Influence of Exercise Environment on Attentional Awareness and Emotional Changes Among Elderly

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ABSTRACT

Introduction: Emotional wellbeing in the elderly is an essential track of the quality of life. The progress of any intervention for the elderly depends on mood characteristics and attention related to cognitive health which spirals further accordingly. In residential aged care and retired home-dwelling elderly attention and mood effect varies with individual and situation from time to time.

Objective: To explore the effects of exercise environment on Positive / Negative mood effect & Attention awareness among elderly without mobility limitation on Indoor versus Outdoor environment.

Methods: 102 literate elderly participants within the age group of 65 - 75 years sedentary and independent were recruited from the general public of Karad, Satara district of Maharashtra. Research environment setting: Outdoor environment was grassland with partly interspersed with trees. The indoor environment is a paved path within the walls or building pathways and not expose to greenery. Measures: Baseline and Posttest measures after 8 weeks adaptation to the exercise environment using PANAS questionnaire to record the scores of positive and negative mood effect and Mindful attention awareness scale (MAAS) to record attention awareness. The participants were made to undergo dual-task activity exercises and mindful walking in their prescribed environment during the 8 weeks of the adaptation period.

Results: The Pretest and Posttest measures have been analyzed and found that the outdoor environment has a significant influence on positive mood effect and improved attention awareness in the elderly.

Conclusion: Emotional wellbeing won’t work upon compulsion and it has to be explored to reach pleasantness.

Key Words: Outdoor environment, Indoor environment, Positive mood effect, Negative mood effect, Emotional wellbeing, Mindful attention awareness

INTRODUCTION

Emotional wellbeing in the elderly is an essential track of the quality of life. The progress of any intervention depends on the mood characteristics of the participants and it spirals further accordingly. In aged elderly, it’s a major feature to be worked upon in a simple way of research. Ageing influences upon attention demands in association with cognitive function interfering with physical activity participation. It’s a common belief that a positive emotional state contributes to confidence and better physical functioning promoting wellbeing on the whole.¹² Attention restoration is influenced by the individual’s adaptation to the environment as per his/her wish and positive or negative mood status gained. So, it is necessary to find out the interrelationship between attention awareness and mood status which directly influences participation in physical activity.³⁴

A sensible and gradual approach whichever is suitable to the elderly will improve the quality of life. Fear of suffering cripples human beings. Any possibility of enriching happiness makes older adults smarter through positive emotions balancing personality traits. Regulation of emotions is influenced by cognitive function resulting in an optimally functional state. Emotional optimism protects older populations against permanent institutional care decreasing functional decline.⁵⁷

Enhancing cognition maintains a balance between existential reality and psychological reality in the elderly which is possible through improving attentional awareness. Attention
and Mood effect directly interferes with physical activity participation and level of performance in the elderly. Also, the personality variables of the elderly may get altered with the environmental stimulus which influences commonsense (Intelligence). The Studies on influences of mood-related life orientation and positive or negative emotion among older people on health outcomes are not common (Ble, Volpato, 2003). The timely mood effect and lack of attention lead to falls and injuries which is a neglected area of research. So, the purpose of this study has been designed to examine the association of Positive / Negative emotions and Mindful attention awareness in older people.

**MATERIALS AND METHODS**

Data was obtained from regular Screening and Counseling for Physical Activity and Mobility in Older People conducted by senior citizens survey in the area. A total of 102 physically independent elderly citizens in the age group of 65 - 75 years who were sedentary but able to move outdoors independently took part in the study. The emotion was analyzed with Positive effect and Negative effect schedule (PANAS - GEN) Questionnaire. Attention was assessed by the Mindful Attention Awareness Scale (MAAS). The study was carried out in Krishna Institute of Medical Sciences, Karad, (KIMS/IEC-043/2011). The study was carried out in Krishna Institute of Medical Sciences, Karad, (KIMS/IEC-043/2011). The Study design is a Pretest - Post-test design done in two groups. Group A participants have undergone mindful physical activity training in the Indoor Environment. Group B participants have undergone mindful physical activity training in the Outdoor environment. In the Outdoor exercise environment, the participants have an opportunity to expose to the green type of scenery amid trees and fields. An indoor exercise environment is a closed environment specifically not exposed to greenery.

**RESULTS**

**Demographic data**

A total of 102 participants were included in the study which consisted of 47 males and 57 females. Group A consisted of 23 males and 29 females. Group B consisted of 24 males and 28 females (Table 1).

<table>
<thead>
<tr>
<th>Group</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>23</td>
<td>29</td>
<td>52</td>
</tr>
<tr>
<td>Group B</td>
<td>24</td>
<td>28</td>
<td>52</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>57</td>
<td>104</td>
</tr>
</tbody>
</table>

The mean age in group A was 68.92±2.8 and Group B was 69.11±2.63. The unpaired t-test analysis showed that the age difference in both groups was not significant (Table 2).

