

SKIING TOURIST ACTIVITY IN POLISH FORESTS

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Abstract: The aim of the research was to determine the frequency, motifs and barriers to practicing the hiking ski tourism in Polish forests. Recreational activity in this respect was analyzed in terms of the occupational status of Poles. The research used an original questionnaire carried out among 900 Poles practicing hiking ski tourism, among which 859 respondents were taken into account in statistical calculations after verification. Physically working Poles and freelancers most often use hiking ski tourism in Polish forests. The most important motives for practicing this activity are: contact with nature, clean air, taking care of physical condition, relaxation and taking care of mental health. The largest barriers are: expensive ski equipment, lack of snow, lack of free time, few ski trails, unfavorable weather conditions, short daylight, large distance to the trail, insufficient infrastructure on the forest ski trails and lack of organized forms of hiking ski tourism.

Tourist routes and trails are an important place for skiing tourism for Poles due to the proper microclimate, clean air and contact with nature.

Keywords: skiing, Poles, forest environment, recreation, sport.

INTRODUCTION

Hiker skiing is not a typical model of spending the free time by Poles, and winter sports are still largely a niche in Poland (Bebeka 2016). This is mainly due to the fact that Poland, despite being one of the lowland countries with an average height of 169 m a.s.l., the winter season is too short (Nowacki, Kasperczyk 2001). The snow cover necessary for snow skiing lasts on average only for about 2-3 months a year, although in recent years, it lasts much shorter (Nowicki, Kasperczyk 2001). Snow cover has similar thickness both in the forest and outside, but it stays in the forest 1-2 weeks longer. This is one of the reasons why skiers prefer forest areas for this type of recreation (Mandziuk, Janeczko 2009). Skiing is important for both hardening and comprehensive motor development (Milleer 1991; Stróżecki 1991; Mandziuk, Janeczko 2009). It also increases the fitness and physical condition, as it promotes the development of fitness not only of the lower, but also of the upper body (Mruk-Tomaczak 2014). Working with poles and skis means that the skier uses a “four-legged” walk, which rhythmically engages the muscles of the whole body (Dorocki 2016). In addition, this tourism has a beneficial effect on the brain, as it improves its efficiency, promotes the formation of new cells and increases cognitive abilities at any age (Brain 2010). In addition, specific microclimate of the forest makes skiers improve their oxygen supply to the lungs and a soothing effect on the decrease in mental tension (Mazurek-Kusiak, Soroka 2021). The clean forest air promotes good condition of the respiratory system (Netherer, Schopf 2010). Being in the natural forest environment stimulates the immune system, which in turn causes better functioning of the nervous system (Rolfe, Windle 2015; Mazurek-Kusiak 2018). Immunity to all kinds of infections increases along with the resistance to depression (Brian 2010). Therefore, ski tourism in forests is the healthiest and most recommended form of winter physical activity (Dudek 2016) and has a positive effect on the human body (Klimek 2010). In addition, practicing the ski tourism in the forests makes it possible to explore interesting natural, cultural and historical regions and corners, and communing with nature provides many aesthetic experiences related to the beauty of a winter landscape (Sadowski 2003).

Ski tourism is an optimal form of leisure time management in the winter, and its development is influenced by the number and quality of elements of the tourist base, efficient communication, extensive tourist information and access to appropriate ski equipment (Gilbert, Hudson 2000).

The aim of the research was to determine the frequency, motives and barriers of practicing the hiker skiing tourism in Polish forests. It is important knowledge in order to create optimal conditions for practicing ski tourism,

improve tourist infrastructure in forests and promote skiing activity. Recreational activity in the above regard was analyzed in terms of the professional status of Poles.

