

Investigating the Impact of the Environmental and Spatial Dimension of the Health Sidewalks of Ardabil on People's Tendency to Participate in Physical Activity

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Abstract

Purpose: This study aimed to investigate the effect of the environmental and spatial aspects of healthy pedestrian paths on the tendency of people to participate in physical activity in the city of Ardabil, Iran.

Methods: This research possesses an applied purpose and contains descriptive and field research methodology. The statistical population of this study was formed by a large number of people who used the health walkways of Ardabil for exercise and recreation. In this research, 545 people completed the questionnaire and according to Morgan's table, 384 people were randomly selected as the statistical sample of this research. Descriptive statistics and inferential statistical methods were used for appropriate evaluation and analysis, which were derived from the tables, frequencies, percentages, averages, and standard deviations. In addition, the median distribution was used to determine the normality of the data, the one-sample t-test was used to test the research hypotheses, and multiple regression was used for intragroup correlation. To check and analyze the obtained information, SPSS 26 was used, with a significance level of $P \leq 0.05$.

Results: The findings of the current study showed that there was a statistically significant difference in the average environmental and spatial dimensions of the Health Sidewalks in Ardabil on the tendency of people to participate in physical activity ($P \leq 0.001$).

Conclusion: The results of the present research showed that the aesthetic elements under the influence of different components significantly increased the tendency of citizens toward physical activity.

Introduction

The growth in urban population, the advent of mobile vehicles into urban life, and the evolution of citizen-citizen relationships have all impacted the aesthetic appeal of streets and sidewalks and led to an overemphasis on motor commuting. Urban planners and managers have made solving such issues the primary requirement for the economic and social prosperity of a city. Consequently, it has become increasingly difficult to access walking spaces and places that encourage social interaction in urban areas, and many people have eventually lost the opportunity to move and travel on foot due to the widespread use of vehicles (Akbarzadeh et al, 2016). In the past, health professionals and researchers' focus had been drawn to issues such as decreased physical activity, inactivity, and the complications that result from them. Sports equipment use and movement have a direct impact on evoking feelings, emotions, and a spiritual link with the world, which, in turn, result in enhancing life, regaining psychological balance, serenity, and removing oneself from daily stresses (Chisura, 2004:133). In 2013, the World Health Organization identified inactivity as the fourth leading cause of mortality worldwide (Alimardani et al, 2018). Meanwhile, the most recent reliable statistics show that nearly 30% of the country's middle-aged community does not engage in the minimum level of physical activity (Hakimian, 2016). Health experts believe that an interdisciplinary approach to healthcare as well as the cooperation and participation of other scientific institutions that have typically been distant from public health will be necessary to address the issue of non-contagious diseases in society. The literature and political decisions of various nations bear witness to this development as they draw attention to the problem of "improving the local community's standard of health with the aid of design" (Saberipour, Elahi, Rouholamini, & Zamani, 2019).

Tendency toward sports: Due to the spread of diseases, population changes, technological advancements, and the widening social class gap, members of society today are experiencing health issues that are unique in nature. With the prevalence of modern, sedentary lifestyles, infectious illnesses, namely cancer, heart disease, and mental illness now account for a higher rate of fatalities (Nakheiniazi & Abbasnezhad, 2019). Additionally, sports have taken on a significant position and valuable role in the economy by influencing people's health, spending healthy, happy, and enjoyable free time, education and training of people, especially the younger generation, fostering social connections between people, preventing diseases, preventing social corruption and moral deviations that are spreading in society, along with various other applications (Shabani & Khaje, 2017).

Physical activity and exercise, as well as participation in sports programs, is considered as a special and main dimension of a healthy and appropriate lifestyle (Jose & Patrick, 2017). More than physical effects, this factor improves positive interpersonal and psychological characteristics among people in the society (Skinner & Zakus, 2008). Creating a proper link between people with sports and physical activity has positive and appropriate effects on the factors of physical fitness (Angevaeren et al, 2008), perception of well-being (Schulz & Meyer, 2012), and health (Li & Siegrist, 2012). Given these interpretations, it is not surprising that advanced and developed nations' policies tend to increase the quantity of physical exercise in their populations (Allen & Ross, 2013). Sports facilities, sports venues, and sports spaces must be planned, supplied, and operated to satisfy the needs, interests, and expectations of all social groups at various levels. Having all these points in mind, it can be concluded that a safe and healthy environment is beneficial for people's happiness, health, and ability to develop their talents (Vazifehdan MollaShahi et al, 2021). This viewpoint

contends that one of the following public health strategies should focus on how environmental architecture and physical space can influence other significant aspects of health, particularly people's propensity to engage in physical activities (Hakimian, 2012). Adults should be urged to use walkways and engage in general physical activity. Several studies have argued how important it is for there to be walking and cycling facilities, as well as how important it is for those facilities to be of a high standard and to be properly coordinated with one another (Kirtland et al, 2012). Similarly, a great number of studies have investigated the potential effects of the design of the space on increasing physical activity in people Ord et al. (2013), Lennon et al. (2017).

