

# Influence of Nature at the Time of the Pandemic: An Experience-Based Survey at the Time of SARS-CoV-2 to Demonstrate How Even a Short Break in Nature Can Reduce Stress for Healthcare Staff

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## Abstract

**Aim:** The current COVID-19 pandemic has been causing significant upheavals in the daily lives of citizens and consequently also their mood (stress, distraction, anxiety, etc.), especially during the lockdown phase. The aim of the investigation is to evaluate the benefits of 20–30 minutes in contact with nature. **Background:** The Scientific Community, also through the evidence-based design approach, has already demonstrated the importance of greenery and nature on the psychophysical well-being of people and, in a moment of emergency, contact with the nature can be therapeutic and quite influential on the mental health of staff subject to stress. **Method:** During the lockdown, an Italian multidisciplinary working group promoted an experience-based survey, based on the Profile of Mood States methodology, for measuring the psychophysical well-being of hospital staff. **Results:** The author collected 77 questionnaires. The benefits that users have obtained from the experience in nature have been investigated by comparing the type of stresses they were subjected to and highlighting various peculiarities in the data analysis associated with the type of green in which they carried out the survey, the healthcare areas in which they worked during the pandemic emergency, and the moment in which the survey was conducted. **Conclusions:** The study has highlighted that a short break in green spaces strongly influenced the mental and psychophysical well-being of hospital staff, emphasizing the importance of nearby green spaces in architectures for health. Even a brief break in nature can regenerate users, especially in times of a stressful health emergency.

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## Keywords

COVID-19, experience-based survey, healthcare staff, experience in nature, profile of mood states, healing nature, therapeutic landscape

The current COVID-19 pandemic has caused significant upheavals in the daily lives of citizens and consequently also in their mood, in particular, during the lockdown. The Scientific Community has already demonstrated the importance of nature on the psychophysical well-being and, in a moment of emergency for users subject to stress, contact with nature (i.e., living in a place with a yard, a terrace or balcony with small plants, etc.) can be therapeutic and quite influential (Amerio et al., 2020; D'Alessandro et al., 2020).

In recent months, a survey was promoted by a multidisciplinary group, composed of professionals in the field of healthcare design, with the aim and scope of measuring the wellness of users in a rather stressful moment.

For the development of the study, a questionnaire was administered with the aim of assessing the benefits related to direct contact with nature of about 30 min, without distractions, and how it can affect the user's well-being. In order to conduct the investigation, the authors referred to the Profile of Mood States (POMS) methodology, well-known as the mood profile, starting from the studies of Prof. J. R. Grove (Grove & Prapavessis, 1992). The questionnaire was structured for the general population and medical staff, and the objective of the present article is to show the data analysis related to healthcare staff.

In recent decades, the relationship between man and nature has been investigated by several scholars, such as Kaplan and Kaplan (1995), and several theories have highlighted the positive influence of nature on users, among them Ulrich (1999). The distance between man and environment caused by industrialization and urbanization has made it difficult to experience the relationship between humans and nature, as stated in the encyclical letter "Praise Be to You" by Holy Father Francis (2015) on care for our common home. This distance has generated a lack of wellness in people, and the instinctive and healthy connection has failed spontaneously. It is

precisely because of this removal that in recent years, there has been a need to return to the natural environment. It needs to be investigated from a health's perspective of nature as a place to recover from stress, illness, a space for relaxation and fascination, a pivotal and fundamental element that can be implemented in places of care for obtaining significant improvements in the state of well-being, and so on. The current survey aims to analyze and investigate this issue.

To better understand this relationship with nature, several scholars have developed theories and research, some proven and others yet to be demonstrated. The environment has been investigated in depth through visual, practical, or contemplative experiences to test with people the healing efficacy of nature.

Among the studies in Japan, the first experiments on the psychological effects of the *shinrin-yoku* were conducted in the 1990s; this is a particular method of Japanese medicine comparable to aromatherapy, referring to the well-known "forest bathing." Experiments were activated to assess the level of the stress hormone through the cortisol contained in the saliva of users who were walking in the forest (Li, 2018). Since the 2000s, scientific progress has made it possible to measure the activities of the brain and the autonomic system, assessing the level of stress in the human body. Several scholars have begun to study the psychophysiological effects on human health (Miyazaki, 2018). The scope of our research group is to improve the studies in this direction.

Starting from the trends in hospital design, in several healthcare facilities, there are healing gardens, which are open and green spaces specifically designed both for therapeutic purposes, as tools of care, complementary to traditional ones, and to improve the well-being and quality of life not only for patients but also for relatives and medical staff.

There are many advantages due to the use of the aforementioned therapies in the natural

context. The American Horticultural Therapy Association (2020) defines therapeutic garden as “[...] a garden created in a healthcare environment that aims to promote the healing of patients and also have beneficial effects on operators, doctors and visitors; it can contain different categories of therapeutic gardens and be divided into several sectors.” The benefits deriving from the use of gardens are directly related to specific needs: (a) passive use: just being in the garden, (b) experiential fruition: experiencing in the garden, and (c) active use: working with the garden.

The in-depth scientific investigations over the years by various scholars have highlighted the effectiveness of natural environments on the psychophysical well-being of users. The need for contact with natural areas, gardens, terraces, and so on became stronger during the lockdown. The influence, that these areas—whether small or large—have in terms of wellness, can also be seen in the immersion in nature in just a few minutes (Capolongo, Rebecchi, et al., 2020). In order to improve the knowledge in the field, the authors assessed the beneficial ways in which green areas can affect hospital staff and highlighting its strategic role in healthcare facilities.

## Materials and Methods

In order to conduct an experience-based study, the authors used the POMS methodology. It requires the user (a) to fill in questions relating to general information, (b) to fill in the 34 items of POMS before the experience in nature, (c) to have the experience in order to really derive the greatest benefit from nature (it is essential that the test must be carried out without mobile phone, tablet, watch, or other technologies), and (d) to fill the 34 items of POMS after the experience in nature.

The number of items is rather short, and the compiling takes approximately 5 min but the experience-based survey requires 20–30 min in nature. In order to analyze all the information, it is necessary to fill in the questionnaire in its entirety.

