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#### Original research article

# THE INFLUENCE OF CYCLO-TOURISM ON HEALTH AND ECONOMIC DESTINATION DEVELOPMENT

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### Aleksandra Vujko, Miloš Dragosavac, Nina Kisin, Branka Maksimović

Novi Sad Business School, Novi Sad, Serbia

Abstract. The most important aims of this paper are to investigate the attitudes of respondents about Fruška Gora Mountain as a resource for the development of cycling tourism. Then, to present the impact of cycling on health and to show the economic effects of this development. In this study, in use was the research survey technique conducted in well-known cycling clubs in Novi Sad, as well as random sampling conducted among passers-by (the analysis was based on a sample of 276 respondents). The economic effects of the development of cycling tourism are presented through the tourist traffic in seven mountain huts. In processing the data obtained SPSS program (version 17.0) was in use. The Pearson Chi-Square Test was used to determine frequency deviation. In conclusion, Fruška Gora Mountain is a suitable area for the development of cycling tourism, thus confirming the initial hypothesis.

Key words: Tourism, Cycling, Health, Fruška Gora Mountain, Economic development

#### Introduction

Obesity, stress and hyperkinesis are the major causes of all known diseases in modern society (Vujko & Plavša, 2011). These triangular factors are the typical working conditions and environment of modern society (Vujko & Plavša, 2011; Vujko & Plavša, 2014; Penić, Dragosavac, Vujko &, Besermenji, 2016). By following this we can come to the conclusion that there are numerous reasons for the activation of sport and recreational tourism. Cyclotourism, in particular, is a shining example of good practice.

Cyclo-tourism has multiple effects on biochemical mechanisms. Experts assume that physical activity is the best medicine. According to Vujko & Plavša (2011), there are a number

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Corresponding author: Branka Maksimović

Novi Sad Business School, Vladimira Perića - Valtera 4, 21 000 Novi Sad, Serbia

Phone: +381 21 485 4000 • E-mail: branka.maksimovic.vps@gmail.com

of positive impacts that cycling can have on human health in the modern society: an effect on self-esteem, confidence, and many other positive images of ourselves and the world around us. It is scientifically proven that physical activity influences the increase of endorphins, substances that stimulate a good mood. Endorphins are a type of enzyme and neurotransmitters occurring in the hypothalamus. Studies have shown that endorphins, the products of nerve cells similar to morphine, can reduce the feeling of pain and stimulate a sense of euphoria (a condition that is compared with the feeling we have after making love, enjoying chocolate etc.) More precisely, physical activity creates feelingsthat are a mixture of euphoria and satisfaction (Vujko & Plavša, 2011).

Cyclo-tourists are searching for new destinations, and the advantage of this tourist behavior is in the regional development of the area, which accordingly needs to be adapted to bike tourism (Simonsen & Jorgenson, 1998; Ritchie & Hall, 1999; Hayward, 2001; Hudson, 2003; Weed & Bull, 2004; Torkildsen, 2005; Weed, 2008; Matthew, 2009; Vujko & Plavša, 2010; Vujko, 2012; Vujko & Plavša, 2014; Vujko & Gajić, 2014). Fruška Gora Mountain is one of the most attractive recreation landscapes for the largest emitting centers in our country, Novi Sad and Belgrade, stretching over a much broader area, By following its main route, East -West, 80 km inlength, this island type of low mountain (its highest peak is Crveni čot at just 539 m), Orlovac (512 m), Iriški venac (490 m) and others (Obradovic, 2006; Penić et al., 2016), Fruška Gora Mountain represents a mountain which is directed towards developing cycling tourism. Assuming that there exists an interest in this form of tourism on Fruška Gora Mountain, the authors investigated the actual percentage of tourist traffic, as well as the potentials of the mountain that can be crucial for the development of this type of tourist movement. In addition to this, the effects of cycling on human healthwere also examined. At the end of this paper, we present data on tourist traffic, along with certain assumptions for the economic development of the given area and the dispersion zone of the city of Novi Sad. In this regard, the primary objective of this research is to point out the possible effects of cycling on health and the economic effects of this development. The purpose of this work is to take advantage of the perceived opportunities so that they can be the starting point for the development of future, potential and concrete innovative projects that would elaborate the potential system of cross-border partnerships that would contribute to the economic and sustainable development, encourage entrepreneurship and increase the number of visitors to this destination (Hayward, 2001; Hudson, 2003; Weed 2008; Vujko, 2012, Vujko & Gajić, 2014). For the purpose of this research, we used the survey research technique, whereby out of the 300 distributed questionnaires, 276 were taken into consideration in the analysis. SPSS software, version 17.0, and Pearson's chi-square test were used in the analysis.