One of the factors that can be influential in increasing public tendency toward sports and physical activity is aesthetics science. In its broadest meaning, aesthetics looks at how people experience their surroundings and where they fit into them. The term aesthetic is originally a Greek word which means perception. Since the time of Socrates, aesthetics has emerged as a complex subject for debate among artists, philosophers, and architects. More recently, aesthetics has also become a discussion topic for psychologists. Currently, environmental administrators and builders have both taken aesthetics into account Morten et al. (2010), Court (2017), and Razavi et al. (2018). A unique viewpoint on the aesthetic aspects of sports venues, including the dimension of surroundings and space, can be found. Ascetics is related to perception and audience foster feelings, perceptions, tastes, and attitudes toward the study of aesthetics (Khanjani & MoeinFard, 2017). In other words, aesthetic entails both conceptual and theoretical meaning and both aesthetic beauty and natural beauty are addressed in it (Norouzi & Mottaghi, 2009). As technology has developed and people's levels of physical exercise have decreased, sports venues have been transformed into healthy sidewalks in public areas, trying to

address the challenge with sports and the construction of appropriate sports spaces. Nowadays, a great deal of attention is being paid to building such places; however, they are expensive to build. Now that sport venues are increasingly being built, the main questions are whether the fundamental architectural principles are observed in building such sports facilities, and whether they encounter difficulties and operational issues in using them? Clearly, the response to this question is "no," as there are weaknesses as well as flaws and shortcomings in designing sports facilities (Nobakht & Moharramzadeh, 2014).

Attracting people is currently the primary objective when designing and constructing sports venues. In a way that, by excellent performance and good planning, they can draw residents there frequently and continuously (Nazemi, 2013). People can be drawn to sports environments by paying particular attention to factors such as environment and space, which are among the most significant aesthetic elements for attracting and motivating individuals to participate in sports.

Environment: If non-artificial elements of the environment, such as water, lovely flowers, and beautiful trees, are used in the development and design of the sports environment, it not only helps to identify the environment but also offers a great deal of comfort and pleasure (Vaezi, 2018) to the people present in that environment (Grutter, 2008).

Space: Space is characterized as a vacuum that can hold something. Man requires a place which enables him to keep himself safe from outside influences. Over time, this need has changed but it still has continued to exist. From architectural point of view, internal spaces encompass interior spaces, which are created by human beings and their primary objective is to safeguard against environmental effects (Grutter, 2008). As it is argued by Bentley et al. (2010), policies and research in this field should focus on factors in the environment that

influence how much most people enjoy sports and physical activities. One such scenarios involves aesthetics and how people perceive beauty, which in the present study, it refers to public spaces like parks and sporting sites with natural landscapes. Similarly, Cleland et al. (2010) observed that people's health behavior is affected by the environment's attractiveness and aesthetics. They further witnessed that there is a positive correlation between environmental factors like aesthetics and people's willingness toward activities. By paying more attention to aesthetic factors like space and surroundings, one can make a citizen who exercises in these areas feel good and draw attention to him, which will motivate him to come back (Razavi & Azimi, 2014).

In this research, various aspects have undergone investigation. The environmental dimension is concerned with the location of the sport venue in a natural environment, utilization of artwork, and aesthetic appearance. Moreover, the spatial dimension is generally leaning toward a multi-functional space, size and scale, vastness and openness of the space, and the concinnity of the internal space (Mousavi, 2014). In today's machine era, people are well-wised of the significance of sports and sports venues for engaging people in physical activity. Many people in the society, particularly young people, can find a suitable setting to spend their free time on footpaths and sports fields. Subsequently, the attractiveness of a setting can greatly influence the extent to which people participate in sports (Razavi & Azimi, 2014). Therefore, one of the factors that can attract more people to such venues is the aesthetic factor. Numerous studies have been done on this field. Saadati et al. (2023) in a study titled Application of Observational Study in Order to Design Urban Pedestrian Environment Based on User's Behavioral Patterns, reported that the most important factors that are influential in different behaviors in order to increase quality, attraction, and the attendance of users at the venue are an increase

