Article

Influence of Informal Education in the Forest Stand Redevelopment Area on the Psychological Restoration of Working Adults

Natalia Korcz 1,*, Emilia Janeczko 2, Ernest Bielinis 3, Danuta Urban 1, Jacek Koba 1, Paweł Szabat 4 and Michał Malecki 5

1 Department of Natural Foundations of Forestry, Institute of Soil Science and Environment Management, University of Life Sciences in Lublin, Akademicka 13, 20-950 Lublin, Poland; danuta.urban@up.lublin.pl (D.U.); jacek.koba@up.lublin.pl (J.K.)
2 Department of Forest Utilization, Institute of Forest Sciences, University of Life Sciences in Warsaw, Nowoursynowska 159, 02-776 Warsaw, Poland; emilia.janeczko@wl.sggw.pl
3 Department of Forestry and Forest Ecology, Faculty of Environmental Management and Agriculture, University of Warmia and Mazury, Pl. Łódzki 2, 10-727 Olsztyn, Poland; ernest.bielinis@uwm.edu.pl
4 Department of Agrobioengineering, University of Life Sciences in Lublin, Akademicka 13, 20-950 Lublin, Poland; szabatpawel19@gmail.com
5 Department of Forest Utilization, Warsaw University of Life Sciences, Nowoursynowska 159, 02-776 Warsaw, Poland; malecki.michal.w@gmail.com

* Correspondence: natalia.korcz@up.lublin.pl

Abstract: Background and Objectives: Nowadays, a significant part of the human population lives and works in urban agglomerations. Limited contact with nature, polluted air, stress, and a sedentary work style all contribute to problems with the physical and mental health of a considerable number of city dwellers. There are many studies indicating the positive, restorative properties of natural environments, such as forests, on human well-being. Our aim was to investigate whether suburban commercial forests in combination with informal environmental education can bring restorative properties to people, especially those who are economically active. Materials and Methods: Four psychological questionnaires were used to determine the restorative properties of a suburban commercial forest on young active people: the Profile of Mood Scale (POMS), the Positive and Negative Affect Schedule (PANAS), the Restorative Outcome Scale (ROS), and the Subjective Vitality Scale (SVS). The experiment involved 60 participants who took forest baths (the act of spending time in a forest and opening your senses to the natural surroundings to experience feelings of peace and wellbeing) in a suburban commercial forest surrounding Świdnik, a city of 40,000 inhabitants located directly next to Lublin (a provincial city with a population of 339,811). The volunteers were divided into three groups; Group A walked an educational route with educational boards (route A1). Group B walked another route with a forest educator who described various forest management activities conducted in this forest (route A2). Group C walked alone, without an educator, along route A2. All three groups arrived at the site of forest stand redevelopment as the end of their route. After a short 10-min exposure to this site, the volunteers again completed the psychological questionnaires. Results: Our study clearly indicates a positive effect from forest bathing in suburban commercial forests. Both the walk with a forest educator and the walk along the educational trail supported psychological recovery for the participants of the experiment, which shows that informal environmental education carried out in forests can be successfully combined with forest bathing, supporting the positive effects of this activity.

Keywords: suburban commercial forest; forest bathing; informal ecological education; ecological education; psychological restoration
1. Introduction

Nowadays, a significant part of the human population lives in urban agglomerations [1]. Most people choose to live in cities due to the greater opportunities for education, and to find well-paid jobs. Studies show that workers in cities earn 33% more when compared to those working outside the city [2]. However, the stress associated with living in urban areas [3] is exacerbated by stressors in the workplace [4,5]. The phenomenon of distress (stress resulting from other stress) [4,6,7] conditioned by social pressure and a lack of opportunity to discharge emotions, e.g., through sport or recreation in a natural environment, is becoming more common. Expressing stress at work may have negative consequences for employees: employers perceive employees who show signs of stress as less competent in comparison to employees who are composed or appear more relaxed [5], or even see them as professionally burned out and thus less effective [8]. Stress is compounded by a lack of physical activity. The World Health Organization (WHO) attributes approximately 2 million deaths per year to lack of physical activity; sedentary lifestyles are possibly one of the 10 leading causes of death and disability worldwide [9].