In addition to some information about the users, the sections which are filled in online requested: (a) professional qualification, (b) typology of health system, (c) typology of healthcare facility, (d) years of experience in the field of

assistance, (e) the functional unit (COVID/non-COVID area), (f) presence of a garden and/or green area in the healthcare facility, (g) space in which the experience based on nature was conducted, and (h) the moment in which the survey was conducted.

The study refers to Grove’s previous studies with the same list of 34 criteria as Table 1 shows. The order of terms is defined by the methodology: Many of the emotions appear to be the same, in fact, they are similar and the choice to use synonymous terms is inherent to the method. These different shades of adjectives refer to six macro-areas of mood as Table 2 shows. Each area is associated with different scores in relation to the number of emotions; four points are associated with each mood state as Table 2 shows.

The questionnaire was disseminated through mailing lists, social networks, and web pages, with the aim to reach a representative number of 200 participants.

## Results

The questionnaire was accessible from April 18 to May 10, 2020, in Italy. Responses were received from 77 health workers (61% women, 38% men, and 1% others as Figure 1 shows, and they were 62% doctors, 13% nurses, 3% unlicensed assistive personnel, and 22% others as Figure 2 shows).

Although the responses were less than expected, during the pandemic, several questionnaires were submitted. It also required about 30 min to be filled in, which may therefore have limited the participation to a reduced number of users. In order to properly develop the data analysis, the authors took into consideration various correlations between the criteria so as to highlight the benefits to users. Three comparisons are made: treatment area (COVID/non-COVID), moments in which the survey was carried out, and the typologies of green spaces used.

### *Comparison According to the Treatment Area (COVID and Non-COVID)*

Starting from the data analysis, 45% (35 participants) of the users worked in COVID areas, as Figure 3 shows, of whom 24 were doctors.

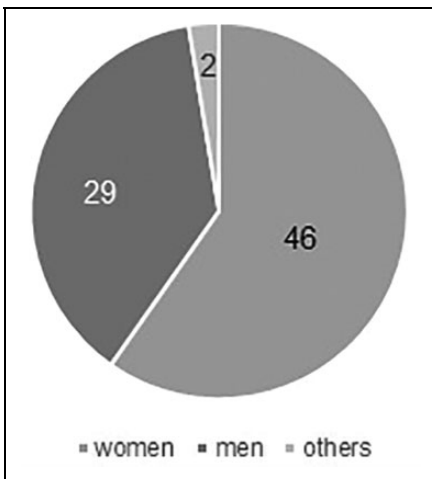
**Table 1.** List of 34 Items of Profile of Mood States With the Respective Scores.

State of the Mood		Not At All 0	A Little 1	Moderately 2	Quite a Lot 3	Extremely 4
Tense	ANX	0	1	2	3	4
Angry	ANG	0	1	2	3	4
Worn-out	FAT	0	1	2	3	4
Unhappy	DEP	0	1	2	3	4
Lively	FOR	0	1	2	3	4
Confused	CON	0	1	2	3	4
Sad	DEP	0	1	2	3	4
Active	FOR	0	1	2	3	4
On edge	ANX	0	1	2	3	4
Grumpy	ANG	0	1	2	3	4
Energetic	FOR	0	1	2	3	4
Lacking of hope	DEP	0	1	2	3	4
Uneasy	ANX	0	1	2	3	4
Restless	ANX	0	1	2	3	4
Unable to concentrate	CON	0	1	2	3	4
Fatigued	FAT	0	1	2	3	4
Annoyed	ANG	0	1	2	3	4
Discouraged	DEP	0	1	2	3	4
Resentful	ANG	0	1	2	3	4
Nervous	ANX	0	1	2	3	4
Miserable	DEP	0	1	2	3	4
Bitter	ANG	0	1	2	3	4
Exhausted	FAT	0	1	2	3	4
Anxious	ANX	0	1	2	3	4
Helpless	DEP	0	1	2	3	4
Weary	FAT	0	1	2	3	4
Energized	FOR	0	1	2	3	4
Bewildered	CON	0	1	2	3	4
Furious	ANG	0	1	2	3	4
Worthless	DEP	0	1	2	3	4
Forgetful	CON	0	1	2	3	4
Vigorous	FOR	0	1	2	3	4
Uncertain about things about things	CON	0	1	2	3	4
Drained	FAT	0	1	2	3	4

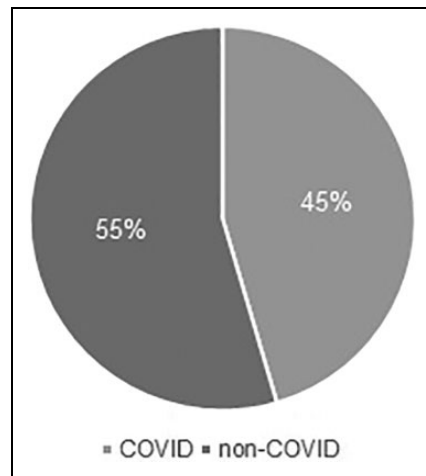
Abbreviations: ANX = Anxiety; DEP = Depression; ANG = Anger; FOR = Force; FAT = Fatigue; CON = Confusion.

**Table 2.** Lists of States of the Mood.

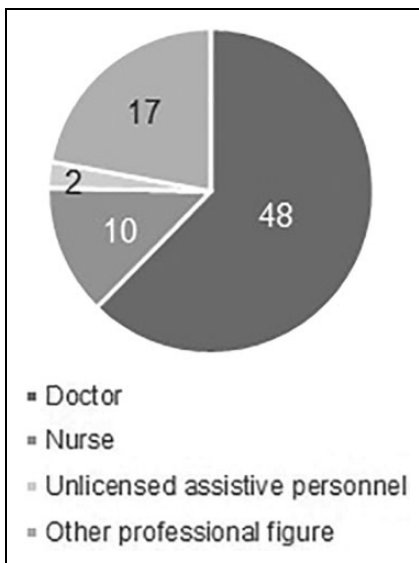
Mood	Emotions	Total Points
Anxiety (ANX)	Tense, on edge, uneasy, restless, nervous, and anxious	24
Depression (DEP)	Unhappy, sad, lacking of hope, discouraged, miserable, helpless, and worthless	28
Anger (ANG)	Angry, grumpy, annoyed, resentful, bitter, and furious	24
Force (FOR)	Lively, active, energetic, energized, and vigorous	20
Fatigue (FAT)	Worn-out, fatigued, exhausted, weary, and drained	20
Confusion (CON)	Confused, unable to concentrate, bewildered, forgetful, and uncertain about things	20



