This result is consistent with the findings of a study (Kutz et al. 2013), which concluded that linguistic intelligence among athletes ranked as the lowest type of intelligence. At the same time, this result partially differed from the findings reached by Emis and Imamoglu (2013) which concluded that exercise has positive effects on linguistic intelligence in addition to kinesthetic-bodily intelligence and social intelligence.

Conclusions

The study resulted in defining Omani sports practitioners' profile of multiple intelligences and concluded that sports practitioners may develop the kinds of intelligence that can help in achieving their sport-related goals such as kinesthetic intelligence, emotional intelligence, and social intelligence. The study also concluded that sports practitioners outperform their non-practitioners counterparts in all types of intelligence, which confirms that practicing sports contributes to achieving many positive effects on all types of multiple intelligences. Lastly, the study laid the groundwork for the utilization of the multiple intelligences paradigm to explore the topology of intelligence among regular sports practitioners vs. non-practitioners. This, in turn, could lay the groundwork for the identification of temperaments to promote sport and well-being.

Limitations

The results of the current study are difficult to generalize to the target population for two reasons: the first relates to the method of selecting the sample, and the second relates to the validity and reliability indications of the used tools. More studies on this endeavor are therefore warranted. Secondly, the present cross-section study is hampered by the confounder of difficulty to delineate temporal relationships. Thirdly, online the survey might accrue responses from those individuals who are computer savvy rather than the general population.

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