The sedentary nature of office work has further consequences in the form of diseases such as hypertension, obesity, mental illnesses, disrupted sleep patterns, or disrupted social relationships. All people, especially professionally active city dwellers, need contact with nature. Even a short 30-min walk in the natural environment allows us to regenerate, regain our vigor, calmness, and increase the scale of positive emotions [10,11]. There is a growing body of evidence supporting the health-promoting properties of walks in forested areas, referred to as forest bathing, or Shinrin-yoku [12,13]. Contact with the forest affects both mental and physical human health [14–20]. Moreover, forests are important to society, not only for their therapeutic properties or recreation and leisure opportunities, but forests also have functions such as provisioning—collecting herbs, fruits, forest mushrooms, or harvesting wood [21]—regulating—mitigating the urban microclimate, cleaning the air, and buffering climate change [22,23]—aesthetic services—enriching the landscape values of settlements and entire cities [24]—and cultural values—tourism, forest recreation, and environmental education [25,26].

Currently, in connection with the growing importance of the non-productive functions of the forest, the implementation of the concept of sustainable and balanced forest management is becoming an increasing challenge. In many countries, the opponents of the economic dimension of forestry are increasing [25,27,28]. This is particularly evident in countries such as Poland, which are dominated by public forests, largely used for economic purposes related to timber harvesting. There is little research undertaken to estimate the impact of the various forest management outcomes (e.g., harvested areas, crops, thinning, types of clearcuts, etc.) on human regeneration; the pool of data in this area is, therefore, relatively modest. Some information in this regard is provided by the works of Martens et al. [29], Herzog et al. [30], or Simkin [31]. On the other hand, it is known that the way of perceiving, for example, the forest in some sense is related to the level of education of a person, to the ecological knowledge he or she possesses [32–35], which is acquired in the process of ecological education, including the informal type (outside school).

The basis of our study was the desire to determine whether chance exposure, human contact with “accidentally” encountered forest redevelopment (forest stand redevelopment areas) has a restorative value, and what its role might be in this aspect of informal education, whose most popular form in the Polish forests is educational trails equipped with educational boards, allowing independent walks, or walks with a guide—A forest educator. The following research hypotheses were, therefore, adopted in this study:

1. Commercial forest stands have restorative properties;
2. There is no difference between the restorative effect obtained from walks in the forest and exposure to the stand redevelopment site and walks supported by environmental education;
3. The presence of a guide, a forest educator, during forest walking provides better restorative properties than those achieved by a self-directed educational walk.
2. Methodology

2.1. Test Site

The experiment was conducted both indoors and outdoors. The current emotional state of all participants, for organizational reasons, was examined in the exercise room of the University of Life Sciences in Lublin. The second part of the experiment was conducted in a forest in a suburb of Świdnik, a city of 40,000 inhabitants (Scheme 1).

![Scheme 1. Map showing the location of the study area within the metropolitan area—The blue line is the Lublin city limit, the red line is the Świdnik city limit.](image)

The selected forest area is a popular place for both daily and weekend recreation for city residents. The site chosen for the experiment is a reconstructed stand of 0.35 ha. The area is inhabited by tree species such as common beech and pedunculate oak (Scheme 2). The shape of the site, clearly visible from the drone at a height of 28 m, is quite irregular (Scheme 3). There are two flat recreational trails nearby: (A1) an educational trail equipped with 11 educational boards, and (A2) a walking trail without educational boards (Scheme 4). The topics of the educational boards on route A1 were 63% related to forest management issues and 37% to the fauna and flora found in the forest. The length of each route is about 2 km. The time needed to walk along route A1, including momentary stops to take in the educational content and make observations, is about 1.5 h, while walking along route A2 takes about an hour. The pace of walking along route A2 in both group B (with an educator) and group C (walking alone) was regulated by the participants taking part in the experiment. In groups B and C, participants intentionally but voluntarily made stops of a few seconds during forest bathing to make observations and to discuss with the educator.