#### **METHOD**

This study is a combination of quantitative methods (questionnaires, statistics and analysis on the Internet) and qualitative methods (interviews, discussions and written documents). We used bibliographical-speculative method in the phase of defining the theoretical framework of the work, and during result processing a statistical method was used.

The first part of the work is a field survey and data collection through direct examination in three cycling clubs in Novi Sad (Vojvodina, Elit and Velo) and among the occasional passersby, while in the second part of the analysis, conclusions were drawn. The sample included 276

respondents divided into two groups: bikers and random passers-by. The study was conducted in the period May-October 2015. There were 78 cyclists, and 198 passers-by. They were interviewed in the streets of Novi Sad, as well as various locations in the area of Fruška Gora Mountain (Popovic, Andrevlje, Iriški Venac). Some of the questions were open, some close-ended. Variables were related to how often we ride a bike, whether the area of Fruška Gora Mountain is suitable for cycling and whether we would ride a bike more frequently if the driving paths were arranged and marked. Then, respondents were asked a set of questions concerning the effects of cycling on their health. Variables were related to how they feel after driving, do they feel that cycling affects their health and whether cycling affects their quality of life. This fieldwork provided an assessment of the current state of the direct economic impact of cycling tourism on Fruška Gora Mountain.

Analyses were carried out on the basis of the data obtained from the Statistical Office of the Republic of Serbia. However, due to the fact that in Serbia there is still no "single record of tourist traffic", the number of tourists and overnight stays in various facilities on Fruška Gora Mountain, current data are based on subjective assessments of current providers of sports and recreational services on the mountain, thus they do not reflect theactual state of affairs. Possible indirect impacts are based on the assumptions, and are in accordance with the examples of other communities. One of the methods of analysis of the data obtained was the Pearson Chi-Square Test. The Pearson Chi-Square test is a very practical test which is used to determine whether some obtained (observed) frequency (answers of the respondent cyclists compared to the answers of respondent passers-by) deviate from the frequencies that were expected. The test wanted to prove whether there is a connection between these two groups and the likelihood of this connection. In thi study it was assumed that there will be differences in the responses of cyclists compared to those of passers-by but in order to check this assumption (hypothesis), this test was applied.

The basic hypothesis which was the starting point in this work, starting from the fact that cycling tourism is becoming more and more popular type of tourism in the world (Matthew, 2009; Vujko & Gajic, 2014), was the assumption that Fruška Gora Mountain is an area where it is possible to develop cycling tourism. This would further imply positive effects in the field of tourism, the economy of the region and economyin general. Within this hypothesis, certain lower-level hypotheses were set: h1 - cycling has a positive effect on health; h2 - development of cycling tourism has a positive economic impact on the destination.

### RESULTS AND DISCUSSION

In order to obtain an answer to the given hypothesis that Fruška Gora Mountain is an area suitable for the development of cyclo-tourism, first we present the results obtained by processing the data provided by the respondents and passers-by, in order to detect differences in the responses measured on the basis of statistically significant differences in the distribution of the dependent variable with respect to independent variable. Statistically significant differences were set at the level of p<0.05. Although in the analysis there were more passers-by (68.1%), a more significant discrepancy is observed only in two questions. Cyclists drove significantly more vehicles in the mountains (because they do not require a marked cycle track), in comparison to the occasional passers-by, so that in the event of planning and arranging tracks, they would actually only increase the intensity of driving vehicles. Also, the data which from

the start showed good potential for the development of cycling tourism was that only 1% of the passers-by do not, or rarely, ride a bicycle.

|                       | I ride a bicycle |                 |                  |                                |       |
|-----------------------|------------------|-----------------|------------------|--------------------------------|-------|
|                       | Every day        | At the weekends | When I have time | I do not ride a bicycle at all |       |
| Cyclist               | 76               | 2               | 0                | 0                              | 78    |
|                       | 27.5%            | 0.7%            | 0%               | 0%                             | 28.3% |
| Occasional passers-by | 89               | 95              | 12               | 2                              | 198   |
| -                     | 32.2%            | 34.4%           | 4.3%             | 0.7%                           | 71.7% |
| Total                 | 165              | 97              | 12               | 2                              | 276   |
|                       | 59.8%            | 35.1%           | 4.3%             | 0.7%                           | 100%  |

**Table 1** The time that the respondents spent riding a bicycle

Table 1 shows that almost all the respondents ride a bicycle, but a certain number of them (39,4%) "sometimes" ride a bicycle, while a very small number of respondents, only 2(0,7%) out of the total number of respondents, do not ride a bicycle at all.

