

ORIGINAL ARTICLE



Analytical Review of Fair Distribution of Recreational and Sport Services in by Using Topsis Model

¹Mohammadreza Esmailzadeh*, ¹Kamran Faraee, ¹Majid Khorsandi Fard

¹Department of Physical Education and Spore Science, Mashhad Branch, Islamic Azad University, Mashhad, Iran.

Submitted 27 Dec 2018; Accepted in final form 01 May 2019.

ABSTRACT

Background. Fair distribution of sports facilities is very effective in the tendency of citizens to exercise. Therefore, the distribution of sports and recreational facilities in cities should be carefully and scientifically explored. **Objectives.** The purpose of this study was analytical review of fair distribution of recreational and sport services in the city of Mashhad by using Topsis model. **Methods.** The present research is a descriptive-analytical research, which is applied type that has been surveyed data collection. The statistical population of this research is the referrals of sports halls under the supervision of the Sports and Youth Organization of Mashhad, and Mashhad municipality and their total number is 25,000 and according to the Morgan table, 341 people were selected from the Sports and Youth Organization sport halls and 347 from the halls under the supervision of the municipality were selected as the statistical sample. The data gathering tool is a researcher-made questionnaire that measures fair distribution. The validity of the research tool was verified by ten sports management professors and its reliability was calculated by Cronbach's alpha of 0.785 and indicates a high reliability of the research tool. Topsis method was used to analyze the data. **Results.** The research findings showed that in Mashhad, in addition to building sites, regardless of the fair distribution of urban areas, facilities were also unfairly distributed (Zone 1 ranked 0.9995 and Zone 6 ranked 0.8226. **Conclusion.** In order to develop and expand the city of Mashhad, there is a strong need for proper decision making and fair implementation of urban projects and the equitable deployment of sports equipment in Mashhad, as well as fair distribution of them in the 13 areas of Mashhad.

KEY WORDS: *Sports and Recreational Facilities, Distribution of Places, Urban Health Services, Topsis*

INTRODUCTION

Exercise and physical education as an important scientific and educational issue in the development of physical and psychological forces of individuals are currently of interest to many countries in the world. Some countries have taken important steps to achieve the major goals of physical education and sport, with basic planning and investment, and provide the community with the means to provide access to sports and sports facilities for everyone. In this regard, developed and industrial cities have a heavier duty to create

the facilities of the city and the region to answer the needs of the sports community (1).

Urban services are a means of urban development management and a major factor in the survival of a city without which the lives of citizens are in trouble. Its optimal distribution, in accordance with the people's will, is very important in the urban planning process (2). Today, the service sector plays an important role, and in advanced countries, the economy has shifted from products to services and has become

*. Corresponding Author:

Mohammadreza Esmailzadeh, Assistant Professor

E-mail: reza_ismaelzadeh@yahoo.com

one of the most important long-term trends in today's economic world and today these services are at the center of attention of organizations (3).

The existence of inequality and spatial imbalance in the inhabitants of different parts of a city is by no means a new phenomenon in any of the world's cities, but in developing countries, due to the significant social, economic and inequalities and the imbalance in services, the difference of the spatial extent of cities has been intensified (4). Because the spatial urban structure of a city is an array of elements that are interacting with each other, and the non-existence of each of these components will affect the entire structure (5).

Spatial inequalities are only justified when it is due to the improvement of public life. Researchers consider social and spatial justice in cities as a fair allocation of urban resources and facilities that can be directed in such a way that individuals with minimal disagreement and objections to their rights meet their demographic needs in different ways (6). Therefore, the balanced spatial organization in cities is a kind of urban sustainability that sustainability will be achieved when logical coordination and reconciliation between population distribution and distribution of services in cities are created. Sports facilities can be considered as one of the important components of urban life for the health of the community, in which functions such as the simultaneous presence and concentration of a large human population, mobility, spending leisure time and recreation in the large cities and metropolises, face-to-face communication, Sports competitions and games between groups are held, non-sports meetings and meetings are held for social and sometimes political purposes (7).

The acceptance of this principle that sustainable development requires the establishment of social and spatial justice in cities, eliminating social inequalities, and the vulnerability of low-income groups, the optimal distribution of services and facilities, and the consideration of the basic needs of citizens, adds to the importance of a sustainable development perspective (8).