The forest trail along A1 and A2 runs through broad-leaved forest [36]. The dominant tree species (those that are most abundant in an area) along route A1 is pedunculate oak (*Quercus robur* L.) aged 70–120 years, with a mixture of red birch (*Betula pendula* Roth) aged 60–85 years and Scots pine (*Pinus sylvestris* L.) aged 70 years. Along route A2, the dominant species is Broadleaf birch aged 60 to 90 years, along with Scots pine aged 90 to 110 years. Both routes lead through suburban commercial forest.
Scheme 2. The stand redevelopment site as observed by the experiment participants.

Scheme 3. Drone view from 28 m above the site of stand redevelopment.
Sound and light levels were measured with an iPhone Xs Max smartphone, using the “Sound Meter” and “Light Meter” apps. These apps have also been used in other studies as devices that meet standards comparable to professional laboratory equipment for sound analysis [15,16]. The sound level in the room was tested once, and was measured as 57.43 ± 14.26 dB. Several sound and light measurements were taken on the A1 and A2 routes, on straight sections and at intersections with other routes. In the forest environment, the average sound level on both routes was 65.41 ± 4.13 dB. The average indoor light intensity measured with a Benetech GM1030 light meter was 176.33 ± 47.84 lx, and on the trails, 445 ± 52.11 lx (route A1) and 360 ± 55.14 lx (A2).

Meteorological data prevailing at the time of the experiment (05 October 2020) were determined based on data from the nearest meteorological station—The Agrometeorological Observatory in Felin (Lublin), located at an altitude of 215 m above sea level (location: 51°14’ N, 22°38’ E). The temperature on that day was 15.6 °C, relative humidity 90%, average cloudiness (on a scale of 0–8) was 4, atmospheric pressure 987.8 hPa, and wind speed SE 5 m/s (three time-averaged values).

2.2. Study Participants

The study included 60 participants (n= 60, 29 females and 31 males) who were randomly assigned with similar sex and age ratios to one of three groups. The average age was 25 years. Each group consisted of 20 individuals who volunteered to participate in the study. Due to the circumstances caused by the COVID-19 virus, it was decided to limit the number of people participating in the experiment to the minimum necessary to ensure statistical inference. Invitations were sent via Facebook directly to last year’s graduates of the University of Life Sciences in Lublin, living in Świdnik and surrounding communities. Young, economically active people [37] were invited to the study. Each invitation specified the purpose, date, and place of the meeting, and defined the duration of the experiment. Before the experiment started, people who agreed to participate in the study were informed about the procedure and conditions of participation in the study (not consuming energy drinks, not smoking, and not using cell phones). All actions taken in the study were in accordance with the ethical standards of the Polish Committee on Ethics in Science and the 1964 Declaration of Helsinki, as amended.
2.3. Research Procedure

The first part of the experiment was conducted on the premises of the University of Life Sciences in Lublin. Participants assigned to a given group met with the research supervisor at hourly intervals in a specific, designated lecture hall of the University of Life Sciences in Lublin. The supervisors discussed in detail the conduct of the entire experiment, both indoors and in the field. Each participant filled in the psychological questionnaires on their own, and then the group moved to the meeting place designated in the forest. The first set of psychological test questionnaires completed by the participants served as a control. The second part of the study took place on two flat forest trails located in a suburban commercial forest (Scheme 5).