Table 2 The Pearson Chi-Square test

|                 | Value  | df | Statistical significance (p) |
|-----------------|--------|----|------------------------------|
| Chi-Square test | 64.140 | 3  | .000                         |

Based on the obtained values: p = .000, a statistically significant difference is observed in the responses of cyclists and occasional passers-by (Table 2). The second group of analyzed variables was related to attitudes about cycling on Fruška Gora Mountain. It was necessary to check whether in the current conditions some of the respondents ride a bike in the mountains and who these participants are.

Table 3 Respondents' attitudes on cycling on Fruška Gora Mountain

|                      | Have you ever ridden a bike on Fruška Gora Mountain? |       | Total    |
|----------------------|--|-------|----------|
|                      | Yes  | No    | <u> </u> |
| Cyclist              | 78   | 0     | 78       |
|                      | 28.3%  | 0%    | 28.3%    |
| Occasional passer-by | 126  | 72    | 198      |
| •                    | 45.7%  | 26.1% | 71.7%    |
| Total                | 204  | 72    | 276      |
|                      | 73.9%  | 26.1% | 100%     |

By looking at Table 3, we can see that there is a discrepancy in the responses of cyclists and passers-by. Namely, all the tested cyclists (28.3%) answered "yes" to the given question, while with the occasional passers-by (45.7%) there was a higher percentage of those who answered "yes", but also there were those who answered that they have never ridden a bike on the mountain (26.1%).

Table 4 The Pearson Chi-Square test

|                 | Value  | df | Statistical significance (p) |
|-----------------|--------|----|------------------------------|
| Chi-Square test | 38.374 | 1  | 0.000                        |

Based on the obtained value: p = .000 a statistically significant difference is observed in the responses of cyclists and occasional passers-by (Table 4). A group of variables which confirmed the initial hypothesis is shown in Table 5 and the question posed to the respondents regarding the benefits of Fruška Gora Mountain as a destination for cycling tourism. Thus, the responses of the respondents (73.9%) that the mountain is suitable for cycling, confirmed the initial hypothesis H that Fruška Gora Mountain is an area where it is possible to develop cycling tourism.

Table 5. Respondents' attitudes on the suitability of the mountain for cycling

|                      | Is Fru | Total |            |             |
|----------------------|--------|-------|------------|-------------|
|                      | Yes    | No    | Don't know | <del></del> |
| Cyclist              | 78     | 0     | 0          | 78          |
|                      | 28.3%  | 0%    | 0%         | 28.3%       |
| Occasional passer-by | 126    | 2     | 70         | 198         |
|                      | 45.7%  | 0.7%  | 25.4%      | 71.7%       |
|                      | 204    | 2     | 70         | 276         |
| Total                | 73.9%  | 0.7%  | 25.4%      | 100%        |

It is interesting that the majority of the respondents (73.9%) responded to this question with "yes", which is a sufficient indicator of the positive attitudes of the citizens of Novi Sad on the potentials that the mountain has for developing this sport and recreational tourism.

Table 6 The Pearson Chi-Square test

|                 | Value  | df | Statistical significance (p) |
|-----------------|--------|----|------------------------------|
| Chi-Square test | 38,374 | 2  | .000                         |

Based on the obtained value: p = .000 a statistically significant difference is observed in the responses of the cyclists and occasional passers-by (Table 6). Encouraging data regarding the development of cycling tourism on Fruška Gora Mountain have been obtained in the analysis of a group of variables that were related to the period of time that the respondents spent in cycling in the mountains. It is particularly interesting that a large number of the respondents occasionally rode a bicycle which actually reflects the true function of Fruška Gora Mountain, which is undoubtedly of an excursion character (Table 7).