PURPOSE, MATERIAL AND RESEARCH METHODS

The research used a proprietary survey, which was conducted among 900 Poles practicing hiker skiing, of which 859 was used for statistical calculations. The form consisted of two blocks of questions—the first concerned the frequency, reasons, and barriers to activity skiing tourism. The second was the questions enabling the characteristics of the respondents (sex, profession, age, type of place of residence). A five-point Likert scale was used to measure attitudes (where 1 = low importance for consumer and 5 = high importance for consumer). The survey questionnaire is presented in Table 1.

Table 1. Questionnaire for skiing tourist

You are kindly requested to fill in this questionnaire, which serves the purpose of researching the development of the ski tourism in Poland. It is anonymous and serves only scientific purposes. We are grateful for honest and precise completion of the form.

- 1. How often do you go skiing in forests?
 - I don't use it
 - very rarely
 - rarely
 - often
 - very often
- 2. Who do you do ski tourism with?
 - family
 - work colleagues
 - friends
 - club members
 - alone

3. Your motives for activity skiing: 1 – not important 5 – very important

| Specification | Grade | | | | |
|--------------------------------------|-------|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| contact with nature | | | | | |
| caring for mental health | | | | | |
| relaxation | | | | | |
| caring for physical condition | | | | | |
| the beauty of landscapes | | | | | |
| fromstressing | | | | | |
| spending time with your own children | | | | | |
| clean air | | | | | |

4. Your barriers of activity skiing: 1 – not important 5 – very important

| Specification | Grade | | | | |
|--|-------|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| lack of organized forms of ski tourism | | | | | |
| too expensive equipment | | | | | |
| time shortage | | | | | |
| too few ski trails | | | | | |
| insufficient infrastructure of ski routes | | | | | |
| unfavourable weather conditions (humidity, wind) | | | | | |
| too short day | | | | | |
| too long distance to the trail | | | | | |
| lack of snow | | | | | |

- 5. Your sex
 - female
 - male
- 6. Your occupational status
 - white collar worker
 - manual worker
 - own business
 - freelancer
 - manager/director/president
 - student/pupil
- 7. Your Age
 - from 20 to 34 years
 - from 35 to 49 years
 - from 50 to 65 years
 - 65 years or over
- 8. Your place of residence
 - village
 - town <20.000
 - city =>20.000

Source: Own study

At the stage of the sampling procedure, random selection was applied using the stratified sample. The population was divided taking into account the occupational status.

The Statistica 13.1 PL software was used for statistical calculations. In order to determine which variables distinguish six emerging groups, a discriminant function analysis was applied, because it allows to study differences between groups of objects based on a set of selected independent variables (predictors). In addition, it is used in correlation studies, i.e. when causal relationships between variables are not well recognized. The study used a classification function in the form of calculating coefficients that were determined for each group of variables. The chi-square test was also used to present differences in individual groups. Mean differences, in which the probability of randomness was less than 0.05, were considered statistically significant.

RESULTS

Statistically significant differences ($p = 0.0004$) in the frequency of practicing hiker skiing tourism in winter forests occur depending on the professional status of respondents (table 2).

Table 2. Frequency of lowland ski tourism in the Polish forests depending on occupational status

| Specification | Size test | I don't use it | very rarely | rarely | often | very often |
|----------------------------|--------------|---|-------------|--------|-------|------------|
| data in% | | | | | | |
| Occupational status | N=859 | Chi-square test=50.24062; p=0.0004 | | | | |
| white collar worker | 108 | 4.63 | 13.89 | 25.93 | 18.52 | 37.04 |
| manual worker | 180 | 2.78 | 2.78 | 10.00 | 20.00 | 64.44 |
| own business | 108 | 2.78 | 6.48 | 16.67 | 29.63 | 44.44 |
| freelancer | 82 | 1.22 | 2.44 | 13.41 | 32.93 | 50.00 |
| manager/director/president | 32 | 0.00 | 6.25 | 15.63 | 37.50 | 40.63 |
| student/pupil | 349 | 3.15 | 4.30 | 17.48 | 27.79 | 47.28 |

Source: Own study based on the research

This activity is most often used by skiers (table 2), who are physically working people (64.44% of indications - very often) and people practicing their profession (50.00% of indications - very often). Not much less (44.44%) skiers running their own business very often use the ski recreation in the forests. However, they do not use ski slopes in the woods of skiers who do mental work(4.63%), 3.15% who are pupils and students, 2.78% of each physically employed and self-employed and 1.22% of those doing freelance.