The urbanization process of the world in the developing countries has been faced with the imbalances in services, population expansion and urban growth, so that the instability resulting from this uneven growth, in the form of social and spatial imbalances with urban poverty, and

informal employment, weakness of local sovereignty and biological contamination (9).

Distribution of services in cities has affected urban spatial distribution in urban areas, and as a result, the proper distribution of social, economic, cultural and health facilities, and sports and recreational facilities among regions and districts is one of the most important factors in preventing inequalities and the gap in the development and distribution of the appropriate space for the population in the Territory (1).

Urban sports facilities are the best place for renewal of physical and mental power for the citizens. Therefore, for sustainable urban development and providing the citizens with the optimum access to sports spaces, spatial distribution of sports venues, spatial and spatial fitness, and their optimal location through indicators and appropriate assessment methods are of great importance (10). Therefore, the distribution of sports spaces in the city and in different urban areas can have a favorable effect on the desired and effective city performance, as well as the appropriate variety and distribution of sporting activities, increase the power and choice of the sports spaces and therefore an increase in the desirability of living in the city (11).

The proper management and implementation of sports programs requires the provision of a set of facilities, among which the most important of these conditions are the creation and development as well as the exploitation of sports facilities and the provision of facilities for easy access of sports enthusiasts to these spaces. Therefore, proper location for the construction of sports facilities for the purpose of exploitation of sites is very important, and prevent to lack of proper use of places and the cost of spending in vain (12).

In this regard, Brown et al. (2014) concluded that sporting venues had a good urban distribution in the distribution of recreational and sports facilities, and there was a meaningful relationship between the optimal distribution and the level of sport participation (13).

In another study, Pamela (2013) in Munich, Germany, considered the standards of sports infrastructure and neighborhood with people's place of residence effective in developing sports participation (14). Also, Poggio et al (2012) considered the safety and quality of places and the routes of access and distribution of sports facilities to be effective in terms of people's

participation in sport and the efficiency of places (3).

Higgs et al. (2015) reported in their study that in Wales, people living in more deprived areas have more access to places and sports opportunities, and the results are remarkable (15). But in a study by Vandermeersch and Scheerder (2016), in the deprived areas, the condition of sports and sports facilities is undesirable and there is a need for the cooperation of sports managers and local authorities to develop sports in these areas (16). Pitts and Shapiro (2017) also emphasized the importance of equitable distribution of sports supplies for the sport of the disabled and its role in the development of sport tourism (1), and Kumar et al (2018) also considered sports participation to be dependent on the distribution of facilities, welfare and social capital (17). Fereydouni et al (2015) also showed that in Iran large provinces have more sporting events and more investment in sports by the private sector with higher levels of sports success and more facilities than population (18).

Bunds et al (2018) also emphasized the effect of the optimal distribution of sports facilities on youth sports (10).

The increasing tendency of the community to exercise indicates their understanding of the role of exercise in maintaining and improving the physical and mental health of humans. Regular participation of individuals in physical activity brings many physical, mental and emotional benefits and offers many opportunities for enjoying new experiences, enhancing skills, social interactions and goals associated with personal development for them, in terms of which the body will be more active and healthier (10). Therefore, optimal location and appropriate access to sports facilities are important, as studies show that the establishment and expansion of sports centers can increase the participation of people in activities and exercises at least 3 times a week, 52 percent. Therefore, in the sports industry, the fair distribution of sports services will lead to the use of sports equipment in all parts of the city (19).

Based on this, we decided to examine the distribution of these services and recreational activities in the field of sport and society by examining whether the distribution of services and recreational services is fair in the city of

Mashhad, and whether the distribution of these services is fair in the community level?

MATERIALS AND METHODS

The present research is a descriptive-analytical research, which is applied type that has been surveyed data collection. Participants: The statistical population of this research is the referrals of sports halls under the supervision of the Sports and Youth Organization of Mashhad, and Mashhad municipality and their total number is 25,000 and according to the Morgan table, 341 people were selected from the Sports and Youth Organization sport halls and 347 from the halls under the supervision of the municipality were selected as the statistical sample. Tools: The data gathering tool is a researcher-made questionnaire that measures fair distribution. The validity of the research tool was verified by ten sports management professors and its reliability was calculated by Cronbach's alpha of 0.785 and indicates a high reliability of the research tool.