in the quality of the floor coverings, the quality, quantity, and the positioning of the urban furniture, the widening of the paths, utilization of the natural complications, providing a variety of paths, and increasing safety and security. Moreover, a lack of synchronization between the behavior and the planned spaces, small and concentrated activities, paths with no security and supervision will result in the users refraining from using the paths and their behavioral diversion from the walkways. In another study called Recognizing the physical-objective indicators in the aesthetics of the urban wall by prioritizing individual perceptions, Ghaempanah et al. (2023) concluded that the urban walls within the walkways need a boost in their aesthetics and visual beauty, attention to their facade, and a special touch in the usage of various materials. In addition, citizens evaluated the lack of confusion and visual disturbance in the walkways with an impact factor of 0.82 to be positive and appropriate and considered this factor as their highest priority in their visual preference. Granted, Memarian et al. (2022) in a study titled Designing an Aesthetic and Functional Quality Model in the Iranian Premier League Clubs, found a significant correlation between the game atmosphere and aesthetic quality, crowd experience and beauty quality, the service staff and functional quality; access to the facilities and functional quality, spectators' position and functional quality, aesthetic quality and functional quality. In his book, Jalali Farahani (2022) argues that when building sports facilities, equipment, and tools, both the aesthetics and quality of the services provided to users should be taken into account. Essentially, a city or area can be judged by the number (quantity), type (quality), and availability of sports facilities, equipment, and facilities. As a result, it is essential that the design of sporting venues reflect the society's building aesthetic and cultural values. Likewise, places, facilities, and sports equipment designed for resting, exercising, and

spending leisure time should have enough capacity, be in a good location, be user friendly, and be attractive as well as beautiful. Mumford et al. (2022) conducted a study entitled "Sports and art aesthetics: competition and complement." According to the researchers, focusing on the aesthetic aspects of sports can increase participation rates and provide an opportunity to greater communication between sports and aesthetics. However, there have been few studies conducted so far on the relationship between the aesthetic attributes of Ardabil City's health sidewalks and the likelihood that residents will engage in physical activity. However, the objective of the present study is to explore the variables influencing the environment and layout of Ardabil City's health sidewalks as well as people's willingness to engage in physical activity. Specifically, the researcher wants to know whether the aesthetic qualities of Ardabil City's health sidewalks encourage people's participation in physical exercise.

Materials and Methods

Methodologically speaking, the present field study is a descriptive one and it has applied purposes. Participants of the study are Citizens of Ardabil who frequently used this city's health sidewalks for recreation and exercise purposes. Primarily, 545 participants completed the questionnaire and following Morgan's table, 384 participants were randomly selected to make up the statistical sample. The inclusion criteria for participants were to live in Ardabil City for at least one year and use the city's sidewalks at least three days per week. The exclusion criterion was not willing to participate in the study. In order to measure the impact of the aesthetic quality of the city of Ardabil's sidewalks on residents' levels of physical activity, the best and most thorough technique of data collection is the use of appropriate questionnaires. The researcher developed a questionnaire in order to assess individual's tendency toward general physical

activity. The items were adapted from the Sports Facilities Aesthetics questionnaire developed by Shalika (2013) and the Physical Activity Questionnaire (Shahlaei, 2011). By adding the items related to the demographic data, the final version of the questionnaire ended up with 23 items with a 5-point Likert scale (1 = very little to 5 = very much). The questionnaire had two underlying constructs, namely environment and space, with five questions evolving around the environmental dimension, four questions on the dimension of space, and 14 questions concerning the participants' tendency toward physical activity. The validity was checked by experts of the related field. Experts were asked to review the questionnaires and provide feedback. Based on the feedback received from the experts several changes were in the questionnaire. Taking into account that Cronbach's alpha is a way of assessing reliability by comparing the amount of shared variance, or covariance, among the items making up an instrument to the amount of overall variance, the reliability of the questionnaire was checked by Cronbach's alpha. The related Cronbach value for aesthetics questionnaire was found to be .95, suggesting a high reliability value, and for tendency toward physical activity .73, suggesting an acceptable reliability value.

