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Social farming and educational needs: how kindergarten farms could fill a gap

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Abstract

Kindergarten farms are educational initiatives aiming to reinforce or even create relationships between nature and future generations involving them in agricultural settings. They take the form of Outdoor Education (OE), intending to enhance the outdoor environment in its various configurations, from an educational perspective. From the agricultural side, these activities are included in social farming (SF), represents a union between the educative sphere and the agriculture world and offering added farm revenue with a multifunctional view. In Italy, these educational services within the farms ('Agrinidi' and 'Agrisili') have grown recently, contributing to the educational system where services are marginally available or lacking. This study has focused on the families' needs concerning early childhood services in support of work–life balance; it also investigated their attitudes and interest in OE and in a structured educational service within a farm. To achieve such an aim, a literature study about OE and the educational initiatives within the farm in Italy was carried out. This was followed by an online questionnaire, carried out with 510 resident of a region of Italy (Umbria). The findings indicate high interest in educational services organized in both nature and farms. The statistical and econometric analysis of a subsample of 161 respondents having children under 6 years old has underlined that the attitudes towards OE are affected by specific socio-demographic variables: income and educational levels. In this respect, older participants having a high degree of education and benefiting from a high economic status showed the highest level of preference for OE services. In the conclusions, we underline that developing educational services "Agrisili" and "Agrinidi" can contribute to strengthening the synergy between agriculture and the education sector. They carry out social functions for the creation of collective well-being. They represent a diversification of farm business and a response to citizens' needs for early childhood education in nature; moreover, they push implementation of policies encouraging the birth of these services in rural and peri-urban areas where they are lacking or crowded.

Keywords: Social farming, Kindergarten farm, Outdoor Education, Multifunctional agriculture, Exploratory factor analysis (EFA)

Background

The twentieth-century agricultural industrialization and mainly the green revolution over the last 50 years have determined problems in Western and urbanized societies linked to the nature–man detachment (Garcia-Llorente et al. 2018). Modern populations

are increasingly overfed or malnourished, sedentary, and socially isolated. As urbanized societies disconnected from the land that sustains us and we cultivate, Pretty (2002) argues that we are losing part of our culture and identity.

The situation is more concerned for the children defined as at risk of 'Nature Deficit Disorder' (Louv 2005) and 'overprotected little digital citizens' because they are characterized by a life increasingly confined in closed and reassuring spaces like school, and gym, up to the walls of a 'fortress house'. This increases the risk of childhood obesity, attention disorders, and depressive syndromes (Bertolino and Angelotti 2014).

Against this trend, several studies have demonstrated how significant active exposure is to more natural, greener, and rural environments (Garcia-Llorente et al. 2018). The link with the natural environment assumes particular importance in childhood since the learning process favours personal growth and openness to the social world (Formella and Perillo 2018).

In response to these problems, recently different forms of educational services for children have been established in Italy, such as kindergartens carried out within farms [in Italian: 'Agrinidi' those dedicated to children from three months to three years and 'Agriasili' those dedicated to children from three to six years] or in other natural contexts ('Kindergartens in the Wood' or 'Forest School'). All are traced back to Outdoor Education (OE) which includes a large area of educational practices whose common denominator is the enhancement of the external environment in its various configurations, taken as an educational environment (Monti et al. 2019).

The educational services within farms are among social farming (SF) initiatives. This umbrella term defines all activities where agriculture and rural resources are used with a double purpose, productive and social services (Garcia-Llorente et al. 2018). Combining the productive dimension with the social one, SF can be considered a retro-innovative solution organized at the farm level and in informal environments (Di Iacovo 2020a). This retro-innovative solution was established to meet the changing needs of today's local society that the state and the market are unable to satisfy, both in EU rural and peri-urban areas (Elsen and Fazzi 2021). This use of agricultural resources is considered the basis of the Welfare State's innovative reformulation according to the appropriate socio-economic and environmental approach that needs to be holistic (Barié et al. 2015), as also EU Strategy 2020 has indicated.

Among the SF experiences, these educational services such as kindergartens within the farms contribute to reinforcing or even creating the beneficiaries' relationship with nature (Genova et al. 2020).