The choices of companions during skiing trips to the forest also differed significantly ($p < 0.0001$; $\chi^2 = 100.9054$) due to their professional status (table 3). Most, as much as 59.22% of the mentally employed, use the skiing recreation together with family members and then with friends (32.04%). This professional group goes on a skiing trip to the forest with work colleagues the least rarely (only 0.97%) and alone (1.94%). The situation is similar in the case of people working physically - 56.00% of people go skiing with family, and 29.14% with friends.

This professional group, however, more often chooses their work colleagues (7.43%) for the ski trip to the forest than members of the ski group (2.86%). Entrepreneurs and freelancers usually go skiing with their family members (46.67% and 45.68%, respectively) and with friends (23.81% and 35.80%, respectively). Companions for ski recreation for managers, directors and CEOs are friends (40.63%), family (31.25%) and work colleagues (15.63%). Pupils and students also most often choose the company of friends (57.99%) and family (32.25%).

Table 3. Who is used for hiking ski tourism in the forests according to occupational status

| Specification | test size | data in% | | | | |
|----------------------------|-----------|-------------------------------------|----------------------|--------------|-------------------|-------|
| | | With family | With work colleagues | With friends | With club members | Alone |
| Occupational status | N=834 | Chi-square test=100.9054; p<0.00001 | | | | |
| White collar worker | 103 | 59.22 | 0.97 | 32.04 | 5.83 | 1.94 |
| Manual worker | 175 | 56.00 | 7.43 | 29.14 | 2.86 | 4.57 |
| Own business | 105 | 46.67 | 10.48 | 23.81 | 9.52 | 9.52 |
| Freelancer | 81 | 45.68 | 7.41 | 35.80 | 3.70 | 7.41 |
| Manager/director/president | 32 | 31.25 | 15.63 | 40.63 | 3.13 | 9.38 |
| Student/pupil | 332 | 32.25 | 3.85 | 57.99 | 2.96 | 2.96 |

Source: Own study based on the research

In the following stage, the research concerned the motives for practicing the hiker skiing tourism in Polish forests, taking into account professional status of respondents (table 4). Six of eight motifs entered the model, which are the main focus of respondents. Statistically significant discriminatory differences in the studied groups from the largest to the smallest are: contact with nature (F = 7.325; p < 0.001), clean air (F = 5.879; p < 0.001), taking care of physical condition (F = 4.639; p < 0.001); relaxation (F = 4.580; p < 0.001), de-stressing (F = 4.267; p = 0.001), caring for mental health (F = 3.317; p = 0.006). The model did not qualify for the motives: spending time with your own children (F = 2.162; p = 0.056) and the beauty of landscapes (F = 1.463).

Table 4. Model of discriminant analysis - motives of hiking ski tourism in Polish forests depending on occupational status

| Factor | Model of discriminant analysis: λWilksa: 0.7507; F(40.3564)=6.0576; p<0.0001 | | |
|--------------------------------------|---|-------|--------|
| | λ Wilksa | F | p |
| Contact with nature | 0.784 | 7.325 | <0.001 |
| Caring for mental health | 0.766 | 3.317 | 0.006 |
| Relaxation | 0.772 | 4.580 | <0.001 |
| Caring for physical condition | 0.772 | 4.639 | <0.001 |
| The beauty of landscapes | 0.757 | 1.463 | 0.199 |
| Fromstressing | 0.770 | 4.267 | 0.001 |
| Spending time with your own children | 0.761 | 2.162 | 0.056 |
| Clean Air | 0.778 | 5.879 | <0.001 |