**Table 7** Respondents' attitudes to riding a bicycle on Fruška Gora Mountain and the length of the rid

|                      | If the tracks were arranged and marked, and if there was appropriate transport for bicycles and equipment, how often would you ride a bicycle on Fruška Gora Mountain? |                 |                  |                                   |       |
|----------------------|--|-----------------|------------------|-----------------------------------|-------|
|                      | Every day  | At the weekends | When I have time | I do not ride a bicycle<br>at all |       |
| Cyclist              | 76   | 0               | 2                | 0                                 | 78    |
|                      | 27.5%  | 0%              | 0.7%             | 0%                                | 28.3% |
| Occasional passer-by | 71   | 51              | 74               | 2                                 | 198   |
|                      | 25.7%  | 18.5%           | 26.8%            | 0.7%                              | 71.7% |
| Total                | 147  | 51              | 76               | 2                                 | 276   |
|                      | 53.3%  | 18.5%           | 27.5%            | 0.7%                              | 100%  |

Based on the obtained value p=.000 we can observe a statistically significant difference in the responses of the cyclists and occasional passers-by (Table 8).

Table 8 The Pearson Chi-Square test

|                 | Value  | df | Statistical significance (p) |
|-----------------|--------|----|------------------------------|
| Chi-Square test | 85.339 | 3  | .000                         |

According to Dondur (2016), there are significant differences in the health status of people from urban and rural areas, especially in developing countries. The urban way of life leaves the individual no time to devote to serious improvement of their physical or mental health. This is a problem that modern society faces and needs to be resolved in an appropriate manner (Dondur, 2016). The respondents in most cases (96.4%) answered that they have the impression that cycling has a positive effect on their health and that riding a bicycle makes them feel healthier. By looking at Table 10 it can be concluded that there is no statistically significant difference in the answers of the respondents, indeed that both groups of respondents have similar opinions.

Table 9 Respondents' attitudes on the impact of cycling on health

|                      | Do you have the | Do you have the impression that cycling makes you feel healthier? |              |       |  |  |
|----------------------|-----------------|---|--------------|-------|--|--|
|                      | Yes             | No  | Cannot judge |       |  |  |
| Cyclist              | 78              | 0   | 0            | 78    |  |  |
|                      | 28.3%           | 0%  | 0%           | 28.3% |  |  |
| Occasional passer-by | 188             | 8   | 2            | 198   |  |  |
|                      | 68.1%           | 2.9%  | 0.7%         | 71.7% |  |  |
| Total                | 266             | 8   | 2            | 276   |  |  |
|                      | 96.4%           | 2.9%  | 0.7%         | 100%  |  |  |

Table 10 The Pearson Chi-Square test

|                 | Value | df | Statistical significance (p) |
|-----------------|-------|----|------------------------------|
| Chi-Square test | 4.087 | 2  | .130                         |

Table 11 shows more precisely the views of the respondents on the impact of cycling on their lives. The largest number of respondents-cyclists (N=63) responded that they ride bicycles to participate and win the race. This is a logical assumption, because the research included cyclists who are members of cycling clubs. However, a number of them responded that they ride a bike because it relaxes them and because they enjoy the company of other people (N=13). As for occasional passers-by, the situation was quite different. Most of them (N=74) responded that they ride a bike because it makes themfeel and look better, therefore healthier and more fulfilled, while other responses were equally present. Bearing this in mind, it is clearthat statistical differences were observed in the responses (Table 12). Data from Tables 9, 10, 11 and 12 confirmed the sub-hypothesis *h1* - that cycling has a positive impact on health.

Table 11 Respondents' attitudes to the impact of cycling on everyday life

| How does cycling affect your everyday life?          | Cyclist | Occasional passer-by | Total |
|--|---------|----------------------|-------|
| I look better because of doing this activity.        | 2       | 74                   | 76    |
|  | 0.7%    | 26.8%                | 27.5% |
| I am happier because of spending time in nature.     | 0       | 43                   | 43    |
|  | 0%      | 15.6%                | 15.6% |
| I have more strength and energy to deal with stress  | 0       | 27                   | 27    |
| at work and at home.                                 | 0%      | 9.8%                 | 9.8%  |
| A bike is cheaper and healthier mode of transport.   | 0       | 42                   | 42    |
| •  | 0%      | 15.2%                | 15.2% |
| I always drive in company so I enjoy having fun and  | 13      | 10                   | 23    |
| it relaxes me.                                       | 4.7%    | 3.6%                 | 8.3%  |
| I am working on improving myself and I train so that | 63      | 0                    | 63    |
| I can participate in and win the race.               | 22.8%   | 0%                   | 22.8% |
| I do not have an opinion.                            | 0       | 2                    | 2     |
| •  | 0%      | 0.7%                 | 0.7%  |
| Total  | 78      | 198                  | 276   |
|  | 28.3%   | 71.7%                | 100%  |