<table>
<thead>
<tr>
<th>Age</th>
<th>Group A</th>
<th>Group B</th>
<th>‘p’ value</th>
<th>‘t value’</th>
<th>DOF</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>68.92±2.8</td>
<td>69.11±2.63</td>
<td>0.7214</td>
<td>0.3576</td>
<td>102</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

**Outcome Measures**

The within-group analysis shows that in Group A the pre-intervention score was 27.30±3.184 and post-intervention was 29.78±3.33 which was statistically extremely significant (p<0.0001). Group B analysis showed that the pre-intervention score was 28.80±4.559 and post-intervention was 32.53±2.44 which is statistically extremely significant (p<0.0001). This was done using a paired t-test (Table 3).
Table 3: Positive mood score: Note: Higher score for positive mood score indicates better results:

<table>
<thead>
<tr>
<th>Group A (Indoor)</th>
<th>Pretreatment</th>
<th>Posttreatment</th>
<th>'p' Value</th>
<th>'t' Value</th>
<th>DOF</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>27.30±3.184</td>
<td>29.78±3.33</td>
<td>&lt;0.0001</td>
<td>8.096</td>
<td>51</td>
<td>Extremely significant</td>
</tr>
<tr>
<td>Group B (Outdoor)</td>
<td>28.80±4.559</td>
<td>32.53±2.44</td>
<td>&lt;0.0001</td>
<td>4.690</td>
<td>51</td>
<td>Extremely significant</td>
</tr>
</tbody>
</table>

The between-group analysis showed that pre interventional there was no significant difference statistically (p=0.0545) but post interventional there was an extremely significant difference in Group B as compared to Group A (p<0.0001) indicating that positive mood score was improved in Group B (outdoor exercise) as compared to Group A (indoor exercise). This was done using the unpaired t-test. Thus, outdoor exercise environments in better than indoor exercise environments.

The within-group analysis shows that in group A the pre-intervention score was 16±3.003 and post-intervention was 14.36±2.90 which was statistically extremely significant (p<0.0001). Group B analysis showed that the pre-intervention score was 14.36±4.559 and post-intervention was 10.36±1.44 which is statistically extremely significant (p<0.0001). This was done using a paired t-test (Table 4).

The between-group analysis showed that pre interventional there was no significant difference statistically (p=0.0057) but post interventional there was an extremely significant difference in Group B as compared to Group A (p<0.0001) indicating that negative mood score was improved in Group B (outdoor exercise) as compared to Group A (indoor exercise). This was done using the unpaired t-test. Thus, outdoor exercise environments in better than indoor exercise environments.

Table 4: Negative mood score

<table>
<thead>
<tr>
<th>Group A (Indoor)</th>
<th>Pretreatment</th>
<th>Posttreatment</th>
<th>'p' Value</th>
<th>'t' Value</th>
<th>DOF</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16±3.003</td>
<td>14.36±2.90</td>
<td>&lt;0.0001</td>
<td>7.013</td>
<td>51</td>
<td>Extremely significant</td>
</tr>
<tr>
<td>Group B (Outdoor)</td>
<td>14.36±4.559</td>
<td>10.36±1.44</td>
<td>&lt;0.0001</td>
<td>9.051</td>
<td>51</td>
<td>Extremely significant</td>
</tr>
</tbody>
</table>

Note: In negative mood scores lower values indicate better results.

The within-group analysis shows that in group A the pre-intervention score was 49.5±3.67 and post-intervention was 62±3.94 which was statistically extremely significant (p<0.0001). Group B analysis showed that the pre-intervention score was 49.88±2.9 and post-intervention was 75.38±4.4 which is statistically extremely significant (p<0.0001). This was done using a paired t-test (Table 5).

The between-group analysis showed that pre interventional there was no significant difference statistically in MAAS score (p=0.5571) but post interventional there was an extremely significant difference in Group B as compared to Group A (p<0.0001) indicating that MAAS score was improved in Group B (outdoor exercise) as compared to Group A (indoor exercise). This was done using the unpaired t-test.

Table 5: MAAS score (Mindful attention awareness scale)

<table>
<thead>
<tr>
<th>GROUP A (indoor)</th>
<th>PRE TREATMENT</th>
<th>POST TREATMENT</th>
<th>'p' VALUE</th>
<th>'t' VALUE</th>
<th>DOF</th>
<th>LEVEL OF SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>49.5±3.67</td>
<td>62±3.94</td>
<td>&lt;0.0001</td>
<td>44.95</td>
<td>51</td>
<td>EXTREMELY SIGNIFICANT</td>
</tr>
</tbody>
</table>
Table 5: (Continued)

<table>
<thead>
<tr>
<th>GROUP B (outdoor)</th>
<th>PRE TREATMENT</th>
<th>POST TREATMENT</th>
<th>‘p’ VALUE</th>
<th>‘t’ VALUE</th>
<th>DOF</th>
<th>LEVEL OF SIGNIFICANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>49.88±2.9</td>
<td>75.38±4.4</td>
<td>&lt;0.0001</td>
<td>42.900</td>
<td>51</td>
<td>EXTREMELY SIGNIFICANT</td>
</tr>
<tr>
<td>‘P’ VALUE</td>
<td>0.5571</td>
<td>&lt;0.0001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘T’ VALUE</td>
<td>0.5891</td>
<td>16.281</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOF</td>
<td>102</td>
<td>102</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEVEL OF SIGNIFICANCE</td>
<td>NOT SIGNIFICANT</td>
<td>EXTREMELY SIGNIFICANT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Higher MAAS score indicates better results.