**Figure 1.** Number of participants per gender.



**Figure 3.** Outcomes of the macro-areas subdivided into medical staff in COVID and non-COVID areas.



**Figure 2.** Professional qualification of healthcare staff.

The analysis investigates the different needs of users, and, starting from the peculiarity of the equal number of doctors among COVID and non-COVID areas, the authors made a point to focus on their individual answers. As Tables 3 and 4 show, slightly more people carried out the survey on their day off.

In general, the data show that in a moment of emergency, users during a break in the work shift were able to take advantage of nature and found a

greater improvement (Nejati et al., 2016). Results related to users' well-being in COVID and non-COVID areas are similar as Figures 4 and 5 show.

**Anxiety.** Similar trends are observed for this mood, with a reduction of 57% for staff in COVID areas (the sample of doctors is 66%) and 66% for non-COVID areas (physicians equal to 71%). The initial average values before the survey are lower in non-COVID areas, with the exception of "tense," and it is observed that the level of anxiety after the experience is highly reduced. From a detailed analysis, some participants gave a higher value after the experience (about one point more); these values are similar between the two populations, with particular recurrence of "uneasy," "restless," and "anxious" ones. The same analysis, focused only on doctors, shows that "tense," "nervous," and "anxious" are higher in non-COVID areas and with a greater variation before and after the experience. Other workers also experienced a particular benefit on "tense," "restless," and "anxious."

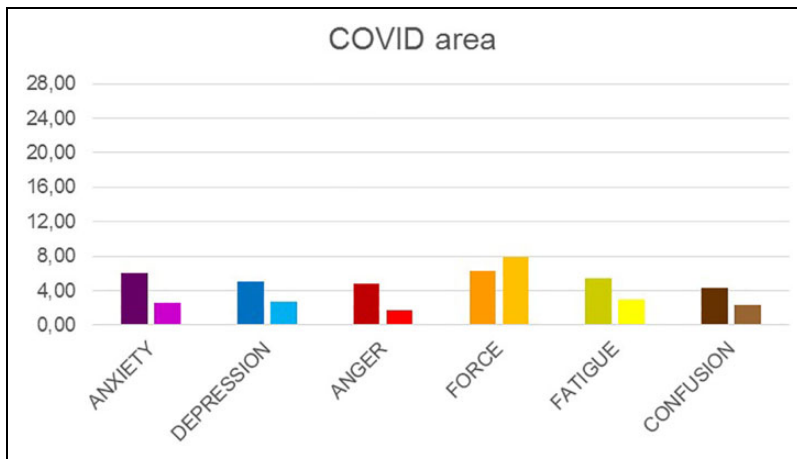
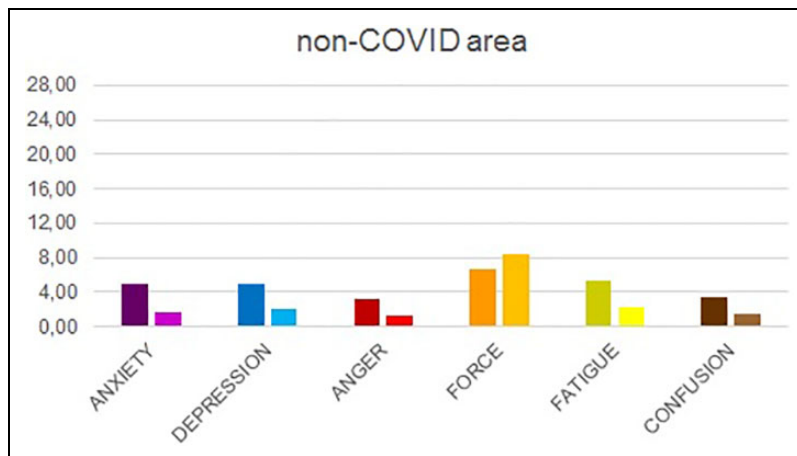
**Depression.** There are similar trends with a reduction of 47% in COVID areas and 60% in non-COVID ones, and the samples of doctors are equal to 64%. The initial mean values are rather similar, although the non-COVID areas have higher peaks, with values twice as high after the

**Table 3.** Comparison among Users who participated in the Survey subdivided into COVID and non-COVID Areas.

Working Area	Doctors	Nurses	Unlicensed Assistive Personnel or Similars	Other Professional Figures
COVID area	24	7	0	4
Non-COVID area	24	3	2	13

**Table 4.** Comparison related to the Moment in which the Survey was conducted by Healthcare Staff subdivided into COVID and non-COVID Areas.

Working Area	Day Off	Before the Work Shift	During the Work Shift	After the Work Shift	Other
COVID	9	2	5	7	1
Non-COVID	12	4	2	4	2

**Figure 4.** Outcomes of the macro-areas in COVID areas.**Figure 5.** Outcomes of the macro-areas in non-COVID areas.

experience. On the other hand, the “lacking of hope” has rather low initial values (median and mode equal to 0), but among the users, the values in non-COVID areas, after the survey, show a significant reduction equal to 64%. From a detailed analysis, some users recorded a higher value after the experience. These values are equal with a particular recurrence of “worthless,” “miserable,” and “lacking of hope” items. The same examination, focused only on physicians, shows that the initial average values are greater in non-COVID areas, and with a significant reduction (range of 45%–70%, with a peak equal to 100% for “lacking of hope”). Others also had a particular benefit on specific items and the most common ones are “discouraged” and “helpless.”