SF activities are recognized an expression of the multifunctionality of agriculture (Van der Ploeg, Roep 2003; Dessein et al. 2013). As such, these multifunctional social activities promote farmers' additional income and stimulate economic sustainable development. Moreover, they improve the viability of rural and peri-urban areas by guaranteeing services to people in order also to prevent further depopulation (Bassi et al 2016; Knapik 2018). Among the multifunctionality concepts, SF represents the 'broadening', which describes the development of new on-farm non-agricultural activities that widen the income flows, especially in family farms (Van der Ploeg and Roep 2003; Todorova and Ikova 2014); simultaneously, the services in a non-clinical environment to society that are willing to pay for are supplied.

Recently some said that SF practices go beyond the multifunctional role of agriculture (Moruzzo et al. 2020). This happens if we consider the evolution of welfare systems due both to the reduction in public resources and to the need to provide territorial services of care and social inclusion increasingly effective and increasingly shaped by the person and his needs (Giarè et al. 2018).

In this way, by providing new social services in rural and peri-urban areas to meet existing needs, farms are participating in the construction of i) new models aimed at the direct recipients of services; ii) new strategies for the local development of society, with a positive impact on the welfare system (European Network for Rural Development 2010).

In the case of more structured services such as 'Agriasili' or 'Agrinidi', Italian rural and peri-urban areas can innovate the creation of value by collecting new social questions related to the quality, identity, biodiversity, usability, and reliability of territories (Di Iacovo 2020b).

The SF services, organized by private farms by guidelines established by public institutions, are bought by users directly becoming the transaction object. This has led to the development of quasi-market forms (Milone, and Ventura 2014; Di Iacovo 2020a) that have integrated or substituted the role of the state according to public regulations. Examples are co-therapeutic activities, financed by the users' families, and the new emerging activity of kindergartens services.

The supply of these innovative social/health services requests the competencies they own of each one which is part of a multi-stakeholder group and share them with the common goal of replying actively to society's needs (Di Iacovo et al. 2014, 2017). The farmers are requested new skills to enter these fields of expertise (Gramm et al. 2020); therefore, several farmers consider they couldn't measure up to wage these challenges implementing SF activities (Seuneke et al. 2013; Hassink et al. 2018).

For these social farms that provide 'Agriasili' and 'Agrinidi' services, the challenge is to become embedded in the educational sector; the quality of the educational services in terms of carrying out social functions for the creation of collective well-being depends on the fruitful cooperation between the farm, the municipality, the policymakers in terms of both law support and allocation of public funds, and civil society (Torquati et al. 2015).

Through these activities, the farmers reconnect with local communities and support them (Van der Ploeg and Roep 2003); given the capillary presence of the farms in rural areas, SF increases (or re-creates) the social protection network for users (Moruzzo et al. 2019). In this way, by generating economic activities and social benefits enhancing life quality and sustainability in rural areas, farmers contribute to local and regional progress (Guirado et al. 2017) by guaranteeing services to people and producing ethical products with added social value researched by consumer conscious (Torquati et al. 2019).

This study contributes to the existing literature by focusing on the relationship between SF and educational services, given the possible answers offered by SF activities against the worrying risks due to losing children's connection with the natural environment and all the consequences that derive from it. In general, considering the challenge that farmer pursues to become embedded in the educational sector, we think that individuating specific homogenous groups of potential outdoor educational services clients

and characterizing them could identify these services' demand in depth and design better the supply by farm side consequently.

Specifically, the study aims to investigate:

- the families' needs concerning early childhood services in support of work–life balance;
- the knowledge and the perception of the feasible educational services aimed at early childhood;
- the attitudes and interests both in OE and in a structured educational service within a farm.

Accordingly, in this paper factor analysis was combined with regression and cluster analysis, to better investigate the role of parental individual factors and attitudes as determinants of the choice of outside educational services for their children. Moreover, we also sought to test the hypothesis of the existence of homogenous groups of 'consumers' with similar preferences, to assess the potential for growth of such initiatives.

The paper is organized as follows: section two explains Conceptual framework of OE, focusing on a specific Italian example of OE within the farm: 'Agrinidi' and 'Agriasili'. In section three, we present Material and Methods while in section four we discuss Results. Section five presents Discussion while section six shows Conclusions.

