Abstract

Introduction: Depression the most common psychological problem prevails across the world. To deal with depression, psychotropic drugs are generally prescribed by the clinicians which have enormous side-effects. Nature walk refers to a walk in the natural area containing wild flora and fauna, undisturbed by the anthropogenic means. The nature walk is considered as a live meditation which imparts mental peace in the walkers. But limited evidence is availed till date reporting the role of a nature walk in instigating positive mood. Therefore, present work was carried out to evaluate the potential role of a nature walk in decreasing depression by instigating the positive mood. Methods: For this, a nature walk was organized for 20 participants in Chhatbir Zoo, Chandigarh. The mood of participants was assessed by using the BMIS instrument. Results: Results of the present study revealed that nature walks significantly instigate the positive mood. Conclusion: Based on our results, we suggest that nature walk can be used as an intervention to manage depression.

Keywords: Depression, happy, mood, nature walk, wildlife

Introduction

Depression is defined as the state of permanent mood of being sad or unhappy for a long duration of time. It is one of the most prevalent mental problems among all age groups across the world[1] and may exist as a self-limiting illness to a chronic, lifelong illness.[3] The global prevalence of depression is 10%–15%, which is similar to what occurs in India (15.9%) among the general population.[2] If primary health-care centers were taken into account, depression was reported to occur in 21%–84% of the cases in India.[2] A study conducted at the Postgraduate Institute of Medical Education and Research in 2017 indicated that 40% of adolescents had depressive disorders in Chandigarh.[3] To treat depression, clinicians prescribe several types of medical interventions including antidepressant medications and mood stabilizers such as lithium.[4] All these psychotropic drugs impart enormous side effects on the general health.[5] Moreover, the stigma associated with the mental problems worsens the quality of life (QoL) of psychiatric patients.[6] A study conducted by Lin et al.[7] showed that self-stigma is a dominant factor which could reduce the QoL of people with schizophrenia, and patients’ self-esteem can improve patients’ QoL.[7] A recent study has revealed that natural ways such as meditation can enhance the self-esteem of the psychiatric patients and can help in self-stigma reduction.[9]

Nature walk refers to a walk in the natural area containing wild flora and fauna, undisturbed by the anthropogenic means. The nature walk is considered as a live meditation which imparts mental peace in the walkers. Natural environments contain the stimuli which restore brain from mental fatigue and initiate innate emotional, physiological, cognitive, and behavioral responses, which restore the positive state of mind.[9] The level of biodiversity of the natural environment was also reported to contribute to the degree of positivity.[10] More natural habitats (e.g., mountains, forests, woodlands, and valleys) have been found to be associated with greater positivity compared to less natural settings (e.g., parks, gardens, and farmland fields).[11] Positivity was also found to be positively correlated with the number of plant and animal species and habitat.[12]

Studies have revealed that interacting with nature can enhance the cognition in individuals with depression.[13-15] Furthermore, it has been reported that the longer we connected to the nature, the lesser chance will be there for depression.[16]
Therefore, to generate an evidence-based approach, we performed the present study. Under this study, we organize a nature walk in the Chhatbir Zoo, Chandigarh, for twenty participants and the current mood was assessed using the Brief Mood Introspection Scale (BMIS).

**Methods**

**Study type and location**

The present study was a single-centric, blinded, single-group, and single-time point study. The study was conducted at the Chhatbir Zoo (30.6039° N, 76.7925° E), Chandigarh, India [Figure 1]. The study was carried out in July 2018 in the morning time (IST 10:00 AM).

**Participants and study procedure**

Twenty healthy participants, with no history of psychiatric disorders, belonging to different educational and cultural backgrounds, were included in the study. Participants having age > 18 years of either sex were included in the study. Participants were recruited based on an online open invitation to participate in the study which was promoted through social media on the first-come, first-served basis. The BMIS questionnaire was provided to the participants and asked to fill after 2 h of zoo visit. To eliminate researcher-oriented biases, we made participants to fill out the questionnaire by themselves. Further to ensure blinding, we informed the participants that questionnaire is just a survey about the zoo.

**Brief mood introspection scale**

We used the BMIS to study the mood of the participants at the current time point. The BMIS was developed by Mayer and Gaschke in 1988 and is one of the most commonly used scales of mood in psychological studies. The BMIS requires participants to rate their current state of mind according to 16 mood adjectives on a 4-point Likert scale ranging from (1) Definitely do not feel (xx) to (2) Do not feel (x) to (3) Slightly feel (v) to (4) Definitely feel (vv). The BMIS scale has been proven to have good reliability (Cronbach’s α = 0.76–0.83).

The response in BMIS scale can be analyzed in four domains including pleasant–unpleasant, arousal–calm, positive–tired, and negative–relaxed. Positive items in each domain were scored directly (xx = 1, x = 2, v = 3, and vv = 4), whereas two methods are available for scoring of negative items in BMIS, i.e., reverse scoring and subtractive scoring. In our study, we used the reverse scoring in which each item was reverse scored (xx = 4, x = 3, v = 2, and vv = 1). The final score is obtained by the sum of the direct score and reverse score.