Statistical Analysis: Topsis method was used to analyze the data. Topsis was developed as one of the classical compensatory methods in multi-criteria decision making to solve prioritizing issues based on the similarity to the ideal ideal solution by Huang and Yun. TOPSIS algorithm is a highly technical and robust decision-making method to prioritize options by simulating the ideal answer. The basis of this technique is that the choice option should have the least distance with the ideal solution (the best possible condition) and the maximum distance with the ideal solution (the worst possible condition). In this model, it is assumed that the utility of each indicator is uniformly incremental or decreasing (5).

Solving the problem with this method involves eight steps. These steps include the formation of data matrices, standardization of data, and the formation of a standard matrix, determining the weight of each indicator, determining the distance between the *i*-th alternative from the ideal alternative (the highest performance in each indicator), determining the *i*-th alternative minimum (lower) The most important function of each indicator is the determination of the gap criterion for ideal and minimum alternatives, the determination of a coefficient equal to the alternative spacing, at least dividing by the total

alranian distance and the ideal alternative distance, ranking of alternatives (20).

RESULTS

Regarding the results of Table 1, it shows that region 1 has ranked first, and region 6 has ranked the last in terms of per capita.

Regarding the results of Table 2, there is a significant difference in the level of development among physical education sports complexes, so that region 1 ranked first, and Zone 6 region the last.

According to the results of Table 3, it is seen that region 4 ranked first, and the 10region had the last positions.

According to the results of Table 4, region 4 has the first rank, and the region has the 10th last rank in terms of developmental level.

According to the results, Table 5 from all sports complexes, Region 1 ranked first, and region 6 ranked last. According to the results of Table 6 region 1 ranked first and region 6 ranked last in the city of Mashhad.

Table 1. Ranking the Distribution of Recreational Sports Services

Zone/Hall	Rank
1	
Takhti	0.9995
Sajjad	0.9924
Beheshti	0.9879
8	
Mehran	0.9798
9	
Abobargh	0.9778
10	
Kosar	0.9382
4	
Ghods	0.9330
5	
Jafari	0.8859
Golshahr	0.8855
6	
Rajayi	0.8226

Table 2. Study of the Difference in the Level of Development of Sports Facilities in Different Urban Areas

Zone/Hall	Rank
1	
Takhti	0.999633
Sajjad	0.99027
Beheshti	0.985688
8	
Mehran	0.983815
9	
Abobargh	0.981548
10	
Kosar	0.946582
4	
Ghods	0.940571
5	
Jafari	0.915168
Golshahr	0.90123
6	
Rajayi	0.83806

DISCUSSION

In this research, according to each section, the ranking of the areas first for sports complexes was given to the Sports and Youth Organization of Mashhad and then the municipality of Mashhad and finally to the whole. According to the results of the present study, it was found that there is a significant difference in sport per capita in different parts of the city of Mashhad, so that in the ranking using Topsis model, the first level region 1 and the 6 region last rank have been ranked. Also, there is a significant difference in the level of development among different regions, and therefore, it seems that in the future more precise and practical planning is needed to resolve this difference. Ranking of the areas using the Topsis model showed that area 1 is in terms of development level in the first rank and area 6 in terms of development level in the last rank.

Table 3. Assessment of the Balance of Distribution of Sports and Recreational Services according to the Expectations of the Referrals

Zone	Hall	Rank
4	Beheshti	0.972707
12	Araste	0.96486
3	Resalat	0.956264
4	Basij	0.949716
9	Delavaran	0.94538
3	Yas	0.94490
8	Namjoo	0.911641
9	Khaghani	0.90230
7	Babaghodrat	0.899026
10	Misagh	0.898392
4	Aramesh	0.89617
6	Ghadir	0.889985
4	Eram	0.886332
7	Samen	0.88443
12	Sorena	0.88434
2	Hejab	0.88307
6	Rajayi	0.882503
9	Vakilabad	0.875954
6	Nosrat	0.872704
11	Golsa	0.86566
2	Chodani	0.863105
3	Naseri	0.86182
9	Sayad Shirazi	0.858597275
12	Elahiye	0.852502
10	Rasti	0.83665

Table 4. Balance Analysis between Different Regions of the City Relative to each other, in Terms of Development Level of Municipalities

Zone	Hall	Rank
4	Behesht	0.966812
8	Namjoo	0.956145
12	Araste	0.953322
3	Resalat	0.946942
9	Delavaran	0.933079
4	Basij	0.926531
3	Yas	0.905276
7	Samen	0.891559
10	Misagh	0.887682
9	Khaghani	0.884086
6	Nosrat	0.874042
6	Ghadir	0.86366