Conceptual framework

Outdoor Education: origin and development around European countries

The term Outdoor Education refers to a wide area of educational practices in which the external environment becomes an educational environment in which children live, experiment with new experiences, and learn.

Developing as a field in the past 50 years, especially in English speaker countries, it is named in the literature also as outdoor environmental education, adventure education, experiential education, and outdoor learning (Turčová et al. 2004).

The literature on the effects of OE on children's development has shown a significant impact on several aspects connected both to the body (Harrington and Brussoni 2015) and mentally healthy (Ewert et al. 2014). Moreover, this educational model also offers an active exchange between the teacher and the children concerning ecology, environment, and nature cycles topics that favour creating environmental awareness using direct contact with the surrounding (Colaci 2018).

The pedagogical orientation of the OE does not define which educational activities should be implemented; all these features are related to the specificity of different educational contexts and the choices of educators. Hence, aiming to reach universal OE definitions risks being inappropriate, since, beyond the linguistic differences, each context presents specific peculiarities (Bentsen et al. 2009).

Specifically, in the Scandinavian Outdoor Kindergartens, there are no indoor activities and children spend almost all the hours during the day in forests or in rural areas, often without a formal playground (Rohde et al. 2023). The German Walkkindergartens have been outdoor schools for young children ages three to six where they stay outside in the woods all day, in all seasons. Playing with what is found in nature stimulates

nurture fantasy play, creativity, and a heightened sensitivity to the earth. In the Denmark Udeskole, the children aged 7–16 participate in compulsory educational activities taking place outside the school buildings on a regular basis (i.e. a day every or every other week); these can take place in nature, local communities, factories, farms, etc. (Turčová et al 2004).

The origin of different OE ideas and their importance in enhancing human growth date back to ancient cultures (Ewert 1989). Successively some philosophers, pedagogues, and psychologists (such as Komenský, Freud, Erikson, or Maslow) have formulated adventure education opinions that have become basics of both adventure education philosophy and experiential learning. The modern OE British approach comes from both the Scouting movement and the pedagogue Hahn; they both differently influenced the OE initiatives that arose worldwide during the twentieth century in response to the urbanization and industrialization process (Lynch 1999).

The new idea of natural education in an organized school space was concretized in kindergarten in the early nineteenth century by the educator Fröbel; it was a place where children between four and six years could learn through play and hands-on exploration strictly in contact with nature. Froebel's ideas inspired both educators (such as Montessori and Steiner) and different currents of pedagogy. Froebel's ideas also facilitated at the end of the nineteenth century the borne of many initiatives which enhance the role of the external environment as a privileged place of informal and formal learning.

At the same time, 'open-air schools' were established in Europe for the medical and rehabilitation treatment of frail and sickly children; there, the external environment was a priority for full clinical recovery (D'Ascenzo 2018).

Currently, has grown an interest in OE as both a recognized complement to traditional classroom teaching (Rickinson et al. 2004) or an available alternative that could totally substitute them. At the same time, many studies concerning OE (Humberstone et al. 2015), environmental education (Stevenson 2007), or the importance of re-establishing a connection between children and nature (Louv 2005, 2011) were published.

The Italian roots of the relationship between child and nature are linked to Maria Montessori at the beginning of the 1900s. She was convinced that in nature the child can find an integral educational proposal. In the same years, the 'Renewed School according to the experimental method' was founded, characterized by nature conceived as a teacher and centre around which all the subjects revolve in a daily way. These experiences over the years became real schools of thought and influenced many pedagogues.

In the mid-1900, Don Lorenzo Milani brought the lessons of the school of Barbiana in contact with nature; founded on the ideals of an inclusive institution, his school aimed to bring all pupils a minimum level of education guaranteeing equality (Bertolino et al. 2017).

In those 1970s, the rural world was characterized by intensive farming which became synonymous with exploitation and environmental degradation, in contrast with what is promoted by the OE. Subsequently, the processes of separation from the rural world did not stop due to the dynamics that characterized it (such as the profitability crisis, employment decrease in agriculture, and progressive abandonment of agricultural land).