**Anger.** Higher values were recorded by the sample of users in COVID areas. In fact, there is a reduction of 65% in COVID areas (the sample of doctors is 70%) and 60% for non-COVID areas (physicians equal to 72%). The highest values are recorded in general by staff in COVID areas. In particular, “bitter” has generally the highest value (initial median equal to 1 and mode 0 and then to 0). Some users were affected by the experience, in particular, on “bitter” and “resentful” items in COVID areas. The answers of physicians show that “angry” and “grumpy” are higher in non-COVID area, and there is also a high reduction on “furious.”

**Force.** It is the only area in which values increase among the moments in which the survey was conducted. Users have an increase of 25%, and the sample of doctors is equal to 10%. From an overall view, it is interesting that before and after the survey, the trends are very similar with greater peaks in COVID areas. In particular, “lively” has an increase of 42% for both samples, as well as “energetic,” respectively, 20% in COVID areas and 24% in non-COVID ones. “Active” in non-COVID area increases only by 7%, unlike 30% in COVID areas; while, on the contrary, “vigor” has a greater benefit on users in non-COVID area (28%), unlike other workers increase by only 16%. From an overall analysis, many values have remained unchanged and/or decreased (15 of 35 participants in COVID area assessed, at least, two

unvaried items, and 24 of 42 of the non-COVID area with at least two). Only some workers recorded a particular benefit from the experience in nature. Other workers, in non-COVID area, had a particular benefit on “vigorous.” The same analysis focused on doctors shows that the sample had a punctual increase after the survey. In particular, the various negative responses are also partly associated with users in non-COVID areas, because “active” and “energized” had a decrease (3%); for physicians in COVID area, “lively” and “active” items had greater values, respectively, 20% and 14%, unlike the other ones who recorded the most influential values for “lively” (25%) and “vigorous” (35%).

**Fatigue.** Very similar values are recorded for both the samples before the survey, but after the experience, there is a greater reduction in non-COVID areas equal to 57% (for doctors it is equal to 55%) and 47% for the other ones (for the doctors 44%). In particular, “worn-out” and “fatigued” items have similar trends, in fact, there is a reduction of 46% and 59%, respectively, for COVID areas and 50% and 57% for non-COVID ones. In general, it is observed that in non-COVID areas, the other items also tend to decrease with ranges between 53% and 75%, while for the other workers, “exhausted” item has a reduction of 28% (due also by the emotional state of staff). From an overall analysis of the individual responses, it is observed that, compared to the other macro-areas, the negative answers are rather reduced. Some users have had a positive and good influence from the experience. The same analysis, focused only on physicians, shows that “worn-out” and “fatigued” have similar trends in fact there is a reduction of 41% and 63%, respectively, in the COVID area and 47% and 54% for non-COVID areas. In general, it is observed that in non-COVID areas, the other items relating to fatigue also tend to decrease with ranges between 50% and 71%, while the other workers’ “exhausted” and “drained” items see a reduction of 25% and 33%.

**Confusion.** Very similar values are recorded before the survey, but after the experience, there is a greater reduction for users in non-COVID areas equal to 56% (physicians equal to 64%) and only

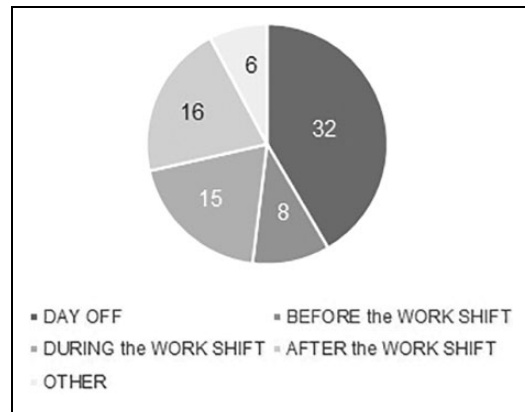
**Table 5.** Moments in which the Survey was conducted by Healthcare Staff.

Users	Number of Participants
Users on the day off	32
Users before the work shift	8
Users during the work shift	15
Users after the work shift	16
Other on maternity leave, vacation, sick leave, and so on	6

45% for COVID ones (doctors 44%). In particular, in non-COVID areas, the experience had a greater influence than in COVID areas. Only “bewildered” item is similar for users with a reduction of 52% (from initial values of median and mode, respectively, equal to 1 and 0, and subsequently to 0). From an overall analysis of the individual responses, it is observed that, compared to the other macro-areas, even in this macro-category, the negative answers are rather reduced. Some workers had a particularly good influence from the experience in nature. In general, however, it is observed that various users, in particular users in COVID areas, before and after the survey, assess values from 0 to 2 for “unable to concentrate,” which in social and psychological terms can however also have a positive meaning because it means that users in the green have the opportunity to be distracted. The same analysis focused only on physicians shows that the values of doctors in COVID areas are very similar to the data, while for the other sample much higher reduction values are observed, including “confused” item equal to 88% (compared to 77% of the entire sample), “unable to concentrate” 47% (compared to 41%), “confused” 67% (compared to 52%), and “forgetful” 67% (compared to 57%).

### *Comparison among the Moments in which the Survey was carried out*

The users who took part in the survey are quite heterogeneous, as Table 5 and Figure 6 show, with a greater preponderance of workers on their day off. The latter one was not considered representative for the purposes of the survey and therefore the data-analysis does not refer to these answers. Users took part in the survey particularly

**Figure 6.** Number of participants subdivided into the type of green area in which the survey was conducted.

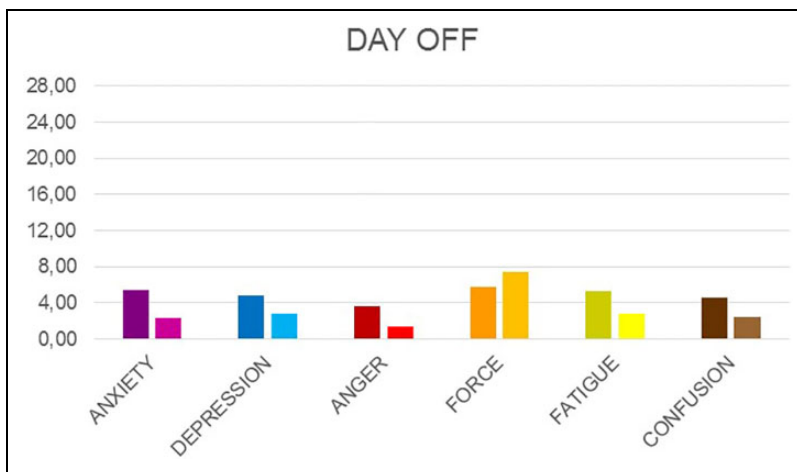
in green areas to regenerate and regain greater calm and strength.