Table 5. The Balance between Level and Percentage of Distribution of Sporting Services with Expectations of Visiting Mashhad Sports Complexes

Zone	Hall	Rank
1	Takhti	0.999506974
1	Sajjad	0.992406454
1	Beheshti	0.987948538
8	Mehran	0.979848586
9	Abobargh	0.977888091
12	Behesht	0.972707043
3	Araste	0.964862455
4	Basij	0.956264378
9	Delavaran	0.949715603
3	Yas	0.945380272
10	Kosar	0.944902512
4	Ghods	0.938272948
8	Namjoo	0.93309776
9	Khaghani	0.911640827
7	Babaghodrat	0.902301542
10	Misagh	0.899025988
4	Aramesh	0.898392165
6	Ghadir	0.896172803
4	Eram	0.889984529
5	Jafarian	0.886331841
5	Golshahr	0.885979252
7	Samen	0.885550163
12	Sorena	0.884429905
2	Hejab	0.884349019
6	Rajayi	0.883069671
9	Vakilabad	0.882503484
6	Nosrat	0.875954398
11	Golsa	0.872703988
2	Chodani	0.865665077
3	Naseri	0.863104875
9	Sayyadshirazi	0.861820752
12	Elahiye	0.858597275
10	Rasti	0.85250181
6	Rajayi	0.836650463

This suggests that differences between regions can affect the participation of some people who have limited access to places and, consequently, per capita sports participation, areas may be due to defective sports facilities and restricted sports facilities and recreation, experience more social problems than other areas. Brow et al (2014) showed that the distribution of places in Germany was favorable, and Higgs et al (2015) showed that in Wales, access to people in deprived areas was better for sports facilities, and Bunds et al (2018) emphasized fair distribution (10, 13, 15).

These findings are not consistent with the results of the research and show that, unlike developed countries and some developing countries, Mashhad did not have a satisfactory performance in terms of distribution of sports facilities. But it is consistent with the findings of Fereydouni et al (2015), and these scholars have demonstrated distributive injustice in sporting facilities among the provinces, which shows that justice in the distribution of sports facilities in our country is neither national nor at the level of cities and metropolises are not well-respected (18).

Table 6. Checking Balance and Balance between Different Areas of the City, considering the Level of Development of Sports Complexes

Zone	Hall	Rank
1	Takhti	0.999632937
1	Sajjad	0.990269757
1	Beheshti	0.985687526
8	Mehran	0.983815158
9	Abobargh	0.981547603
12	Behesht	0.966811726
3	Araste	0.95614455
4	Basij	0.953321885
9	Delavaran	0.946942313
3	Yas	0.946582446
10	Kosar	0.940570612
4	Ghods	0.933079292
8	Namjoo	0.92653113
9	Khaghani	0.915167597
7	Babaghodrat	0.905276159
10	Misagh	0.901229795
4	Aramesh	0.891559285
6	Ghadir	0.887681968
4	Eram	0.884085944
5	Jafarian	0.87404184
5	Golshahr	0.863660242
7	Samen	0.858374984
12	Sorena	0.857619566
2	Hejab	0.857533363
6	Rajayi	0.855842416
9	Vakilabad	0.855289365
6	Nosrat	0.855043585
11	Golsa	0.851284952
2	Chodani	0.850754957
3	Naseri	0.847051257
9	Sayyadshirazi	0.844602805
12	Elahiye	0.844036741
10	Rasti	0.840814552
6	Rajayi	0.836132234

Also, the per capita survey of Mashhad Municipality Sports Complexes shows a significant difference in terms of per capita and standard per capita, and the ranking of areas by using the Topsis model indicates that the 4th area was in terms of per capita in the first rank and 10th in terms of per capita are in the last rank. Comparing the sports facilities of the municipality with each other also reflects the degree to which the differences between sports complexes can be distinguished. Many areas have excellent facilities, sufficient trainer and service staff, while this distribution has not been carried out in some areas. Surveying the per capita amount of sports complexes in the whole city of Mashhad (physical education - municipality) and fair distribution of services according to the expectations of visitors from this hall in the city of Mashhad indicates that the pattern of distribution of sports space is not proportional to the population size of the city. Therefore, the need for proper and comprehensive planning in the location of sports spaces in Mashhad seems necessary. The lack of attention to sports per capita for urban areas, in spite of the participation