Source: Own study based on the research

The classification function reached the highest values with the motive: contact with nature, due to which the nervous system regains balance (table 5). This factor is most important for people who are physically employed (3.153) and entrepreneurs running their own business (3.033). Practicing hiker skiing tourism in the forests due to caring

for their physical condition is the most important in the case of mentally working people; the classification function was 2.337. The de-stress motive appeals most to entrepreneurs (1.610) and to independent professionals (1.612). The classification function reached slightly lower level in these two professional groups in the case of the mental health care motive and amounted to 1.438 and 1.417, respectively. While practicing the ski tourism, relaxation is the most important for freelancers (1.207), and clean air for pupils and students (0.654).

Table 5. Classification function - motives of hiking ski tourism in Polish forests depending on occupational status

| Factor | Classification function | | | | | |
|--------------------------------------|-------------------------|--------------|--------------|--------------|--------------|--------------|
| | A p=0.124 | B p=0.211 | C p=0.123 | D p=0.098 | E p=0.039 | F p=0.406 |
| Contact with nature | 2.760 | 3.153 | 3.033 | 2.866 | 2.905 | 2.617 |
| Caring for mental health | 1.107 | 1.361 | 1.438 | 1.417 | 1.700 | 1.130 |
| Relaxation | 1.097 | 0.798 | 1.300 | 1.207 | 0.955 | 1.221 |
| Caring for physical condition | 2.337 | 1.640 | 1.962 | 2.284 | 1.956 | 2.173 |
| The beauty of landscapes | 0.884 | 1.157 | 1.159 | 0.978 | 1.376 | 1.000 |
| Fromstressing | 1.362 | 1.091 | 1.610 | 1.612 | 1.013 | 1.350 |
| Spending time with your own children | 0.445 | 0.445 | 0.418 | 0.447 | 0.518 | 0.674 |
| Clean Air | 0.301 | 0.466 | 0.603 | 0.907 | 0.426 | 0.654 |
| Constant | -22.609 | -21.242 | -27.233 | -27.986 | -25.859 | -22.877 |

Legend: A – white collar worker; B - manual worker; C - own business; D - freelancer; E - manager/director/president; F - student/pupil

Source: Own study based on the research

Then, tourists were asked about barriers to practicing the hiker skiing tourism in Polish forests (table 6). Nine barriers have entered the model, which respondents pay attention to. Statistically significant effects of individual discriminating factors, from the largest to the smallest are: too expensive equipment necessary for practicing the tourism in question (F = 10.064; p < 0.001), no snow on most days of the year (F = 8.842; p < 0.001), lack of respondents' time (F = 8.471; p < 0.001), too few ski trails (F = 5.232; p < 0.001), adverse weather conditions (humidity, wind) (F = 3.887; p = 0.015), too short day (F = 3.331; p = 0.006), too large distance to the trail (F = 3.161; p = 0.008), insufficient infrastructure on forest ski trails (F = 2.826; p = 0.015) and the lack of organized forms of hiker skiing tourism (F = 2.599; p = 0.024).

Table 6. Model of discriminant analysis - barriers of hiking ski tourism in Polish forests depending on occupational status

| Factor | Model of discriminant analysis | | |
|--|---|--------|--------|
| | λ Wilksa: 0.7507; F(40.3564)=6.0576; p<0.0001 | | |
| | λ Wilksa | F | p |
| Lack of organized forms of ski tourism | 0.693 | 2.599 | 0.024 |
| Too expensive equipment | 0.724 | 10.064 | <0.001 |
| Time shortage | 0.717 | 8.471 | <0.001 |
| Too few ski trails | 0.704 | 5.232 | <0.001 |
| Insufficient infrastructure of ski routes | 0.694 | 2.826 | 0.015 |
| unfavourable weather conditions (humidity, wind) | 0.698 | 3.887 | 0.002 |
| Too short day | 0.696 | 3.331 | 0.006 |
| Too long distance to the trail | 0.695 | 3.161 | 0.008 |
| Lack of snow | 0.719 | 8.842 | <0.001 |