For the pleasant–unpleasant scale, positive items (i.e., content, loving, peppy, happy, caring, lively, calm, and active) were directly summed and negative items [Downloaded free from http://www.shbonweb.com on Saturday, November 3, 2018, IP: 10.232.74.26]
(i.e., jittery, sad, fed up, grouchy, tired, drowsy, gloomy, and nervous) were reverse scored. Possible scores range from 64 (extremely pleasant) to 16 (extremely unpleasant). For the arousal–calm scale, high arousal adjectives (i.e., active, caring, fed up, gloomy, jittery, lively, loving, nervous, peppy, sad) were directly summed and low arousal adjectives (i.e., calm, tired) were reverse scored. Possible scores for this scale range from 48 (extremely aroused) to 12 (extremely calm). For the positive–tired scale, positive adjectives (i.e., active, caring, lively, loving, and peppy) were directly summed and tired adjectives (i.e., drowsy and tired) were reverse scored. Possible scores for this scale range from 28 (extremely positive) to 7 (extremely tired). For the negative–relaxed scale, negative adjectives (i.e., fed up, gloomy, jittery, nervous, and sad) were directly summed and relaxed adjectives (i.e., calm) were reverse scored. Possible scores for this scale range from 24 (extremely negative) to 6 (extremely relaxed).\[17-19\]

**Statistical analysis**

The statistical analysis was carried out using GraphPad Prism software version 7.04. The mean and standard deviation of the obtained score from the BMIS scale were calculated. Paired t-test was used to compare the means and \( P < 0.005 \) was considered statistically significant. The final score was also analyzed using the Bland–Altman plot. The arousal–calm score was taken at the average and pleasant–unpleasant score was taken at the difference.

<table>
<thead>
<tr>
<th>BMIS domain</th>
<th>Score (mean±SD)</th>
<th>( P )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleasant-unpleasant</td>
<td>53.29±1.25</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Arousal-calm</td>
<td>29.0±0.44</td>
<td></td>
</tr>
<tr>
<td>Positive-tired</td>
<td>22.53±0.63</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Negative-relaxed</td>
<td>10.18±0.38</td>
<td></td>
</tr>
</tbody>
</table>

BMIS: Brief Mood Introspection Scale, SD: Standard deviation

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**Figure 2:** Mean Brief Mood Introspection Scale score for the pleasant–unpleasant domain and arousal–calm domain (**\( P > 0.001 \))

**Figure 3:** Mean Brief Mood Introspection Scale score for the positive–tired domain and negative–relaxed domain (**\( P > 0.001 \))

**Figure 4:** Bland–Altman plot showing the mean difference of pleasant–unpleasant score to arousal–calm score

**Figure 5:** Bland–Altman plot showing the mean difference of positive–tired score to negative–relaxed score
Similarly, negative–relaxed was taken at the average and positive–tired score was taken at the difference.

**Results**

All the participants in the study had postgraduate level education. Among the total 20 participants, 13 were males and 7 were females, with a mean age of 36 years. All participants were from urban background. The mean score for the pleasant–unpleasant domain was 53.29 ± 1.25 which is significantly high ($P \leq 0.001$) when compared to the mean score for arousal–calm domain which was 29.0 ± 0.44 [Table 1 and Figure 2]. Similarly, the score for positive–tired was 22.53 ± 0.63 which is also significantly higher ($P \leq 0.001$) than negative–relaxed score which was 10.18 ± 0.38 [Table 1 and Figure 3]. In Bland–Altman plot, the horizontal axis shows the arousal–calm score and green dots show the mean difference of pleasant–unpleasant score to arousal–calm score [Figure 4]. In another plot, the horizontal axis shows the negative–relaxed score and green dots show the mean difference of positive–tired score and negative–relaxed score [Figure 5].

**Discussion**

There is growing evidence to suggest that exposure to natural environments can be associated with mental health benefits. The amount of green space in residential areas has been associated with greater happiness and life satisfaction.[20] Studies have revealed that nature walks in urban, public green space downturn the depression by enhancing the stress-ameliorating, restorative experiences and positive mental well-being. In our study, the pleasant score was significantly high compared to the arousal score, which indicates that nature walk inducts a pleasant mood. The positive score in our study was also significantly high compared to the negative score, indicating that nature walk induces a positive state of mind. The results of our study are in consistent with the previous study conducted by Korpela et al.,[21] in which they found that nature walks significantly decrease the depression and potentially increase the positive mental well-being.[21] Feelings of anger, depression, tension, and confusion were found to be significantly reduced after nature walk.[22]

Results of the present study were also supported by the fact that individuals who move to the greener urban area have a significantly good mental health compared to individuals who live in an area where natural flora and fauna is lacked.[20] A study conducted by Bratman et al.[23] reported that in healthy participants, nature walk could decrease the rumination and neural activity in the subgenual prefrontal cortex.[23] Another study suggested that people who do nature walk have lower rates of depression and blood pressure-related problems. It has also been estimated that nature walk of 30 min during a week could reduce the prevalence of depression and blood pressure up to 7% and 9%, respectively.[14]

Although the present article determines the role of a nature walk in prompting positive mood induction, being a pilot study, it has several limitations. Our study lacks the prenature walk assessment which could give more substantial amount of evidence to support the present study results. Another limitation is, being a pilot study, the sample size is very small which could reduce the validity of results on the general population.

**Conclusion**

The present study concluded that nature walk has a significant role in instigating positive mood and possibly can be used as an intervention to manage depression in the general population as well as at clinical level. Being a pilot study, the current work has several limitations, but still our study represents the initial evidence to intervene in nature walk into depression management. A more detailed study with pre-post assessment taking control group into consideration and large sample sizes over a long duration of follow-up could be of paramount importance.

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**Conflicts of interest**

There are no conflicts of interest.

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