Table 12 The Pearson Chi-Square test

|                 | Value   | df | Statistical significance (p) |
|-----------------|---------|----|------------------------------|
| Chi-Square test | 238.516 | 6  | .000                         |

Having in mind the potential of Fruška Gora Mountain, when sports and recreational tourism are concerned, it was necessary to do an inventory of all the relevant elements that comprisethe internal tourism potential of that area, and which could contribute to a better and longer stay of sports and recreational tourists. The field research resulted in the production of the basic elements of an inventory of the area. Fruška Gora Mountain is according to the 2022 Spatial plan for special purpose of Fruška Gora Mountain on the basis of hierarchization potential for sports and recreational tourism, zoned into four distinctive zones, within which the most typical tourist locationswere singled out, depending on the potential purpose.

**Table 13** Potential tourist sports and recreational localities on Fruška Gora Mountain by zone until 2022

| Zone     | Locality                               | Locality purpose                 |  |
|----------|--|----------------------------------|--|
| Zone I   | Stražilovo, Čortanovci, Međeš Lake,    | Centers of sports                |  |
|          | Iriški venac                           | and recreational tourism         |  |
|          | Stari Slankamen, Neštin                | Spa, health and wellness         |  |
|          |  | tourism and bathing              |  |
| Zone II  | Vrdnik, Zmajevac, Sremska Kamenica,    | Centers of sports                |  |
|          | Popovica, Glavica, Osovlje             | and recreational tourism         |  |
|          | "Norcev", Zmajevac, Popovica           | Sports and recreation center for |  |
|          |  | special groups and activities    |  |
| Zone III | Testera, Andrevlje, Koruška            | Centers of sports and            |  |
|          |  | recreational tourism             |  |
|          | Testera, Andrevlje, Brankovac, Ležimir | Centers of sports and            |  |
|          |  | recreational tourism             |  |
| Zone IV  | Bruja, Moharač, Sot, Vorovo            | Centers of sports and            |  |
|          |  | recreational tourism             |  |
|          | Sot, Kulina, Moharač, Vorovo           | Swim, spa locality, fishing and  |  |
|          |  | hunting tourism locality         |  |

Source: Spatial plan for special purpose of Fruška Gora Mountain, 2003.

Thus, it is proved that there an interest in cycling on Fruška Gora Mountain exists. Also, by examining Table 13, we can conclude that there are certain steps in the process of activation of sports and recreational tourism on the mountain. The next step that has to be implemented in the current work is the view of direct economic impact that cycling has on Fruška Gora Mountain. These impacts are initially reflected through the monitoring and recording of sports and recreational tourists –the tourist trade.

For the purpose of this work, research has been done on the average consumption of individual cyclists on Fruška Gora Mountain. However, due to the fact that there is no official information on tourist spending on Fruška Gora Mountain, it is important to point out that data are collected on the basis of a subjective evaluation, in mountain lodges in which the most frequent guests were hikers and cyclists (Table 14).

**Table 14** Average fuel consumption in dinars per recreational tourist in mountain lodges on Fruška Gora Mountain in 2015

| Mountain lodges | Food and drink | Stay | Total |
|-----------------|----------------|------|-------|
| "Kozarica"      | 200            | 200  | 400   |
| "Stražilovo"    | 150            | 600  | 750   |
| "Zanatlija"     | 250            | 200  | 450   |
| "Železničar"    | 300            | 250  | 550   |
| "Orlovac"       | 100            | 150  | 250   |
| "Penzioner"     | 100            | 200  | 300   |
| "Zmajevac"      | 160            | 1200 | 1360  |

Source: Authors' research

In 2017 a mountainbike marathon will be held on Fruška Gora Mountain for the 25<sup>th</sup> time. The data indicate that about 400 participants from Serbia and the region attended

last year's marathon, which places this event among the most important events when it comes to mountain biking in Serbia. However, in addition to direct economic impact, developed cycling tourism would have numerous indirect impacts. Using the help of networking, the space by the system of bicycle paths would bring several benefits and changes. First of all, it would represent the link of development for many other forms of sports and recreational activities (bathing tourism, visits to sites within the track, and therefore direct development of cultural, events, wine, and other forms of tourism). This extension of the offer would affect the regulation of vacation space and provide sanitation and catering services which would enable the opening of many jobs and result in creating benefits for the local population.