Legend: A – white collar worker; B - manual worker; C - own business; D - freelancer; E - manager/director/president; F - student/pupil

Source: Own study based on the research

Table 7. Classification function - barriers of hiking ski tourism in Polish forests depending on occupational status

| Factor | Classification function | | | | | |
|--|-------------------------|--------------|--------------|--------------|--------------|--------------|
| | A p=0.124 | B p=0.211 | C p=0.123 | D p=0.098 | E p=0.039 | F p=0.406 |
| Lack of organized forms of ski tourism | 1.211 | 1.178 | 1.131 | 1.279 | 1.503 | 1.177 |
| Too expensive equipment | 2.353 | 2.757 | 2.715 | 2.734 | 2.574 | 2.334 |
| Time shortage | 1.795 | 1.960 | 2.237 | 2.167 | 1.741 | 1.701 |
| Too few ski trails | 0.106 | 0.341 | 0.582 | 0.564 | 0.237 | 0.462 |
| Insufficient infrastructure of ski routes | 1.101 | 0.889 | 1.060 | 1.217 | 1.137 | 0.865 |
| Unfavourable weather conditions (humidity, wind) | 0.381 | 0.557 | 0.602 | 0.726 | 0.118 | 0.622 |
| Too short day | 1.654 | 1.697 | 2.011 | 1.690 | 1.626 | 1.562 |
| Too long distance to the trail | 0.762 | 0.825 | 0.626 | 0.769 | 0.761 | 0.959 |
| Lack of snow | 2.384 | 1.783 | 2.395 | 2.499 | 2.504 | 2.146 |
| Constant | 0.647 | 0.762 | 0.735 | 0.952 | 1.145 | 1.042 |

Legend: A – white collar worker; B - manual worker; C - own business; D - freelancer; E - manager/director/president; F - student/pupil

Source: Own study based on the research

In the respondents' opinion (table 7), the biggest barrier to traveling hiker skiing tourism is too expensive equipment, especially for people who are physically working (2.757) and freelancers (2.734). Natural barrier came second, in the form of too few days a year, in which there is adequate snow cover on the ski trails. This barrier was primarily highlighted by: managers, directors and company presidents (2.504) as well as freelancers (2.499), but also entrepreneurs (2.395) and white-collar workers (2.384). In third place, there is barrier of the lack of time, especially among people who run their own business and work freelance. The classification function in this case adopted the values 2.237 and 2.167, respectively. Mostly entrepreneurs complained about the short day in winter (2.011). Another barrier pointed out by the respondents was the lack of organized forms of hiker skiing tourism, which is lacking primarily for persons managing and sitting on the boards of companies (1.503). This professional group also complains about insufficient infrastructure on forest ski trails (classification function 1.137). To a lesser extent, respondents are disturbed by too much distance to the ski trails. This barrier was primarily pointed out by pupils and students (0.959). Unfavorable weather conditions during skiing tourism are mostly complained by freelancers (0.726). The barrier concerning the insufficient number of ski trails in Polish forests came last. Entrepreneurs and freelancers mainly complained about this barrier. The classification function in this case reached low values, respectively: 0.582 and 0.564.