of sports people in the affected regions, has been effective in deficient urban planning in organizations in the sporting areas, including the municipality and the general administration of sport and youth. Also, due to financial problems in organizations such as the General Directorate of Sports and Youth and the Municipality, to develop sports facilities in these areas, it is necessary to attract the participation of the charities and the private sector, and to make facilities and development of the facilities fairly standard per capita sports per capita approaching the metropolis of Mashhad. Vandermeerschen and Scheerder (2016) also showed that the resources and facilities of sports facilities in both the private and public sectors in deprived areas are lower than in other regions and are consistent with the findings of the research (16). Pitts and Shapiro (2017) also emphasized for the development of sports facilities and equipping facilities especially equipment for the disabled (21). Considering the large number of tourists entering Mashhad, equipping places and fair distribution can be considered as an introduction to the development of sport tourism.

CONCLUSION

What was found out from the research findings was that in Mashhad, in addition to building places, regardless of the fair distribution of urban areas, facilities have also been unfairly distributed, and this issue in terms of the extent of

sport development in all urban areas has adverse effects. Therefore, the results of this study suggest that in order to develop and expand the city of Mashhad in the following years, it is urgently needed to properly decide and implement good and optimal urban projects and supervision in the manner of deployment of sporting activities in Mashhad, as well as their fair distribution in 13 areas of Mashhad city are necessary.

The most important limitation of this research was the difficulty of accessing of the facilities of the salons and the accurate assessment of the status of the equipments in the sports facilities. Therefore, it is recommended that research be more closely coordinated with municipal organizations and the General Directorate of Sports and Youth in order to provide more accurate evaluation of results.

APPLICABLE REMARKS

- The results of the research show that the deprived areas of Mashhad have weaker sports and recreational facilities. Therefore, fair investment is needed for the deprived areas of the city of Mashhad, especially the 5th and 6th areas. It is also necessary to upgrade the facilities in the sports halls of these urban areas. Also, with the presence of experienced coaches with appropriate equipment, will also enhanced the level of the quality of the existing salons in deprived areas.

REFERENCES

1. Hallmann K, Wicker P, Breuer C, Schüttoff U. Interdependency of sport supply and sport demand in German metropolitan and medium-sized municipalities – findings from multi-level analyses. *Eur J Sport Soc.* 2016;**8**(1-2):65-84. doi: [10.1080/16138171.2011.11687870](https://doi.org/10.1080/16138171.2011.11687870)
2. McGrath LJ, Hopkins WG, Hinckson EA. Associations of objectively measured built-environment attributes with youth moderate-vigorous physical activity: a systematic review and meta-analysis. *Sports Med.* 2015;**45**(6):841-865. doi: [10.1007/s40279-015-0301-3](https://doi.org/10.1007/s40279-015-0301-3) pmid: 25618013
3. Poggio L, Vrscaj B. A GIS-based human health risk assessment for urban green space planning--an example from Grugliasco (Italy). *Sci Total Environ.* 2009;**407**(23):5961-5970. doi: [10.1016/j.scitotenv.2009.08.026](https://doi.org/10.1016/j.scitotenv.2009.08.026) pmid: 19767058
4. Wolfslehner B, Vacik H, Lexer MJ. Application of the analytic network process in multi-criteria analysis of sustainable forest management. *Forest Ecol Manage.* 2005;**207**(1-2):157-170. doi: [10.1016/j.foreco.2004.10.025](https://doi.org/10.1016/j.foreco.2004.10.025)
5. Vidal R, Sánchez-Pantoja N. Method based on life cycle assessment and TOPSIS to integrate environmental award criteria into green public procurement. *Sustain Cities Soc.* 2019;**44**:465-474. doi: [10.1016/j.scs.2018.10.011](https://doi.org/10.1016/j.scs.2018.10.011)
6. Oh K, Jeong S. Assessing the spatial distribution of urban parks using GIS. *Landscape Urban Plan.* 2007;**82**(1-2):25-32.
7. Duc TT, editor Using GIS and AHP technique for land-use suitability analysis. International symposium on geoinformatics for spatial infrastructure development in earth and allied sciences; 2006: Citeseer.