The average travel time for the cars to reach the second experimental site was 35 min. Each group had a specific meeting time, with group A starting the field portion of the study one hour apart from the next group. The first walk for group A began at 10 a.m. on nature trail A1. Volunteers walked the trail, following the signs along the trail, independently reading the information posted on each plaque. Each participant left the meeting place at an interval of 5 min. The trail led the experimental participants to the tree stand conversion area, where they observed the area for 10 min and then (post-test) completed the psychological questionnaires for a second time. The second group (B) of participants walked a different route to the stand conversion area, A2 (there were no information boards on this route), together with a guide, a forest educator who explained to the participants the activities performed by foresters in the commercial forest. In this part, the participants had the opportunity to have a discussion with the guide; they could ask questions and direct the conversation to the topics of interest to them concerning multifunctional forest management. After reaching the stand conversion area and undertaking a short 10-min observation of the site, participants from group B also completed the psychological questionnaires again. In contrast, the third group of participants (C) walked through the forest along the same route as group B, but were not accompanied by a forest educator. Participants were kept a few meters away from each other so that they could...
2.4. Measurements

Four psychological questionnaires were used in the experiment, as follows:

1. The Polish version of D. Watson and L.A. Clark’s scale of positive and negative affect schedule developed by Brzozowski (PANAS) [38] was used to assess participants’ feelings. It consists of 20 questions, from which ten concern positive feelings, and the same number concern negative feelings. Each question is rated on a five-point Likert scale (1—Strongly disagree, to 5—Strongly agree). The reliability and accuracy of the PANAS questionnaire are high, and this has been confirmed in many studies [16,31,39];

2. The Restorative Outcome Scale (ROS), containing six items, each of which is rated by participants using a seven-point Likert scale (1—Strongly disagree, to 7—Strongly agree). This scale, developed by Korpela [40,41], modified for forest experiments by Takayama [19], and adapted to the Polish language by Bielinis [42], was used to measure perceived restorative outcomes;

3. The Subjective Vitality Scale (SVS) developed by Ryan and Frederick [43] was used to assess vitality. The scale reflects feelings of energy, vitality, and well-being. In this experiment, a version adapted from the Woodlands study was used [19]. Four items were rated by the participants using a seven-point Likert scale (1—Very unlikely, to 7—Very likely);

4. Finally, the Profile of Mood States (POMS) was used. The Polish adaptation of the questionnaire developed by D.M. McNair, M. Lorr, and L.F. Droppleman [44] was further developed by Dudek and Koniarek [45]. The POMS is a reliable and contemporary measure of mood state, previously used to assess the impact of the
forest environment on individuals’ moods [15,16,42]. The total mood disturbance (TMD) score was also calculated using POMS data. The given tool measures six subscales of mood state: confusion or bewilderment, fatigue or inertia, anger or hostility, tension or anxiety, depression or dejection, and vigor or activity. For each question, a five-point Likert scale was used to rate participants’ mood state from 0 (strongly disagree) to 4 (strongly agree).

2.5. Data Analysis

All data were stored in Excel (Microsoft, Redmond, WA, USA), and mean values and standard deviation (SD) values were also calculated using this program. Further analysis was performed using SPSS Statistics. Analysis of variance (mixed model ANOVA) was performed with time and site as effects and their interaction. A Tukey’s post hoc test was used to refine the differences detected by the analysis of variance.

3. Results

3.1. Reliability of Scales

The internal consistencies of all scales and subscales are shown in Table 1. The Cronbach’s α was used as an internal consistency measure. ROS and POMS (as a whole) had high internal consistency, while PANAS, ROS, and SVS had good internal consistency.

Table 1. Verification of internal consistency.

| Scales and Subscales | Cronbach’s α |
|----------------------|--------------|
| PANAS                |              |
| Positive             | 0.878        |
| Negative             | 0.870        |
| ROS                  | 0.941        |
| SVS                  | 0.905        |
| POMS                 |              |
| Tension              | 0.846        |
| Depression           | 0.50         |
| Anger                | 0.794        |
| Fatigue              | 0.785        |
| Confusion            | 0.801        |
| Vigor                | 0.731        |

n = 60.

3.2. Results of Variance Analysis for PANAS, ROS, SVS, and POMS Scales—The Effect of Time

The ROS and SVS scales decreased after the walk compared to before the walk, whereas the positive and negative PANAS scales showed no effect over time (Table 2). For the POMS scale, tension, fatigue, confusion, vigor and TMD all decreased after the walk (Table 3). This means that walking in a commercial suburban forest brought regenerative and restorative values to the study participants.