DISCUSSION

The issues of skiing tourism in the forest have so far been rarely addressed by scientists. In Poland, these research were dealt with, among others, by Żemła, Żemła (2006), Mika (2014), Dorocki *et al.* (2014) and Krzesiwo (2015). Wheares among foreign researchers should be mentioned: Flagestad, Hope (2001), Hudson *et al.* (2004), Sánchez *et al.* (2016), Byun, Soo-Cheong (2018). However, conducting research in this direction is an important aspect from the point of view of implementing the sustainable development mechanisms in forests with highly developed tourist function (Dorocki 2014). Hiker skiing in the United States was practiced by 47% people (Cordell, Super 2015), while in Ontario, tourist skiing is the most popular form of recreation (Exall 2009). In Poland, however, the popularity of this form of recreation is low (Nowicki, Kasperczak 2001). Dorocki (2014) draws attention to the low level of physical activity of the Polish society, and skiing has a beneficial effect on the human body, which through the exercise and physical fatigue gets rid of stress and at the same time oxygenates the body with clean air. According to Hibner (2020), the motives for ski tourism are contact with nature, views, mental rest, the need for solitude, the need for physical activity, the need to spend time with loved ones. This is confirmed by the author's research. Also Olszewska (2018) obtained similar test results. Research of Borecki *et al.* 2017 confirms that Polish skiers use tourist routes in forests primarily due to the contact with nature and clean air.

On the other hand, Krzesiwo (2015) draws attention to the fact that the development of ski trails in forests can contribute to additional income for the inhabitants of the surrounding towns. These people can offer catering, accommodation, rental and ski maintenance services. The social aspect of doing this type of recreation is also important, as it strengthens family and friend ties. Analysis of the research results showed that the majority of Poles practice skiing with family members and friends.

Research by Berbeka (2016) and Hudson *et al.* (2004), prove that the most important barriers to the development of skiing are financial barriers and the perception of it as a sport difficult to master and quite dangerous. And Sadowski (2010) draws attention to the lack of suitable ski routes. This is also confirmed by research carried out by the authors of this paper.

CONCLUSION

Ski trails in forests are an important place for Poles to practice ski tourism because of the appropriate microclimate, clean air and contact with nature. Most often, the users of forest ski trails are physically employed (64.44%) and freelancers (50.00%). The Directorate of State Forests should more widely promote hiker skiing tourism in forests among Polish society, for example by organizing joint family trips or organizing social cross-country skiing. By promoting the forest skiing tourism, areas are being activated where there is no possibility of downhill skiing, which may increase their attractiveness. An important element of this type of recreation is skiing with family members and friends, which strengthens both family and friend ties.