In general, the survey was conducted mostly in private spaces. Starting from a detailed analysis of the answers, the authors observed some peculiarities: a user who did the experience on a day off in the garden of a healthcare facility because probably his flat is near the hospital or because he lives in an inpatient hotel temporarily; no user before the work shift carried out the survey in the garden of the healthcare facility; among the users who took part in the experience-based survey during a break during the work shift, only some used the garden and others used terraces of their healthcare facility; while other users, probably during the lunch break, carried out the survey in their private or shared garden, and some in the absence of a specific area in the hospital, in a nearby public park. Those who participated in the survey after the work shift mainly carried out the experience at home, and only three in healing gardens, as Table 6 shows.



**Table 6.** Moments in which the Survey was conducted subdivided into Typologies of Green Areas.

Moment	Green Space in Healthcare Garden of an Healthcare Facility	Public Green Space		Private Green Space	
		Shared Garden	Public Park	Private Garden	Balcony/ Terrace
Day off	1	3	4	12	12
Before the work shift	/	1	2	1	4
During the work shift	3	3	2	5	2
After the work shift	3	/	1	7	5
Other	/	/	/	3	3

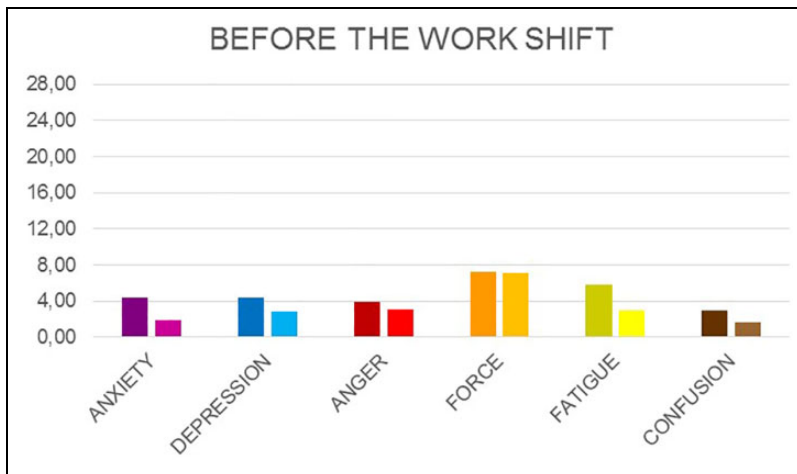
**Figure 7.** Outcomes of the macro-areas during the day off.

The survey shows that the most effective moment for a greater benefit on the mental health of the workers is associated with the short break during and after the work shift as Figures 7–10 show.

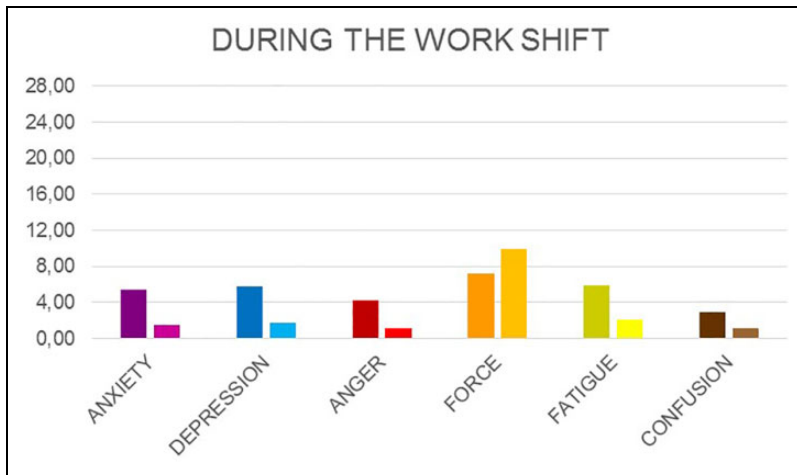
**Anxiety.** The comparison among the four moments in which the survey was carried out highlighted a significant reduction of the state of mood of about 60% for all the categories, with a higher peak (72%) for the sample during the work shift. In particular, the highest values are recorded in the sample of users who carried out the survey during a break in the work shift with a reduction of 88% for “uneasy” item (although in value of mean and median pre and post is equal to 0) and 82% of “on edge” (mean and median values are, respectively, 1 and 0 before, and 0 after). On the other hand, it is observed that for the sample before the work

shift, “on edge” and “anxious” items are rather reduced (mean and median values equal to 0 both before and after the survey). Finally, from an overall analysis of the individual answers, some users had a particular influence from the experience in nature, in particular for “anxious.” In addition, some users gave higher values after the experience (one point more), but compared to the general survey, they were not particularly influenced. In any case, they are distributed equally and there are no correlations related to the type of green.

**Depression.** There is a reduction in the emotional state of about 30%–40%, respectively, on the day off and before the work shift, while better performances are recorded (higher than about 60%–70%) for those who filled in the questionnaire during and after the work shift. In particular, the