Table 2. Mean and standard deviation of psychological measures before and after the experiment (for PANAS, ROS, and SVS scales) and results of a mixed model ANOVA (df = 5, df error = 114).

| Time | Measures | Mean | SD  | Mean | SD  | F     | p    |
|------|----------|------|-----|------|-----|-------|------|
|      | PANAS    |      |     |      |     |       |      |
|      | Positive | 2.90 | 0.84| 3.11 | 0.83| 3.11  | 0.145|
|      | Negative | 1.57 | 0.60| 1.48 | 0.57| 0.79  | 0.375|
|      | ROS      | 4.50 | 1.49| 5.30 | 1.15| 12.01 | 0.001**|
|      | SVS      | 4.52 | 1.57| 5.08 | 1.31| 5.41  | 0.23 |

*: p <0.05; **: p <0.01; n = 60.
Table 3. Mean and standard deviation of psychological measures before and after the experiment (for POMS test) and results of a mixed model ANOVA (df = 5, df error = 114).

| Measures | Time | Before | Mean (SD) | Post | Mean (SD) | F     | p       |
|-----------|------|--------|-----------|------|-----------|-------|---------|
| Tension   |      | 7.95a  | 5.92      | 5.56b| 5.37      | 5.31  | 0.025 * |
| Depression|      | 11.78  | 10.68     | 8.75 | 8.01      | 3.07  | 0.084   |
| Anger     |      | 11.03  | 6.34      | 9.37 | 6.63      | 2.2   | 0.142   |
| Fatigue   |      | 9.33   | 7.37      | 6.72 | 5.15      | 5.34  | 0.024 * |
| Confusion |      | 8.37   | 4.58      | 5.78 | 4.67      | 10.54 | 0.002 **|
| Vigor     |      | 16.32  | 7.50      | 18.87| 5.89      | 4.29  | 0.042 * |
| TMD       |      | 32.15  | 35.00     | 17.32| 28.07     | 6.59  | 0.013 * |

*: p <0.05; **: p <0.01; n = 60.

3.3. Results of Variance Analysis for PANAS, ROS, SVS, and POMS Scales—Effect of the Site

In group A (group with educational boards) and group B (group with forest educator), no interaction was found against the PANAS, ROS, SVS scales used (Table 4). However, in the case of the POMS scale, one of the six subscales, vigor, which is a measure of positive mood, showed statistically significant differences in the group that walked the educational path equipped with educational boards, compared to the other groups (Table 5).

Table 4. Mean and standard deviation and mixed model ANOVA (df = 5, df error = 114) results of psychological measures for the three groups during the experiment (for the PANAS test).

| Site                        | Walk with the Use of Educational Boards | Walk with A Forest Educator | Independent Walk | F    | p     |
|-----------------------------|----------------------------------------|----------------------------|------------------|------|-------|
| PANAS Positive              | 20.90 (0.80)                           | 28.10 (0.67)               | 25.09 (0.99)     | 1.27 | 0.289 |
| PANAS Negative              | 1.27 (0.30)                            | 1.55 (0.62)                | 1.62 (0.68)      | 1.98 | 0.148 |
| ROS                         | 5.23 (0.99)                            | 5.28 (1.22)                | 5.38 (1.27)      | 0.08 | 0.925 |
| SVS                         | 5.01 (1.29)                            | 5.11 (1.40)                | 5.13 (1.29)      | 0.04 | 0.960 |

Table 5. Mean and standard deviation of psychological measures and results of mixed model ANOVA (df = 2, df error = 57) on three forest trails during the experiment (for the POMS scale).