8. Lin T-Y, Sakuno S. The Coming Super Aged Society: Exploring Management of Community Sport Clubs. 2015:31-46. doi: [10.1007/978-4-431-55324-3_3](https://doi.org/10.1007/978-4-431-55324-3_3)
9. Cleland V, Ball K, Hume C, Timperio A, King AC, Crawford D. Individual, social and environmental correlates of physical activity among women living in socioeconomically disadvantaged neighbourhoods. *Soc Sci Med.* 2010;**70**(12):2011-2018. doi: [10.1016/j.socscimed.2010.02.028](https://doi.org/10.1016/j.socscimed.2010.02.028) pmid: [20362380](https://pubmed.ncbi.nlm.nih.gov/20362380/)
10. Bunds KS, Kanters MA, Venditti RA, Rajagopalan N, Casper JM, Carlton TA. Organized youth sports and commuting behavior: The environmental impact of decentralized community sport facilities. *Transport Res Part D Transport Environ.* 2018;**65**:387-395. doi: [10.1016/j.trd.2018.08.017](https://doi.org/10.1016/j.trd.2018.08.017)
11. Kelly B, King L, Bauman AE, Baur LA, Macniven R, Chapman K, et al. Identifying important and feasible policies and actions for health at community sports clubs: a consensus-generating approach. *J Sci Med Sport.* 2014;**17**(1):61-66. doi: [10.1016/j.jsams.2013.02.011](https://doi.org/10.1016/j.jsams.2013.02.011) pmid: [23517759](https://pubmed.ncbi.nlm.nih.gov/23517759/)
12. Patrick ISC, Mahony DF, Petrosko JM. Distributive Justice in Intercollegiate Athletics: An Examination of Equality, Revenue Production, and Need. *J Sport Manage.* 2008;**22**(2):165-183. doi: [10.1123/jism.22.2.165](https://doi.org/10.1123/jism.22.2.165)
13. Brown G, Schebella MF, Weber D. Using participatory GIS to measure physical activity and urban park benefits. *Landscape Urban Plan.* 2014;**121**:34-44. doi: [10.1016/j.landurbplan.2013.09.006](https://doi.org/10.1016/j.landurbplan.2013.09.006)
14. Wicker P, Hallmann K, Breuer C. Analyzing the impact of sport infrastructure on sport participation using geo-coded data: Evidence from multi-level models. *Sport Manage Rev.* 2013;**16**(1):54-67. doi: [10.1016/j.smr.2012.05.001](https://doi.org/10.1016/j.smr.2012.05.001)
15. Higgs G, Langford M, Norman P. Accessibility to sport facilities in Wales: A GIS-based analysis of socio-economic variations in provision. *Geoforum.* 2015;**62**:105-120. doi: [10.1016/j.geoforum.2015.04.010](https://doi.org/10.1016/j.geoforum.2015.04.010)
16. Vandermeerschen H, Scheerder J. Sport managers' perspectives on poverty and sport: The role of local sport authorities. *Sport Manage Rev.* 2017;**20**(5):510-521. doi: [10.1016/j.smr.2017.02.002](https://doi.org/10.1016/j.smr.2017.02.002)
17. Kumar H, Manoli AE, Hodgkinson IR, Downward P. Sport participation: From policy, through facilities, to users' health, well-being, and social capital. *Sport Manage Rev.* 2018;**21**(5):549-562. doi: [10.1016/j.smr.2018.01.002](https://doi.org/10.1016/j.smr.2018.01.002)
18. Fereidouni HG, Foroughi B, Tajaddini R, Najdi Y. Sport facilities and sporting success in Iran: The Resource Curse Hypothesis. *J Pol Mod.* 2015;**37**(6):1005-1018. doi: [10.1016/j.jpolmod.2015.05.003](https://doi.org/10.1016/j.jpolmod.2015.05.003)
19. Seifried C, Clopton AW. An alternative view of public subsidy and sport facilities through social anchor theory. *City Cult Soc.* 2013;**4**(1):49-55. doi: [10.1016/j.ccs.2013.01.001](https://doi.org/10.1016/j.ccs.2013.01.001)
20. Behzadian M, Khanmohammadi Otaghsara S, Yazdani M, Ignatius J. A state-of-the-art survey of TOPSIS applications. *Exp Syst Appl.* 2012;**39**(17):13051-13069. doi: [10.1016/j.eswa.2012.05.056](https://doi.org/10.1016/j.eswa.2012.05.056)
21. Pitts BG, Shapiro DR. People with disabilities and sport: An exploration of topic inclusion in sport management. *J Hosp Leisure Sport Tourism Educ.* 2017;**21**:33-45. doi: [10.1016/j.jhlste.2017.06.003](https://doi.org/10.1016/j.jhlste.2017.06.003)