**Figure 8.** Outcomes of the macro-areas before the work shift.

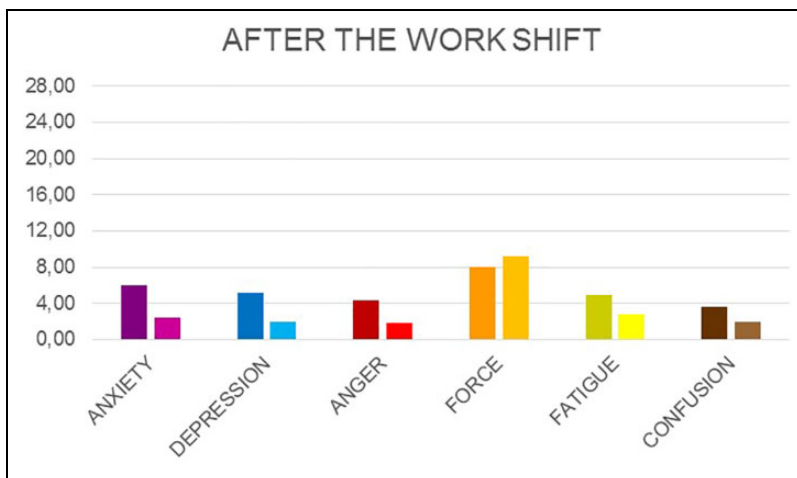


**Figure 9.** Outcomes of the macro-areas during the work shift.

lowest values are recorded in the sample of users who carried out the survey before the work shift with unchanged values of “lacking of hope” and “worthless” (0%). In general, the greatest benefit values are associated with those who participated in the survey during a break in the work shift (about 60%–80%, with median and mode values around to 0 and 1 before the survey, then equal to 0 after) and also for those who after the work shift for “miserable” (69%) and “helpless” (75%) items. From an overall analysis of the individual responses, some subjects had a particularly good influence from the experience, in particular, in

“helpless” and “disheartened” (Nejati et al., 2016). Some users gave a higher value after the experience in nature (one point more), but only the population of those who carried out the survey on the day off or before the work shift.

*Anger.* A significant reduction in the emotional state is registered between 60% and 70%, with a greater evidence for those who have carried out the experience-based survey during the work shift, while a reduction of about 20% for those who carry out the activity before the work shift. This reduced value is mainly due to “bitter”



**Figure 10.** Outcomes of the macro-areas after the work shift.

which is greater after the experience in nature, which increases by 67% (taking into account that the values before the survey were, respectively, 0.5 of median and 0 of mode, and then pass to 0). The partial scores highlighted that the lowest values are recorded in the sample of users who carried out the survey before the work shift with unchanged values of “resentful” and “furious” items. “Anger” has generally a value with a considerable reduction for all users, between 57% and 64% (whose average and median is equal to 0, both before and after the survey), a difference of those who participated in the survey after the work whose values are reduced by only 36% (median and mode values are equal to 0, both before and after the survey). From an overall analysis of the individual responses, some users had a positive influence from the experience in nature, in particular, “bitter” and “resentful,” noting that users worked in COVID areas (five of six participants).

**Force.** It is the only area in which values increase after the survey. In fact, as already explained, strength is the emotion that—in the presence of greenery—can be strongly influenced (Berto et al., 2015). The data emerging from the survey are quite different. The best performing values refer to those who conducted the test during a break during the work shift (about 40%) and those who were on the day off (about 30%); the values

associated with the experience after the work shift are rather contained (about 15%), while those before the work shift are poorly performing, even with lower values after the experience (−2%). In particular, the highest values are recorded in the questionnaires of the sample during the work shift and, in particular, “lively” item is equal to a value of 136% (passing from median and mode values of 0 to 2) and, subsequently, “energized” equal to 88% (passing from median and mode values of 0 to 2). As already emphasized, the values recorded on the sample of users who carried out the survey before the work shift are rather peculiar, which in fact have reduced values, before and after the survey, “active,” “energetic,” and “energized” (a reduction of about 7%–10%), an unchanged value of “lively” and a slight increase for “vigorous” (10%). The data relating to this macro-category have scores that—in most of the results—remained constant before and after the survey, and different users—without a real distinction—gave lower scores, at least three mood states, after the experience.

**Fatigue.** There is a significant reduction in the emotional state of about 45%–50%, with greater evidence for those who carried out the experience-based survey during the work shift, equal to 64%. In particular, the greatest reduction is recorded for “worn-out” and “fatigued,” where the results are quite varied. For subjects who

**Table 7.** Numbers of Users Subdivided Into Typologies of Green Areas.

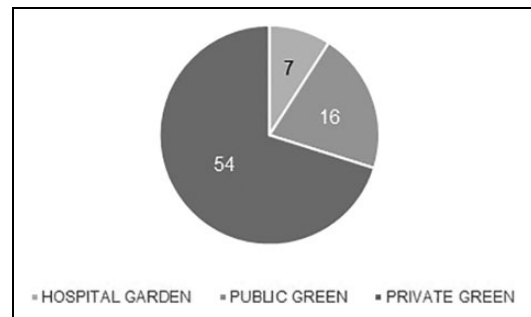
Typology of Green Area	Number of Participants
In the garden of an healthcare facility	7 Participants
In a public space	16 Participants, subdivided into: <ul style="list-style-type: none"> <li>• 7 in shared gardens</li> <li>• 9 in the public parks</li> </ul>
In a private space	54 Participants, subdivided into: <ul style="list-style-type: none"> <li>• 29 in a private garden</li> <li>• 25 in the own balcony/terrace with vegetation</li> </ul>

completed the questionnaire during a break in the work shift, a significant improvement was observed in “weary” (reduction equal to 72%, passing from a median and mode of 1 and 0, respectively, to 0). Differently, before the work shift, on average, “exhausted” item is unchanged (although the median and mode values change from 1 to 0), while for those who filled in the questionnaire after the work shift “drained” varied slightly (about 15%, with median and mode values equal to 0) before and after the survey. Some users had a particularly good influence from the experience, in particular, for “weary” and “exhausted,” observing that most of the answers are associated with users who filled in the questionnaire during a break in the work shift.

**Confusion.** The benefit of the experience stands with a reduction of the state of about 46%–48%, with greater evidence for those who had the experience during the work shift, equal to 61%. “Unable to concentrate” item during a break in the work shift recorded a reduction (9%), unlike the other users around 30%–40%. On the other hand, the most relevant scores are associated with “forgetful” (67%) and “uncertain about things” (91%).