| Site | Walk with the Use of Educational Boards | Walk with A Forest Educator | Independent Walk | F    | p     |
|------|----------------------------------------|----------------------------|------------------|------|-------|
| Tension | 1.45 (0.80)                            | 1.55 (0.62)               | 1.62 (0.68)      | 1.08 | 0.348 |
| Depression | 7.35 (6.66)                           | 9.15 (8.60)               | 9.75 (8.82)      | 0.62 | 0.454 |
| Anger     | 7.75 (4.54)                            | 9.70 (8.27)               | 10.65 (6.54)     | 1.08 | 0.346 |
| Fatigue   | 8.40 (5.75)                            | 5.45 (4.44)               | 6.30 (4.96)      | 1.67 | 0.199 |
| Confusion | 5.00 (3.80)                            | 6.00 (4.83)               | 6.35 (5.38)      | 0.49 | 0.612 |
| Vigor     | 16.4b (6.18)                           | 20.05a (5.12)             | 20.15a (5.80)    | 3.37 | 0.042 *|
| TMD       | 16.45 (22.91)                          | 15.80 (31.69)             | 19.70 (30.15)    | 0.12 | 0.891 |

*: p <0.05; n = 60. a, b—Superscript letters next to the values indicate significant differences between them.

3.4. Results of Variance Analysis for PANAS, ROS, SVS, and POMS Scales—Effect of Interaction

Comparing the effects among participants in all groups, it can be seen that there were no significant differences between the group walking with a forest educator and the group walking alone in the forest before the experiment (control sample) and after the experiment (Tables 6 and 7). However, there were differences in the group of participants walking on an educational path equipped with educational boards. The greatest decrease in negative feelings was observed after contact with the forest combined with walking along the educational path, whereas the decrease was significantly smaller for the walk...
alone. When comparing the level of negative emotions before and after the walk, it was found that in group A, the greatest decrease occurred after walking the nature trail and viewing the tree stand conversion. Interestingly, it was noted that the level of negative feelings after the experiment was higher for the walk alone, unsupported by educational activities, than for the pre-test phase (Table 6).

Table 6. Mean and standard deviation of psychological measures on three forest trails during the experiment (for PANAS, ROS, and SVS scales) and results of mixed model ANOVA (df = 5, df_error = 114).

| Scheme               | Measures | Walk with the Use of Educational Boards | Walk with A Forest Educator | Independent Walk | Interaction |
|----------------------|----------|----------------------------------------|-----------------------------|------------------|-------------|
|                      | Time     | Mean       | SD     | Mean       | SD     | Mean       | SD     | F   | p     |
| PANAS Positive       | Pre      | 2.87       | 1.04   | 2.93       | 0.72   | 3.00       | 0.77   | 0.36 | 0.692 |
|                      | post     | 2.90       | 0.80   | 3.31       | 0.93   | 3.12       | 0.74   |      |       |
| PANAS Negative       | Pre      | 1.70 a     | 0.72   | 1.62 a,b   | 0.55   | 1.38 a,b   | 0.49   | 3.27 | 0.045 * |
|                      | post     | 1.27 b     | 0.30   | 1.52 a,b   | 0.62   | 1.62 a,b   | 0.68   |      |       |
| ROS                  | Pre      | 4.29       | 1.67   | 4.34       | 1.17   | 4.86       | 1.61   | 0.37 | 0.687 |
|                      | post     | 5.23       | 0.99   | 5.28       | 1.22   | 5.38       | 1.27   |      |       |
| SVS                  | Pre      | 4.24       | 1.66   | 4.26       | 1.41   | 5.05       | 5.13   | 1.02 | 0.364 |
|                      | post     | 5.01       | 1.29   | 5.11       | 1.40   | 1.58       | 1.29   |      |       |

*: p <0.05; n = 60. a, b—The same letters after mean values or no letters indicate where there is no difference between means.