A trend inversion was the official recognition of agriculture multifunctionality. Therefore, in strong synergies with other education aimed at change, such as that of food and

consumption, the OE begins to spread and is progressively communicating with the rural world which has become the bearer of knowledge and values finally recognized as important, but it certainly still lacks experience of educational processes and their complexity (Bertolino and Perazzone 2015).

Education in the natural environment is understood and defined in different areas such as environmental pedagogy (Malavasi 2005), environmental education (Schenetti 2015), OE (Bortolotti and Schenetti 2019), up to the most recent definition of OE in nature (Antonietti and Bertolino 2017).

The Italian research strongly confirms the need to bring nature back to the centre of interest and debate on education and psycho-physical health (Schenetti et al. 2015). Therefore, starting from an analysis of the needs of today's children, several traditional childcare services and many public schools are starting to consider the experience in nature as an essential opportunity to respond to the developmental needs of childhood (Bertolino et al. 2017) by activating the redesign of spaces and educational and didactic activities. Moreover, experiences are spreading, such as 'Agrinido', 'Agriasili' (Bertolino and Morgandi 2013), and 'Kindergartens in the Wood'. The 'Kindergartens in the Wood' are characterized by the constant reference to the child's experiences firsthand everything, and in this way, he knows all the facets of nature (Antonietti 2018).

'Agrinidi' and 'Agriasili': an Italian example of Outdoor Education within the farm

The first 'Agrinidi' and 'Agriasili' were born in the early 2000s, based on experiences of agricultural family childcare and originating from the need of women to combine on farms to reconcile female employment and entrepreneurship with having children (Lanfranchi et al. 2015).

Through the years, they are slowly emerging: a recent survey has accounted for 67 in 2022, mainly concentrated in Central-Northern Italy (Borsotto et al 2023). However, there is no national list of these educational experiences within the farms (Antonietti and Bertolino 2017) due to different aspects.

Firstly, in Italy, the legislation both for educational services and SF¹ is regional competence and is in continuous development. Some regions have included 'Agrinidi' and 'Agriasili' services explicitly as part of a review of their law frameworks. In other regions, the legislation doesn't refer explicitly to them, but these activities are comprehended in the regional SF law as activities that a farm could offer. These activities also include compliance with the standards of the authorities in charge.² In this sense, the complicated and new legislative system requires more time to be understood. That's why the spread of these activities has been more successful in the regions that have supported laws to regulate accreditation (National Rural Network 2007–2013 [RRN in Italian] 2009).

¹ In 2015 the Italian national law No. 141 was implemented, providing a framework of principles and procedures for recognizing social farming practices. Four main types of activity were recognized: 1) work and social integration of disadvantaged people; 2) social activities for local communities using material and immaterial agricultural resources; 3) services supporting medical therapies; 4) projects for environmental and food education, biodiversity conservation, and dissemination of knowledge concerning territories.

² The standards of compliance required are, for example, the minimum/maximum receptivity, the service's hours, the existence of a coordinator, the educators' requirements, compliance with current regulations in terms of urban planning, construction, and the safety of plants, equipment, and furnishings.

Secondly, the literature, both scientific and publicists, that involves different competence and sector, from pedagogical one to public welfare, ecology, agricultural economics, is very scarce due to the recent birth and rapid spread of these educational activities in rural areas in Italy (Antonietti and Bertolino 2017).

According to the age of children hosted, several terms defined these activities such as 'agro nests', 'agricultural child nurseries', or 'kindergarten farms' (Lanfranchi et al. 2015; Torquati et al. 2015); other authors use the 'kindergarten farms' term to indicate all these types of services (Dias et al. 2019).

'Agrinidi' and 'Agriasili' are innovative answers foremost to a lack of public/private supply that is unsatisfactory. In mountainous or rural areas with low population density, where early childhood education services are few or lacking, they allow raising children in a continuum with the family environment (Bertolino and Morgandi 2013; Torquati et al. 2015). In the urban and peri-urban areas, where the waiting lists for the pre-existing educational services are crowded, these new alternative structures allow parents conscious of the rural culture to reverse the countryside-city movement.