### Comparison of the typologies of Green Spaces used during the Survey

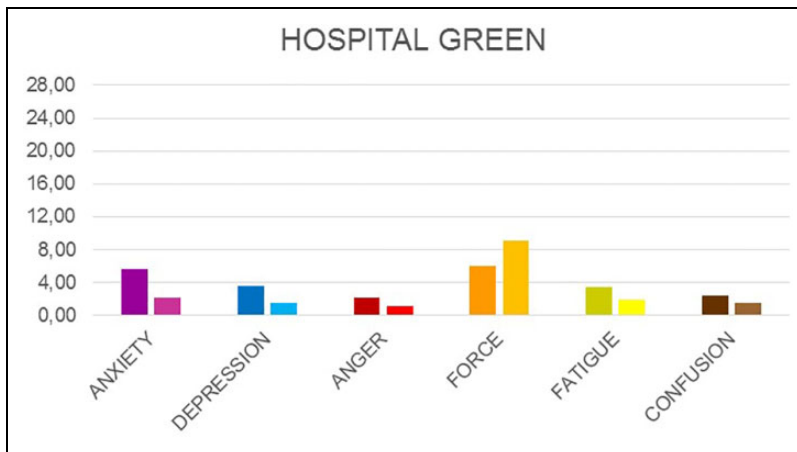
The users who took part in the survey are quite varied, as Table 7 and Figure 11 show, with a greater preponderance on the day off. The sample of private spaces is considered the most representative for the aims of the survey, since it has a rather large number of users. This focus aims to analyze benefits to the users in a private or public space and in green spaces of a hospital.

**Figure 11.** Number of participants subdivided into the type of green area in which the survey was conducted.

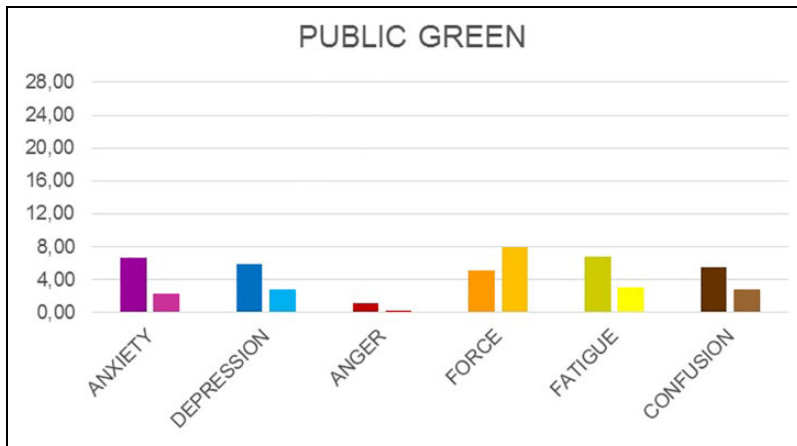
The survey shows that there is no specific green space for the greatest benefit on staff wellness, but the garden within a hospital highlights the greatest benefits related to strength as Figures 12–14 show.

**Anxiety.** Comparing the typologies of green spaces in which the study was carried out, a significant reduction in the state of mood was recorded with a range between 60% and 66%. The highest values are recorded especially in public parks and hospital gardens; in particular, “tense” has a significant reduction among the users in public parks (75%) and “uneasy,” “restless,” and “nervous” in healing garden. From an overall analysis, some physicians of the three samples were particularly influenced by the experience, and others also had some benefit on “tense” and “anxious.”

**Depression.** For all the users, a common reduction of about 53%–56% was recorded. In particular, the values with the greatest benefit for the user were recorded in the gardens of healthcare facilities. From an overall analysis, some users had a



**Figure 12.** Outcomes of the macro-areas in hospital green.



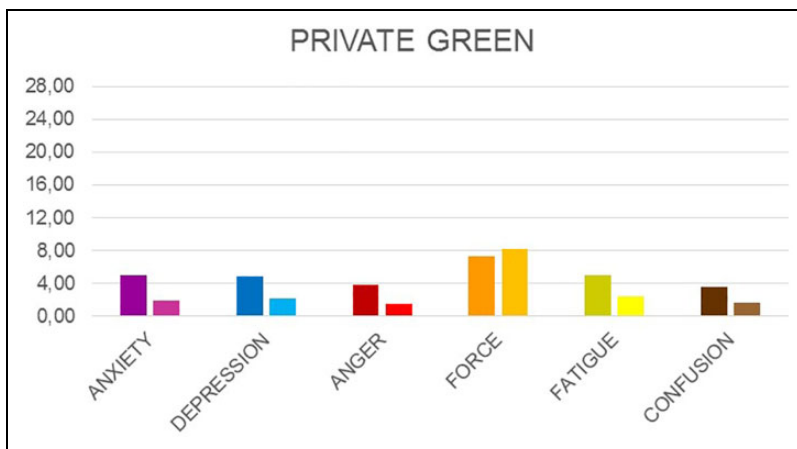
**Figure 13.** Outcomes of the macro-areas in public green.

particular influence from the survey, and others also had particular benefits on some topics, and the most common ones are “discouraged” and “helpless.” Some participants gave a higher value after the experience (one point more), especially in public or private gardens.

**Anger.** There are three different outcomes: If in the public green there is a reduction of 84%, differently in private ones there is a reduction of 60% and in healing gardens 47%. The Anger is strongly correlated to the users’ mood, and the data show that, even if the levels of “anger” have a greater reduction in the private or public space, compared to those who have had the experience

in the garden of the healthcare facility, anger levels are observed to be much higher in those who filled in the questionnaire on the day off. In particular, the values with the greatest benefit for the user are recorded in the public garden: angry (90%), grumpy (88%), annoyed (80%), resentful (71%), bitter (79%), and furious (67%). Instead, “annoyed” and “furious” items in the healing garden have values unchanged before and after the investigation. From an analysis of individual answer, the users had a particular influence on “bitter” item.

**Force.** It is the topic in which the values increase before and after the test. The data emerging from



**Figure 14.** Outcomes of the macro-areas in private green.

the survey are different among the users: In fact, if for those who conducted the survey in the garden of the healthcare facility or in the public area, the values increase, respectively, by 52% and 48% (with median and mode values from 1 to 2), for those in the private garden, it is only around 12% (with values of median and mode, before the survey, respectively, equal to 1 and 2 and then to 2). In particular, the highest values are recorded among the users who have carried out the survey in public parks, with the exception of “lively” with an increase of 225% in the garden of a hospital (median and mode values from 0 before the survey to 1 after). This value is strongly influenced by the reduced number of users in the category. From an overall analysis of the individual responses, many values have remained unchanged and/or decreased: In fact, three of the seven participants in a healing garden highlighted at least two items with unchanged and/or reduced values; six of 16 in a public space at least two lower and/or equal values; 30 of 54 in a private garden at least two lower and/or equal values. Only some workers had a particular good influence from the experience in nature, especially for “lively,” “energized,” and “energetic.” Punctually other users also had a particular benefit on “vigorous” issue.

