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## Quality of experience during horticultural activities: an experience sampling pilot study among older adults living in a nursing home

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## ABSTRACT

Horticulture was shown to represent a well-being source for older adults, encompassing the physical, mental and social domains. Aim of this pilot study was to contribute to extant literature through the investigation of the quality of experience associated with horticultural versus occupational activities. A group of 11 older residents of a nursing home were involved in a crossover study with a baseline measure. Participants attended weekly horticultural and occupational sessions for two six-week cycles. Experience Sampling Method was administered before the program and after each session, to assess participants' levels of happiness, concentration, sociability, involvement, challenges and stakes, and self-satisfaction. Altogether, 332 self-report questionnaires were collected.

Findings showed that participants' levels of the cognitive and motivational variables increased during both activities, but horticulture was also perceived as providing higher challenges and stakes, and improving self-satisfaction. Results can have practical implications for well-being promotion among older adults through meaningful activity engagement.

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## Introduction

Research on the fast-growing ageing phenomenon around the world has led to the reconceptualization of old age as a phase in life in which individuals can still play an active role in the community and have a good quality of life, rather than a phase of inevitable decline in human capacity.<sup>1</sup> The World Health Organization (WHO) proposes the concept of active ageing defined as “the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age. It allows people to realize their potential for physical, social, and mental well-being throughout the life course and to participate in society according to their needs, desires and capacities, while providing them with adequate protection, security and care when they require assistance” (p. 11).<sup>2</sup> In the same vein, the positive psychology

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movement has called for the need to catalyze a change in focus on human functioning, from the sole preoccupation with repairing impaired areas of functioning to also building and valorizing personal and social resources.<sup>3</sup> From this perspective, positive ageing entails the optimal interaction of physical conditions, relational resources, positive mental states, and activity engagement.<sup>4</sup>

Both the WHO and positive psychology views on ageing stress the role of activity engagement as a meaningful opportunity for personal skills investment and community participation, and as a contribution to mental and physical well-being. However, activity engagement may be difficult for older adults experiencing loss of autonomous functioning and consequent need for alternative forms of accommodation such as residential care facilities. Life in a nursing home entails changes in living environment and habitual lifestyle.<sup>5</sup> It can engender feelings of abandonment, loss, loneliness, and meaninglessness which can greatly undermine residents' well-being.<sup>5-7</sup> In line with the active and positive ageing views, activities arranged by staff at nursing homes were shown to help preserve continuity with the past and society, to enhance satisfaction and to evoke a sense of homeliness.<sup>5,8</sup> These activities include group exercise classes, cooking clubs, book discussion, arts and crafts workshops,<sup>5</sup> as well as activities related to the natural setting, such as horticulture.<sup>9,10</sup> From this perspective, the present pilot study aimed to contribute to the literature by investigating the quality of experience older adults living in a nursing home associated with a horticultural activity program.

## Background and study aims

Horticultural activities include plant- and garden-related activities which have long been used for therapeutic and rehabilitative purposes in light of the innate closeness humans feel towards nature.<sup>11</sup> Contact and relatedness with nature were generally shown to restore attention,<sup>12</sup> reduce stress,<sup>13</sup> promote pleasant moods and enhance psychological well-being.<sup>14</sup>

Among older adults living in the community, gardening was indicated as one of their preferred activities in everyday life keeping them physically active and providing them with enjoyable experiences.<sup>15</sup> Among older adults in institutions, horticultural activities are particularly suitable as they can be adapted to various levels of residents' physical and cognitive abilities, they can be practiced both outdoors and indoors depending on climatic conditions, and they are also accessible to nursing homes as cost-effective programs.<sup>10,16</sup> Benefits of horticultural programs apply to the physical, mental and social spheres. Horticultural activities were reported to provide physical exercise and sensory stimulation; to increase feelings of calm and relaxation, sense of accomplishment, self-esteem, life satisfaction, sense of responsibility in nurturing plants; and to reduce the perception of loneliness, and enhance social interaction.<sup>9</sup>

Besides this promising evidence, a literature review<sup>9</sup> also stressed some methodological limitations of the studies under scrutiny, highlighting the need for more vigorous quantitative analyses of the benefits of horticulture. Particularly, the majority of studies adopting an experimental design has compared an experimental group performing horticultural activities with a control group leading their usual daily life and activities in the nursing home, thus potentially confounding for the novelty effect associated with the horticultural program.<sup>17</sup> Having a comparison with another structured activity – besides daily life tasks – can help researchers further understand the effectiveness of horticulture, especially its characteristic ingredient, i.e. nature, versus other kinds of still materials.