Table 7. Mean and standard deviation and mixed model ANOVA (df = 5, df_error = 114) results of psychological measures for the three trails during the experiment (for the POMS test).

| Site     | Measures | Walk with the Use of Educational Boards | Walk with A Forest Educator | Independent Walk | Interaction |
|----------|----------|----------------------------------------|-----------------------------|------------------|-------------|
|          | Time     | Mean       | SD     | Mean       | SD     | Mean       | SD     | F   | p     |
| Tension  | pre      | 8.50       | 7.30   | 8.80       | 6.63   | 6.55       | 4.57   | 1.68 | 0.194 |
|          | post     | 4.35       | 4.16   | 5.55       | 6.24   | 6.80       | 5.47   |      |       |
| Depression| pre     | 12.20      | 14.14  | 13.85      | 8.60   | 9.30       | 8.32   | 1.01 | 0.369 |
|          | post     | 7.35       | 6.66   | 9.15       | 8.60   | 9.75       | 8.82   |      |       |
| Anger    | pre      | 9.96       | 5.98   | 13.45      | 7.59   | 10.00      | 4.71   | 1.29 | 0.282 |
|          | post     | 7.75       | 4.54   | 9.70       | 8.27   | 10.65      | 6.54   |      |       |
| Fatigue  | pre      | 11.75      | 10.15  | 9.45       | 4.81   | 6.80       | 5.45   | 0.90 | 0.411 |
|          | post     | 8.40       | 5.75   | 5.45       | 4.44   | 6.30       | 4.96   |      |       |
| Confusion| pre      | 8.45       | 5.95   | 8.50       | 3.43   | 8.15       | 4.23   | 0.36 | 0.698 |
|          | post     | 5.00       | 3.80   | 6.00       | 4.83   | 6.35       | 5.38   |      |       |
| Vigor    | pre      | 16.80      | 8.41   | 15.20      | 6.89   | 16.95      | 7.39   | 0.58 | 0.213 |
|          | post     | 16.40      | 6.18   | 20.05      | 5.12   | 20.15      | 5.50   |      |       |
| TMD      | pre      | 33.75      | 44.15  | 38.85      | 28.64  | 23.85      | 19.70  | 0.93 | 0.397 |
|          | post     | 16.45      | 22.91  | 15.80      | 31.69  | 30.21      | 30.15  |      |       |

4. Discussion

The respondents’ general feelings of wellbeing and perceived regeneration clearly improved during the forest walk, whereas the different forms of forest education made little difference in this regard. The results of our study indicate the positive effects of forest bathing in suburban commercial forests. This is confirmed by the results for the post hoc test for the relevant scales (ROS, SVS). The results obtained for the respondents’ mood (POMS) and mood disturbance (TMD) also confirm the positive effect of forest bathing in commercial forests on the mental state of active people. Previous studies also support our findings [29,46], notwithstanding our particular forest was more diverse in its
forest management activities. To date, studies have only considered urban forests [16,42], rural forests [47], forests that are nature reserves [16], recreational forests [29,48], or urban parks [49,50], all managed differently and varying in species composition and tree age.

There was some indication that negative affects decrease further when using passive, informal environmental education tools during the forest walk, when compared with walking independently or with a forest educator. However, the effects of the forest walk were similar, regardless of the type of forest education received, for the other mood and restoration indicators. Nevertheless, it is important to emphasize the fact that the themes of the educational boards along the route reflected, both in detail and more simple terms, the most important aspects of forest management in Poland that could be observed along the routes. To date, there have been no studies based on psychological testing to confirm the usefulness or otherwise of specific educational aids to mitigate negative emotions about the management of forested areas. This is all the more important in the current situation of numerous emerging conflicts against the background of multifunctional forest management. Education allows the public to understand the processes occurring in the forest, enabling them to better appreciate the work of foresters [25,51]. There is a growing body of evidence showing the positive effects of environmental education in terms of promoting sustainable development activities [33,52–59], and so educational trails can be helpful in mitigating some of these conflicts. On the other hand, it should also be considered that educational boards are a potentially disturbing factor in the natural forest landscape and, due to their static nature [60] when compared to the natural world, full of sensory stimuli, these boards may reduce the level of vigor by forcing people to stop and focus on specific information, rather than engaging their senses to a greater extent [61].