In fact, in the educational year 2021/2022, 13,518 socio-educational services for children with over 350 thousand places were census in Italy. Of these, 51% are private. These available places correspond to 27.2% of children under 3 years, below the 33% parameter set by the European Union. Specifically, this parameter has been largely exceeded with uniform coverage in some regions while in others, the coverage is close to 30%. In some regions, such as Umbria, the contribution of private structures is crucial offering half of the available places (National Institute of Statistics [ISTAT in Italian], 2023).

'Agrinidi' and 'Agriasili' are also a response to a farm's internal need for economic diversification, income integration, employment, and entrepreneurial activity, especially for women farmers, and a response to a need widespread in the actual society (Torquati et al. 2015; Gramm et al. 2020). Organizing in a farm space all the services normally provided by traditional education facilities (meal, change, rest, etc.), they absorb a noteworthy workload; the extra value that they offer is the more significant time spent outdoors in contact with nature (Lanfranchi et al. 2015). The difference with traditional educational services is given by the place, the presence of animals, the growth of the natural rhythm of the seasons, in contact with the nature and its products.

The offer of more structured SF services such as 'Agriasili' and 'Agrinidi', specific investments, and human and material resources are required; in this case, if the coverage of the costs of the initial investments is supported by the farm itself (with sometimes the public administration involve), the service is directly borne by the families, resulting in a farm economic return.

These initiatives differ from 'Educational Farms' [Fattorie Didattiche in Italian] where school classes go one time or more (but not continuatively) learning information about agriculture; there, however, the youngest could perceive these activities as exceptional events risking creating a gap between the rural environment and the places of everyday life (Montari, 2001).

Instead, day-to-day experience of 'Agrinidi' and 'Agriasili' has a much more profound impact on children (Torquati et al. 2015), supporting the development of awareness in them, which precisely needs continuity and lasting dives (Bertolino et al. 2017).

The optimum place for these activities is the multifunctional farm due to different activities organized and characterized by the traditional farming family structure (Delmanowicz 2017).

Farmers and educators with specific working methods propose lost knowledge and offer the opportunity to have direct experiences, which are fundamental for children's growth as citizens aware of being part of a system. The children observe the farmer's daily work and the responsibility needed to take care of the animals and plants; they acquire sustainable nutrition notions by eating products from the farm and environmental education concepts that they could then report within the family sphere and recognize the importance farmer's role in terms of producer, social services suppliers, and environment defender (Torquati et al. 2015).

In fact, more than other natural ecosystems is the rural context (both for the location that it occupies and for the functions it performs) that highlights human daily bonds with animal and vegetable resources that go far beyond food needs (Bertolino and Perazzone 2015).

From the demand side, 'Agrinidi' and 'Agriasili' respond to a request from families for ever greater environmental quality, as an expression of concern for the effects of modern lifestyles on the health of their children.

Method

Study site and justification

The study was conducted in the Umbria region (Fig. 1). This territorial choice was made because the study was funded by the 2014–2020 RDP of Umbria. The study aimed to identify and implement an educational model aimed at early childhood on the farm that would meet the needs of citizens of the Umbrian territory.

Questionnaire and preliminary statement of sample

Based on a literature review carried out, a questionnaire was defined and used, according to a multidisciplinary group of rural economists and pedagogues of the University of Perugia.

The questionnaire consisted of an introductory part and four sections. The opening part presented the survey, and a box summarized the research topic, clarifying that the term 'Outdoor Education' is an umbrella term that includes 'Educational Farms', 'Agrinido', 'Agriasili', 'Kindergartens in the Woods', 'Outdoor Play Spaces', 'Summer Centres', and 'Educational Services in Nature'. The first section gathered information about the respondents' profiles. The second part focused on the use of the work–family time of the respondents, while the third investigated educational services, in terms of knowledge of them and what characteristics were considered important and used in their choice. The last part collected information about the interviewees' knowledge concerning different services based on environmental–nature education, their opinion about the importance of outdoor stay for children, and what the children might live in terms of experiences, asking for rating the importance of elements according to a five-point Likert scale (from total disagreement at total agreement).



Fig. 1 Map of the study's location

Data collection processes

Between 1 January 2020 and 29 February 2020 (two months), data were collected with a web-based survey using the open-source software application Google Moduli.