The obtained data were analyzed using descriptive statistics and inferential statistics, which include tables, frequencies, percentages, averages, and standard deviations. The normality of the distribution of the data was checked via median. Additionally, one sample t test was employed for hypothesis testing and multiple regression was employed for checking the intragroup correlation. The obtained data was analyzed by SPSS software version 26 with a significance level of $P < 0.05$.

Results

In this section, the demographic data of the 384 Ardabil province residents who participated in this study is presented. As it can be seen in

Table 1, the age range between 20 and 24 years had the greatest percentage of frequency (33.8), and the age range below 20 years had the lowest percentage of frequency (3.3). Men had a 41.1% involvement rate while women had a 58.9% participation rate. Additionally, the percentage of single participants was 31.4% higher than the percentage of married participants. People with bachelor's degrees had the highest percentage (40.9) of all educational levels, while those with Ph.D. degree had the

lowest percentage (5.1). Individuals with 5 to 9 years of physical exercise experience had the highest frequency (29.4), and those with 15 to 19 years of physical exercise experience had the lowest frequency. The lowest frequency percentage was related to those who were employee of government or organizations (23.4), and the greatest frequency percentage was related to those who were unemployed (39.9).

Table 1- Descriptive Statistics of the Demographic Information of the Participants

Variable		Frequency	Percentage	Variable		Frequency	Percentage	
Gender	Male	226	58.9	Marital Status	Single	252	65.7	
	Female	158	41.1		Married	132	34.3	
	Total	384	100		Total	384	100	
Age (years)	Less than 20	13	3.3	Educational Level	Diploma	28	7.3	
	20 to 24	130	33.8		Associate	36	9.5	
	25 to 29	88	22.9		Bachelor	157	40.9	
	30 to 34	44	11.4		Master	143	37.2	
	35 - 39	54	14		Ph.D.	20	5.1	
	More than 40	55	14		Total	384	100	
	Total	384	100		Less than 5	110	28.7	
Job Status	Unemployed	153	39.9	Sport Experience (years)	5 to 9	113	29.4	
	Self-employed	140	36.7		10 to 14	77	20	
	Employed	90	23.4		15 to 19	38	10	
	Total	384	100		More than 20	45	11.9	
				total	384	100		

As it is indicated in table 2, the aspect of the sidewalks environment significantly influences ($p < 0.001$) individual's willingness to engage

in physical activity. Additionally, the t value was found to be 31.52 and the effect size was 0.69.

Table 2- Results of the Independent Samples T-Test for the Environment Aspect

Tendency to physical activity	Environment aspect	t-value	df	p-value	effect size
2.14 ± 0.56	3.62 ± 0.81	31.52	383	0.001*	0.69

Similarly, table 3 demonstrates that aspect of the sidewalks space significantly influences ($p < 0.001$) individual's willingness to engage in

physical activity. Further, the t value was found to be 34.11 and the effect size was 0.81.

Table 3- Results of the Independent Samples T-Test for the Space Aspect

Tendency to physical activity	space aspect	t-value	df	p-value	effect size
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2.14 ± 0.56	3.88 ± 0.92	34.11	383	0.001*	0.81
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The findings of the multiple regression test, as presented in the following table (Table 4), demonstrates that when the environmental and spatial aesthetic aspects are combined, they can accurately predict people's willingness to

engage in physical activity ($P < 0.01$, $F = 5.76$). Additionally, according to the squared multiple correlation, 38% of the changes in people's willingness to engage in physical exercise can be predicted by predictor variables.

Table 4- Results of Multiple Regression Analysis of Research Variables

Source of change	Total square roots	df	Average square roots	F	p-value	R	R ²
Regression	3.58	2	1.79	5.76	0.003	0.62	0.38
Residuals	118.43	381	311				
Total	112.06	383					

Table 5- Calculation of coefficients and significance of regression of variables

Variables	B	Beta	t	p-value
Environment aspect	1/85	0/56	4/74	$P < 0.001$
space aspect	1/71	0/48	4/69	$P < 0.001$