**Fatigue.** There is a reduction in the emotional state of about 46%–56%, with greater evidence in

public gardens. In particular, the greatest reduction is recorded in public parks where the initial values are much higher than other samples. From a detailed analysis, for green areas of healthcare facilities, “exhausted,” “weary,” and “drained” items are low, and with a reduced variation before and after the experience, the values of median and mode remain equal to 0. From an overall analysis, the negative responses are rather reduced. Some users of the three populations had a positive influence from nature.

**Confusion.** The benefit of the experience registered a reduction of the confusional state of 35%–53%, with greater evidences in private green spaces. In public and private areas, the users had rather positive effects: for the “confused” item, respectively, 62% and 66% and “forgetful” 50% and 48%, and “unable to concentrate” 53%, “confused” 63%, and “uncertain about things” 71% for public parks. In particular, two data are observed: For “bewildered” item in the garden of hospital, the value remains unchanged before and after the survey (with median and mode values equal to 0); for “unable to concentrate” in public green areas, the values increase, so much as three subjects recorded a higher response (from 0 to 2). From an overall analysis of the individual responses, even in this macro-category, the negative responses are rather reduced. Some users had a positive influence from nature.

## Conclusions

The main topic that emerges from the investigation is that in a moment of extreme emergency, physicians received advantages from a break in nature. The greater improvements were recorded for hospital staff in COVID areas.

User has found their maximum benefit in a green area, especially during the work shift. In these hard times, we could mention some thinking styles, referring to studies by Sternberg, involved such as “relationship and tasks”: It was necessary for those who need to regenerate in nature with the presence of some colleagues; others may have been used to regaining strength and continuing to do what they were doing. Styles influence each other and they are rarely pure as every person, even if he prefers a behavior, he does not remain indifferent to the rest.

Starting from a general analysis, it is interesting how the strength of users increases after the experience. In fact, the information collected from the outdoors is processed only through their senses (sight, hearing, touch, taste, and smell) so the users analyze these data using these thinking styles (Sachs, 2020). Specifically, getting in touch with nature activates all these senses. The person who prefers their sight will therefore notice the variety of colors of the plants and flowers. The user who prefers their hearing will notice all the sounds, noises, or the absence of noise (ward trolleys, steps, patient bells, etc.). Kinesthetic people, who prefer touch, taste, and smell sensations, will perceive more emotions when they are immersed in nature, touching the ground and smelling trees and plants.

The study highlights the great influence that nature can have on the well-being of users, even in a short time. Although the number of questionnaires was limited to 77 users, the data processed are rather representative and supportive to develop useful considerations.

*The study highlights the great influence that nature can have on the well-being of users, even in a short time.*

The authors undertake, for future similar studies, to conduct the survey again in order to expand the number of questions and get more detailed

information to better support the data analysis. In particular, starting from a general examination and various comments by users about the questionnaire, it is considered appropriate to supplement the questionnaire with the following information: (a) geographical location of the user and urban context in which the survey was carried out, (b) duration of the immersion in nature, (c) specifications on the user’s day and possible factors that may justify the presence of anomalous data, (d) specifications relating to the space in which the survey was conducted and distracting and/or disturbing factors, (e) state of the green area in which the survey was conducted, (f) activities carried out during the investigation, (g) sensory activity, and (h) additional information about the participant.

As already demonstrated, green can promote health by improving the outdoor air (Buffoli et al., 2018) and, furthermore, the view into greenery (garden or park, green roofs, etc.) can improve the well-being of users. The study has shown how even a brief break in nature can regenerate users, especially in times of stress.

*The study has shown how even a brief break in nature can regenerate users, especially in times of stress.*

From the data analysis, for many users, the values are between the values 0 and 2, and therefore, on average, they do not have particular peaks. In any case, the different answers during the investigation highlight the effects that a brief break in green space can have on well-being.

Although the importance of green space for patients has already been demonstrated, the investigation shows that the presence of green spaces, both gardens and/or terraces, within the hospital, or public parks near hospitals (George et al., 2015), can highly affect the stress reduction of hospital staff in daily life (Marcus, 2015).

*... demonstrated, the investigation shows that the presence of green spaces, both gardens and/or terraces, within the hospital, or public parks near hospitals.*

Currently, there are several international case studies that can be adopted as exemplars, referring



to their green areas, such as Queensland Children's Hospital in Melbourne (Australia), New York–Presbyterian Hospital (New York, United States), Policlinico di Milano (Italy), Alder Hey Children's Hospital in Liverpool (UK), and so on.

In fact, the presence of spaces for psychophysical well-being is strategic for all users, and it positively influences the work performance of medical staff. In case of emergency, it could guarantee spaces for users to relax from psychological stress and daily pressures. They can be either areas inside the healthcare settings—close to the functional areas—or green areas of hospitals, preferably with a variety of spaces, different seats, and isolation points to ensure user's privacy (Capolongo, Gola, et al., 2020).

## Implications for Practice

- Highlighting the role that green areas (gardens in patios and courtyards, healing gardens, terraces, etc.) can be strategic not only for aesthetics or ordinary activities but improving the well-being of users.
- Supporting the designers to take in considerations biophilic design strategies in inside and outside the healthcare facilities. It can be a value added of the project.
- Supporting the healthcare organization to guarantee to healthcare staff—in stressful moments—to have breaks during the work shift for improving their well-being.
- Improving the knowledge related to the effects that green and nature can affect on users, especially in stressful moments.
- Improving the knowledge related to healthcare design and how the built environment can affect the mental health and well-being of users.
- In case of future lockdowns and/or emergencies, to apply the survey to a largest sample of users.

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