The survey was spread through different institutional (the regional educational network coordination, educational associations, and the University of Perugia) mailing lists, sites, and social channels of the Umbria region. A convenience sample of 510 respondents was involved and considered for descriptive data analysis on families' characteristics, needs, and knowledge concerning early childhood in nature educational services. According to the research objectives, a subsample of 161 respondents having children under 6 years old, which could be considered as possible target consumers of OE services, was taken into consideration for the statistical and econometric analysis, as illustrated below.

Statistical analysis

An exploratory factor analysis (EFA) was performed to reduce the dimensionality of the data, while preserving the information variability, and identify unobserved latent factors able to summarize the main households' characteristics and attitudes related to OE services. Subsequently, based on the EFA results, a cluster analysis was implemented to classify the participants. In addition, a linear regression model has been used to further investigate the main determinants influencing the parental choice of OE services.

Individual attitudes and socio-demographic factors were included in the model as covariates to test their influence on consumer preferences for OE services.

Based on a preliminary correlation analysis, a subset of all the variables obtained from the survey process was identified, including only those showing a significant and relevant correlation coefficient.

More specifically, the following seventeen variables have been considered for EFA:

1. Number of sons
2. Mother's age
3. Father's age
4. Mother's educational level
5. Father's educational level
6. Time spent on work (mother)
7. Time spent on work (father)
8. Time spent outdoors with children
9. Parents' opinion about children's needs for contact with nature (calculated as the mean score of the 5-point scale items—Cronbach's alpha of the 5-item scale is 0.586, indicating good internal reliability)
10. Parents' opinion about outdoor experiences (calculated as the mean score of the 5-point scale items—Cronbach's alpha of the 5-item scale is 0.606, indicating good internal reliability)
11. Parents' opinion about the usefulness of outdoor educational experiences (calculated as the mean score of the 5-point scale items—Cronbach's alpha of the 5-item scale is 0.556, indicating good internal reliability)
12. Environmental Association membership
13. Cultural Association membership
14. Consumers Association membership
15. Volunteering Association membership
16. Sports Association membership
17. Economic status.

The implemented EFA allows to explanation of the interrelationship between the observed variables through a linear combination of these latent factors (Hair et al. 2006). For the present study, the principal components method was adopted, using the Varimax rotation method with Kaiser normalization and adopting the Kaiser criteria (eigenvalue greater or equal to one) for retaining factors.

Preliminarily, several pre-estimation tests have been carried out to check for the data suitability for factor analysis. Particularly, Bartlett's test of sphericity was conducted to evaluate the partial correlations between the variables included in the analysis.

In addition, the Kaiser–Majer–Olkin test (KMO) has been implemented to check for sampling adequacy. Then, the factor scores related to the extracted components were used for cluster and regression analysis.

To identify clear and homogenous profiles of OE services consumers, and to aggregate them into groups based on homogeneous characteristics, a cluster analysis was performed (Arabie and Hubert 1994). This analysis was carried out through the following

stages: (a) choice of clustering variables; (b) choice of the metric to measure the distance between the observations; (c) identification of the number of groups using a hierarchical method of clustering; (d) implementation of K-means cluster analysis based on the results of point 'c'; (e) description and interpretation of the final identified groups.

The cluster analysis process was carried out using a two-stage approach. The first stage deals with the implementation of a hierarchical cluster algorithm (Ward method) which, according to the selected metric (Euclidean distance), allowed to identify the number of groups on the base of the resulting dendrogram. In the second stage, a K-means clustering algorithm was implemented using Ward's cluster centres as the initial for the K-means method. K-means is a partitional clustering method that starts assigning cases randomly to an initial partition of K clusters, each represented by a centroid, then moving cases from one cluster to another by reducing the distance of each case from the centroid, using an iterative process. K-means represent one of the most popular non-hierarchical clustering algorithms (Jain 2010; Sarstedt and Mooi 2014), because of its easiness of implementation (Nidheesh et al. 2017). In addition, the results obtained are less affected by outliers and by the presence of irrelevant clustering variables than the hierarchical methods.

As mentioned below, the factor scores of the first component extracted from factor analysis, the one able to explain the greater share of variance, were used in the next stage as the dependent variable in a multivariate regression model. To account for heteroskedasticity, the ordinary least squares (OLS) method was implemented using White estimator to obtain robust standard errors. Diagnostic tests were carried out to check for multicollinearity between predictors (link test), assess the global validity of the model (F-test), and verify the statistical significance of each parameter (t-test) (Cameron and Trivedi 2005).