REFERENCES

- Berbeka J. (2016): Znaczenie innowacji w turystyce narciarskiej. *Handel Wewnętrzny* 6: 212-226.
- Borecki T., Orzechowski M., Stępień E., Wójcik R. (2017): Przewidywane oddziaływanie zmian klimatu na ekosystemy leśne oraz ich konsekwencje w zarządzaniu lasu. *Sylvan* 161 (7): 531-538.
- Brian E. L. (2010): The concept of depression as a dysfunction of the immune system. *Current Immunology Reviews* 6(3): 205-212.
- Byun J., Soo-Cheong J. (2018): To compare or not to compare?: Comparative appeals in destination advertising of ski resorts. *Journal of Destination Marketing & Management* 10: 143-151.
- Cordell H., Super G. (2015): Trends in American Outdoor Recreation, In: Carther W. Line D.J. [eds.] Trends in Outdoor Recreation, Leisure and Tourism, New York: Cabi Publishing.
- Dorocki S. (2014): Tourist regions as places of development of innovativeness. *Current Issues of Tourism Research* 4: 50-57.
- Dorocki S. (2016): Wykorzystanie i stan infrastruktury narciarskiej w gminie Krynica-Zdrój w świetle badań ankietowych. Wyniki badań pilotażowych. *Annales Universitatis Paedagogicae Cracoviensis* 221: 206-217.
- Dudek T. (2016): Needs of the local population related to development of forests for recreational purposes: example of south-eastern Poland. *Journal of Forest Science* 62 (1): 35-40.
- Exall O.S. (2009): The implications of the greenhouse effect on cross country ski facilities within Ontario. Toronto: *Ministry of Tourism and Recreation Publishing*.
- Flagestad A., Hope C.A. (2001): Strategic Success in Winter Sports Destinations: a Sustainable Value Creation Perspective. *Tourism Management* 22: 445-461.
- Gilbert D., Hudson S. (2000): Tourism demand constraints: A skiing participation. *Annals of Tourism Research* 27(4): 906-925.
- Hibner J. (2020): Wpływ doświadczenia na motywy uprawiania narciarstwa na przykładzie tatrzańskich ośrodków narciarskich. *Prace Geograficzne* 161: 7-40.
- Hudson S. Ritchie, B., Timur S. (2004): Measuring Destination Competitiveness: An Empirical Study of Canadian Ski Resorts. *Tourism and Hospitality Planning and Development* 1: 79-94.
- Klimek A.T. (2010): Fizjologiczne podstawy wysiłku fizycznego w dyscyplinach wytrzymałościowych ze szczególnym uwzględnieniem narciarstwa biegowego. *Studia i Monografie* 63: 34-45.
- Krzesiwo K. (2015): Rozwój turystyki narciarskiej w świetle idei zrównoważonego rozwoju – stan badań. *Prace Geograficzne* 141: 117-140.
- Mandziuk A., Janeczko K. (2009): Turystyczne i rekreacyjne funkcje lasu w aspekcie marketingowym. *Studia i Materiały Centrum Edukacji Przyrodniczo-Leśnej* 11(23): 66-68.
- Mazurek-Kusiał A.K. (2018): Charakterystyka popytu na rekreację konną w polskich lasach. *Sylvan* 162 (9): 785-792.
- Mazurek-Kusiał A.K., Soroka A. (2021): Motywy i bariery uprawiania orientacji sportowej w środowisku leśnym. *Sylvan* 165 (2): 157-164.
- Mika, M. (2014): *Założenia i determinanty podtrzymalności lokalnego rozwoju turystyki*. Kraków: Instytut Geografii i gospodarki Przemysłowej Uniwersytet Jagielloński.
- Milleer S. (1991): A relative analysis of downhill and cross-country ski injuries. In: Mote C., Johanson R. [eds.]. *Skiing Trauma and Safety. Eight International Symposium*. Philadelphia, ASTM:133-143.
- Mruk-Tomczak D. (2014): Wybrane formy turystyki i ich związki ze zdrowiem. *Polish Nursing* 1(51):66-71.
- Netherer S., Schopf A. (2010): Potential effects of climate change on insect herbivores in European forests – General aspects and the pine processionary moth as specific example. *Forest Ecology and Management* 259: 831-838.
- Nowacki M., Kaspercak M. (2001): Stan i perspektywy rozwoju narciarstwa turystycznego w Polsce. In: Krasicki S., Chojnacki K. [eds.]: *Sporty zimowe u progu XXI wieku oraz tradycje i perspektywy Zakopanego*. Kraków. Akademia Wychowania Fizycznego: 253-260.
- Olszewska B. (2018): Motywacje osób uprawiających ekstremalne formy sportu i turystyki. *Zeszyty Naukowe Uczelni Vistula* 60(3): 119-132.

- Rolfe J., Windle J. (2015): Multifunctional recreation and nouveau heritage values in plantation forests, *Journal of Forest Economics* 21 (3): 131-151.
- Sadowski G. (2003): Turystyka narciarska. *Kultura Fizyczna* 11(12): 17-21.
- Sadowski G. (2010): Rekreacyjne biegi narciarskie. *Studia i Monografie* 63: 229-271.
- Sánchez P.L., Daries R.N., Cristóbal F.E. (2016): Economic sustainability and financial situation of the ski resorts on the Catalan Pyrenees. *Intangible Capital* 12(5): 1451–1483.
- Stróżecki A. (1991): Narciarstwo zjazdowe czy turystyka narciarska. *Gościniec* 1: 4-5.
- Żemła M., Żemła A. (2006): Wpływ czynników lokalizacji na konkurencyjność ośrodka narciarskiego. *Turyzm* 16 (1): 71–83.

Prilmljen: 27. juli 2021. / Received: July 27, 2021
Prihvaćen: 28. septembar 2021. / Accepted: September 28, 2021