Discussion

The results of table 2 indicated that there is a significant difference in the mean scores of the items of the sidewalks environment in people's willingness to engage in physical activity in Ardabil city. An ideal place should be a logical and realistic one. Likewise, it should be in a way that is interesting for public and attracts people to that place. The question that rises here is how much these factors can attract people's attention. By affecting citizens' mental processes, the environment aspect provides a pleasant experience as a result of individuals' participation in physical exercises which, in turn, leads to their satisfaction and loyalty in using sports venues that are beautiful, located in appropriate areas of town, located in green and forest areas of town, and places that have waterfalls, pools, and river. However, it is obvious that people prefer sports venues that are appropriate in terms of environmental aspect. A great deal of the existing literature on the aesthetics and its effects on people's

willingness to participate in physical exercises revolves around environment aspect. In this respect, Bastan Fard (2006) reported in his research that the environmental aspect in the design of sports spaces, for example, cycling paths, is of significant importance. He further maintained that the use of natural elements in enriching the environment is of great importance. In another study, Daneshyar (2006) also concluded that the aspect of the environment plays an important role in designs especially in case of women. In a similar vein, several studies have been conducted in foreign context, such as Carmack et al. (2015), Gren (2010), Salis (2009), Saintes et al. (2008), and Leslie et al. (2008), have also found that the environment's quality has a significant impact on individual's level of satisfaction, their loyalty, and the appropriateness with which they use various centers. Additionally, the environment's freshness and greenness as well as natural spaces have a significant impact on people's mental health, improving stress and depression. The results of the present study are

in line with studies, such as Bastanfar (2006), Daneshyar (2006), Carmack et al. (2015), Saintes et al. (2008), Salis (2009), Gren (2010), and Leslie et al. (2008). The connection between the environment aspect and the presence and satisfaction of people from sports centers and sports environments was also examined by Bentley et al. (2010) and Defrech (2010). The results of their investigations revealed that the environment does not foster people and users' happiness and loyalty. Therefore, the results of the present study is not consistent with their findings. This discrepancy between the findings of the current study and those of Bentley et al. can be explained by differences in the samples, the emphasis on walking sports, as well as differences in societal culture and psychological makeup. Therefore, authorities of public spaces and urban furnishings should create sports areas, sidewalks next to busy streets, and noisy areas in a natural setting away from noise and air pollution, more specifically, they should pay attention to the accessibility factor. If it is not feasible to create a place with such features in a city, it is possible to spruce up the area around sports venues and footpaths using green trees, art works like statues, fountains, pools, and the like.

The findings of Table 3 demonstrates that there is a significant difference in the mean score of the questions regarding the sidewalk's space of Ardabil city on the tendency of people to participate in physical activities. Various studies have investigated the element of space in the construction of sports venues. As an example, Naghizadeganfard (2020) and Eqbali (2007) argued that the aspect of space has a significant effect on the presence and attraction of spectators in stadiums. Likewise, Popkin et al. (2005) and Salis (2009) suggested that the factor of space and access to open sports spaces and the existence of walking paths are the factors that attract people to sports and physical activities. By highlighting the importance of the aspect of space in customer loyalty and

satisfaction, McCormack et al. (2010) argued that the factor of open space in public places, parks, large size and the existence of sports fields can be effective in encouraging people to exercise, in general, and exercise in these places, in particular. According to the results of the current study, it can be concluded that the present results are in line with that of Naghizadeganfard (2020), Eqbali (2007), Salis (2009), and McCormack et al (2010). The concept of space plays a crucial role in the field of sports. Clearly, every athlete likes to be in spacious and ideal environments. This engineering and planning of locations must be done during the building phase. However, the aspect of space should be strengthened as long as sports venues in Ardabil City, such as athletic fields, walking trails, and health roads are being built. The space of such places needs to be carefully handled in order to get the most use possible out of them. However, it is anticipated that the sports venues will be strengthened in terms of space aspects as a result of the interior beautification of these locations. The aspect of space has the power to unite people by enhancing their tendency for sports in all aspects, which motivates people to visit these places. With these justifications, it is possible to comprehend how the space factor affects people's propensity for physical exercise and open sports. Aesthetics is all about human's perception and emotion.

Conclusion

The study's findings demonstrated that aesthetic factors, such as the environment and physical space, can greatly influence citizens' propensity for physical exercise, with a 38% predictive power (Table 4). The authorities in charge of these places should use the aesthetic aspects of these places by using experts in the field of architecture and design. Clearly, this will excite the people and eventually lead to the growth of influence in these areas. According to the present findings related to the effects of aesthetics, it is recommended that managers

make use of natural resources and use works of art to attract residents' attention to the environment and sports activities. Additionally, as far as the aesthetics dimension (spatial element) of the health sidewalks of Ardabil is concerned, it is recommended that managers and authorities create a suitable and standard sports environment to foster enthusiasm and loyalty of citizens to physical activity.

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