The expected benefitof this system of bicycle paths would be reflected in the usage of these paths for other, complementary types of tourism (mountaineering, horseback riding, carriage rides). Then, networking would mean the continuous development of the whole area (with a particular importance placed on connections with Croatia and developing and sustaining mountain biking by building Fruška Gora Mountain bike trails as well as bike trails in the Vukovar-Srijem and Osijek-Baranja County). Connecting to a network of bicycle paths (Croatia, Slovenia, Hungary, Austria) would result in a European cycling transversal which would be able to produce many other tourism products (Barnett, 2004; Vujko & Plavša, 2010; Vujko, Plavša &, Ostojić, 2013; Vujko & Gajic, 2014). With this a h2 sub-hypotheses is validated - that the development of cycling tourism has a positive economic impact on the destination.

#### **CONCLUSION**

The development of sports and recreational tourism on Fruška Gora Mountain would have long-term positive economic effects that would greatly contribute to the revival of the surrounding rural areas and accelerate the economic development of the city of Novi Sad. Sports and recreation tourists are not only free passers-by, they enjoy the experience offered and are always happy to return to the place where all their needs were met. The benefits of developing sports and recreational tourism would bemore far-reaching than it currently seems, but the natural and cultural resources would equally develop(Standeven & Knop, 1999; Cutumisu & Cottrell, 2004; Vujko, 2012).

First of all, it would represent the link of development of Fruška Gora as a sports and recreational resource, but also its dispersion zone. Given that tourism development can be viewed as a planned, conscious and continuous activity, the development of Fruška Gora for cycling tourism would be nothing more than directing the spatial distribution of tourism-relevant investment or corresponding spatial structures in which or by which cycling on Fruška Gora Mountain would take place and develop. Having all this in mind, perhaps we could agree that the modern development of tourism in general is approaching economic and social planning, although neither one nor the other are an easy task and require continuous research and perseverance. If the development of cycling tourism on Fruška Gora Mountain would not develop in accordance with the laws and standards of environmental protection, all the above-mentioned would not give good results.

The current level of development of cycling infrastructure networks, sports and recreational activities on Fruška Gora Mountain, generally speaking, is not in accordance

with the possibilities this excursion mountain possesses and which itcan provide. The existing programs and facilities do not have offer cycling, and the other recreational facilities are quite scarce. Unfortunately, this leads to the conclusion that generally speaking, the current promotion of recreation facilities of Fruška gora is not sufficiently represented, and that cycling tourism is scarcely present. In order to change the current state of Fruška Gora, we come to the main conclusion of this work, that is, the necessity of an appropriate plan for the development of any form of tourism, including bike tourism and in coordination with ecology, environmental protection, and marketing as a means of achieving the objectives that would be able to fulfill the expectations of both naturalists and tourists.

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# UTICAJ CIKLO-TURIZMA NA RAZVOJ ZDRAVSTVENIH I EKONOMSKIH DESTINACIJA

Najvažniji ciljevi ovog rada su istraživanje stavova ispitanika o planini Fruška Gora, kao resursa za razvoj biciklističkog turizma. Zatim, predstavljanje uticaja bicikla na zdravlje i ekonomske uticaje ovog razvoja. U ovoj studiji korišćena je tehnika istraživanja već sprovedena u poznatim biciklističkim klubovima u Novom Sadu, kao i slučajno uzorkovanje sprovedeno među prolaznicima (analiza je zasnovana na uzorku od 276 ispitanika). Ekonomski uticaji razvoja biciklističkog turizma predstavljeni su kroz turistički saobraćaj u sedam planinskih koliba. Za obradu podataka korišćen je program SPSS (verzija 17.0). Pirsonov Hi Kvadrat Test korišćen je za određivanje devijacije frekvencije. U zaključku Fruška gora predstavlja pogodnu oblast za razvoj biciklističkog turizma, čime se potvrđuje inicijalna hipoteza.

Ključne reči: Turizam, biciklizam, zdravlje, Fruška gora, Ekonomski razvoj