The results of our study do not indicate that the forest guide-educator plays a significant role in the perception of and restorative value of forest management activities, although a study by Kerley et al. [62], clearly indicates that the use of guides, who bring the natural world closer with conversation, affects the quality of users’ observations and understanding of the natural world. In addition, Broussard et al. [53] indicate that forest activities and discussions are the most effective educational method in shaping positive attitudes towards forestry, which may also translate into mitigating social conflicts over forestry issues. In general, just talking to each other can help to combat stress [63,64]. Many studies point to the positive aspects of conducting classes in open natural spaces [65–68], and Mathias et al. [69], identified forest bathing as an educational enhancement.

The act of observing the forest stand redevelopment itself did not elicit negative emotions from participants, even though they were aware that a forest had previously been logged there. Additionally, despite the fact that logging is usually perceived negatively by people such as the participants in our study, the results of our study indicate that such phenomena in the forest do not evoke negative emotions. This may be due to the fact that our participants did not observe logging activities, which often result in a kind of “devastation/distortion of the forest landscape” for the duration of logging or reforestation of the forested area.

In conclusion, in order to bring the tasks of sustainable forestry closer to the public conscience, more emphasis should be put on educational activities. They should be conducted with the participation of appropriately qualified forest educators in forest areas, including managed forests, so as to maximize the use of all the positive factors of forest bathing and forest education.

5. Limitations

The main limitation of our study was the number of participants. Unfortunately, the circumstances related to the spread of the COVID-19 virus were also a factor that may have discouraged people from participating in the study, despite the fact that the study was conducted in an open area.

The distance between the headquarters of the Lublin University of Life Sciences (the meeting point) where the pre-test was conducted and the forest was about 15 km. Covering
this distance in a car required driving through the rather crowded morning rush hour in the center of a large city. This fact may have been important for the experiment. The volunteers were traveling in their own cars, so they did not interact personally with each other. The few people who came on foot took advantage of the transport option offered by the organizers of the study. This was the most economical option to conduct this type of research. It was also the safest option due to the pandemic. However, traffic jams could have adversely affected the feelings of the participants, but this was a risk that could not be eliminated. We did not want to conduct a pre-test just before entering the forest, based on the assumption that simply seeing the forest contributes to the mood of the participants. For this reason, we decided on the variant described in the study: pre-tests in the building—Drive to the forest—Walk in the forest—Post-test in the forest. In future research, however, we should aim to reduce the travel time to the study site, and endeavor to control this aspect more.

Another important fact is that the study involved young adults who were economically active. Due to their age, they are less affected by chronic, continuous fatigue, stress, or anxiety than older people, usually working longer hours. This means that our results might be biased towards this particular group.

A further limitation that can be noted in the group of forest bathers on the nature-education trail is the difficulty in determining whether the content of the signs they read affected their mental state and whether this is determined by the positive aspect of the forest bathing itself. Similar doubts can be raised when analyzing the results for the group of people who walked the forest trail with a forest educator, who was leading a discussion about the observed forest management activities. This last example will be the subject of further research on the impact of forest education and forest bathing on perceptions of forest management.

The final limitation of the study was the use of the three different social variables (walk with educational boards, walk with forest educator, unaccompanied walk without educational boards), which was a deliberate element intended to allow the isolation of significant differences in the use of available resources for informal environmental education during forest bathing, but could also be a factor that disturbed the course of the study. This issue will also be the subject of further, more detailed research.

6. Conclusions

In this study, three variants of forest bathing were used (a self-guided walk along an educational trail, a walk with a forest educator, and a walk along a typical forest trail) ending with exposure to a forest stand redevelopment area to measure the influence of the commercial forest and informal education on the psychological restoration of economically active respondents. The analyses showed that the commercial forest, with its diverse forest stands, is suitable for forest bathing. Walking with a forest educator and a walk along an educational trail allow the participants in the experiment to improve their sense of wellbeing. This shows that both passive and active forms of education, such as educational boards and talking with forest educators, support the positive effects of forest bathing.

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