In addition, useful insights into horticultural activities can be gained by adopting Experience Sampling Method (ESM),<sup>18</sup> a real-time procedure assessing the quality of experience individuals associate with these activities as they are performed. The main advantage of ESM is to reduce the retrospective recall bias characterizing most single-administration questionnaires,<sup>19,20</sup> an advantage that can be particularly useful in the older adult population.<sup>21</sup> To the best of our knowledge, to date the only study adopting a similar procedure was performed by Susan Rodiek<sup>22</sup> to evaluate positive and negative mood and stress levels reported by older adults during indoor and outdoor horticultural programs. In her study, comparisons of pre- and post-test assessments revealed a significant reduction in stress levels during outdoor activities, but no differences in participants' mood in either program. As stated by Rodiek,<sup>22</sup> this finding related to mood may be due to small sample size and high inter-individual response variability. However, it may also be connected to the primary study focus on affective variables, instead of a broader focus on other components of subjective experience encompassing cognitive and motivational aspects.<sup>23</sup>

In light of these considerations, we conducted the present pilot study aimed to investigate the effectiveness of a horticultural program attended by older adults in a nursing home, compared to an occupational program requiring similar manual skills, but handmade materials. For the first time, participants' quality of experience in the two conditions was investigated in real time, exploring the affective variable happiness, as well as relevant cognitive and motivational aspects such as concentration and involvement. Moreover, perceived challenges and stakes in the activity were measured as indicators of the meaningfulness of performed activities, along with perceived sociability and self-satisfaction considered as impor-

tant social and psychological components of well-being.<sup>1</sup> Quality of experience was assessed during regular daily activities in the nursing home, and during the horticultural and occupational programs. In line with available literature, we formulated two hypotheses: (1) both horticultural and occupational activities would enhance residents' quality of experience compared to regular daily tasks, as a result of engaging in a novel activity; (2) the experience associated with horticultural activities would globally be more positive compared to occupational tasks, in light of the intrinsic contact with nature characterizing horticultural activities. Results can have practical implications for health care organizations aiming to support positive ageing through the promotion of meaningful activity engagement for a good life among their residents.

## Methods

### *Design and sample*

The present study adopted a crossover design with a baseline measure to investigate the quality of experience older adults in a nursing home associated with horticultural compared to occupational activities. The choice of this design was primarily based on a) the small number of participants which can take part in group activities under proper guidance and monitoring, and b) the large sociodemographic and clinical variability typical of residents in nursing homes, which makes it difficult to randomly assign participants to comparable groups. In addition, from the ethical perspective, the crossover design offers all individuals the opportunity to participate in horticultural activities, not excluding anyone.

Compared to parallel designs, participants in crossover studies are set in a sequence of conditions rather than one condition only.<sup>24</sup> In the present study, one group of participants first carried out horticultural and then occupational activities, while another group first performed occupational and then horticultural activities. Each individual thus served as his/her control, and comparisons were based on within-subject rather than between-subject variability. This led to overcome problems of group comparability with regard to confounding variables. It also led to the need of a limited sample size to observe the effects of the conditions, as well as to more reliable observed effects. The potential problem in crossover designs is the carryover effect occurring because of the order of conditions presentation. To take carryover effects into account, as suggested by Senn,<sup>25</sup> separate baseline values of participants' quality of experience in the two groups were measured, and consequently used in comparison analyses as described in the data analysis section.

Participants were guests in a private residential care facility in Milano, Northern Italy, which is part of a large European group providing services for older adults. The facility welcomes individuals over 65 years old. It can host up to 208 guests, 54 of which in special care units for Alzheimer's disease. A series of high-quality services are offered, including medical and nursing care, physiotherapy, and psychological support. Services also comprise daily educational activities such as occupational therapy focusing on cooking or healthy behavior; artistic activities such as painting and drawing; cultural activities like watching documentary movies, poem recitals, concerts, and visits to museums or monuments in town.

With the help of the facility staff, a convenient group of 13 guests (9 women and 3 men) was identified by screening available records. Inclusion criteria were: having resided at the nursing home for at least 1 week; and being able to understand questionnaire queries and provide informed consent, i.e. score  $\geq 18$  at the Mini Mental State Examination (MMSE). Exclusion criteria were: having relevant internal medicine diseases (i.e., heart failure or pulmonary diseases such as COPD); being bed-bound; being diagnosed with Alzheimer's disease; to be discharged before the end of the study.

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