These results indicate, 1. A pre-test to Post-test results of the outdoor environment is better compared to the indoor environment about Positive (Increased) & Negative Decreased) mood scores. 2. A pre-test to Post-test results of the outdoor environment is better compared to the indoor environment about the Attentional awareness MAAS score (Increased).

The study proves significant results among elderly participants exercising in the outdoor environment with highly significant improvement showing a higher degree of positive mood effect and attentive awareness.

**DISCUSSION**

**Mindful attentional awareness scores**

The outdoor environment is always beneficial in ways like exposure to sunlight and participation in enjoyable activities. The natural environment is found to have a healing effect and reduce mental tiredness among most of the participants in common. The sensory impressions and stimulus received in both indoor and outdoor environments are found to be different. Nature is closely linked with the individual’s identity and behaviour with growth since childhood. The voice of the birds expresses emotion representing freedom. The elderly express their sense of wellness or discomfort in their unique ways which have to be observed properly and to be understood.

**Positive mood scores**

It was found that even the socially deprived participants and the oldest old had a better positive response in the outdoor environment. In comparison, in the Indoor Environment, the participants had less motivation to participate and so resulted in a negative effect with reduced attentional awareness. The subjects were found free to communicate in outdoor and have shown more of physical gestures.

**Effect of outdoor environment**

Maintaining high levels of cognitive functioning is an important aspect of successful ageing and it is related to the attention awareness and mood effect of the individual related to successful training methods. The subjects were found continuing the task out of self-interest and modified as per their convenience in the outdoor environment.14

**Negative mood scores**

Even though intellectual functioning predicts negative effect, morbidity, or mortality, there is no evidence that it predicts a positive effect in aged. A comfortable environment with required socialization has been found better to improve the normalization pattern of their thoughts and feelings improving attentional awareness of their physical activity pattern. It means the suppression of feelings increased stress and restricts attention irrespective of any reason.10,11

It was found difficult to relate intelligence with positive or negative effect as all the subjects were rural elderly with required literacy and similar life status. The mood effect was found changing invariably with each individual which was unexplained among 50% of the participants during the research. It might be possibly due to their likes or dislikes and daily life situations.9,8

The elderly exercising in the outdoor environment was found to have better memory response as they were in contact with nature which provided a sustained positive stimulus comparatively to the indoor environment.14 It was found that subjects had shared their experiences and past or present memories with others in an outdoor environment. This helps the elderly to integrate information and so resulting in better cognitive abilities which are evident through the findings in the research. The participants exercising in an outdoor environment were ready to take up challenging dual-task activities with better progression.

**CONCLUSION**

Results suggest associations between green space and mental wellbeing, particularly hedonic wellbeing. We discovered adequate evidence for associations between urban greenspace and life satisfaction; however, the evidence for the remainder of the green space characteristics, including greenspace (land use) type, accessibility, viewing and visiting
patterns, was limited or inadequate. Psychological or emotional wellbeing won’t work upon compulsion and it has to be explored to reach pleasantness. The study concludes that easier modes of promoting attentional awareness with adaptive situations and activities result in gaining confidence and promoting positive mood effect resulting in elderly wellness. Large, well-designed trials in which the effects of long-term physical activity interventions conducted indoors and out in nature on mental and physical wellbeing are compared in different groups of people are urgently needed. Easily transferable outcome measures (e.g., assessment of the health-related quality of life), administered both immediately after activity and after a period of rest to assess the sustainability of the effects of the activity is also required. Measures to assess the adherence to different physical activity programs should also be included.

LIMITATIONS

A large portion of the variance in different forms of mood effect is unexplained as it passes in the subconscious state among every participant. This mood effect gets transformed with their feelings and thought process and finally, the primary effect is found lost. So an environment providing positive stimulus is advisable to maintain a stable mood among the elderly. Future research is required considering the cognitive, attentional, dispositional, and behavioural factors applicable to mood change and emotional stability of each elderly.

FUTURE DIRECTIONS

The influence on emotional change depends on the intensity of the situation and cannot be handled similarly to all individuals. So, empowering the elderly to cope with their emotional changes and to promote attention is a crucial need.

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Ethical Issue: Ethical clearance was taken from institutional ethical committee, KIMS, Karad.

Funding Sources: Krishna Institute of Medical Sciences Deemed To Be University, Karad.

Conflict of Interest: Nil.

REFERENCES