The estimated OLS model could be formalized as follows:

$$Y_i = \alpha + \beta X'_i + \varepsilon_i$$

where α is the unknown intercept; Y_i is the dependent variable (DV), where i = respondent; X'_i represents the vector of explanatory variables; β is the unknown parameter vector, measuring the effects of the exogenous variables on DV; ε_i is the error term.

The following variables were assumed to be relevant in explaining the postulated relationship and were in the model as covariates: Number of sons, Mother' age, Father' age, Mother's educational level, Father's educational level, Parents' opinion about children's needs for contact with nature, Parents' opinion about outdoor experiences, Parents' opinion about the usefulness of outdoor educational experiences, Environmental Association membership, Volunteering Association membership, Economic status.

All the statistical analyses were carried out using STATA 12 software.

Results

Descriptive analysis

The interviewer's socio-demographic characteristics are presented in Table 1. Of the 510 respondents, 32.4% were between the ages of 31 and 40. 42.4% of the interviewees don't have children. Most respondents live with a partner (58.6%) in the urban area—periphery (39.8%) of the Perugia Municipality (85.9%).

Table 1 Interviewees characteristics

	n	%		n	%
<i>Age</i>			<i>Number of children</i>		
< 21	20	3.9	1	92	18.0
20–30	134	26.3	2	60	11.8
31–40	165	32.4	3	7	1.4
41–50	120	23.5	4	2	0.4
51–60	53	10.4	Not respondent	133	26.1
> 60	18	3.5	<i>Province of residence</i>		
<i>Marital status</i>			Perugia	438	85.9
Unmarried	185	36.3	Terni	72	14.1
Partner	82	16.1	<i>Place of residence</i>		
Married	213	41.8	Urban centre	178	34.9
Separated (informal)	10	2.0	Urban periphery	203	39.8
Legally separated	6	1.2	Rural village	52	10.2
Divorcee	10	2.0	Scattered house	77	15.1
Widowed	4	0.8	<i>Association membership</i>		
<i>Who do you live with?</i>			(Multiple answers are possible)		
(Multiple answers are possible)			Environmental	67	11.9
Alone	39	7.6	Cultural	156	27.6
With partner	299	58.6	Consumers	34	6.0
With children	262	51.4	Volunteering	140	24.8
With parents	133	26.1	Sport	168	29.7
With friends/colleagues	18	3.5	<i>Economic status</i>		
<i>The interviewee is</i>			Low	22	4.3
A person with children under 6 years old	161	31.6	Medium low	235	46.1
A person with children older than 6 years	133	26.1	Medium high	239	46.9
A person without children	216	42.4	High	14	2.7

Table 2 summarizes the socio-demographic characteristics of the 161 respondents that are parents of children under 6 years.

45.3% of them affirmed that they spend usually from 1 to 4 h per day with their children; instead, 42.2% spend more time (from 5 to 10 h) with them.

Concerning the raising of the children, the 161 respondents affirm that they can rely mainly on the other parent, but the family fabric is fundamental in helping the parents: only 8.7% resort to the support of babysitting services.

Knowledge, use, motivation of choice of educational services; outdoors time spent, and the needs of today's children

Among the respondents who have children (294), both under 6 years and those over 6 years, most of them (88.1%) know one or more types of educational services³; among the best known there is the Nursery (for children aged between 3 months and 3 years)

³ In Italy, the educational services are legislated by Administrative Order 13 April 2017, n. 65. Specifically, they are Nursery, Micro-nursery, Spring section, Family nursery, Centre for children, Centre for children and families, Nursery school.

Table 2 Interviewees characteristics—parents of children under 6 years (161)

	Mother		Father	
	n	%	n	%
<i>Age</i>				
20–30	18	11.2	12	7.5
31–40	104	64.6	85	52.8
41–50	39	24.2	55	34.2
51–60	–	–	7	4.3
> 60	–	–	–	–
Absent parent	–	–	2	1.2
<i>Educational level</i>				
Primary or middle school certificate	2	1.2	11	6.8
High school certification	45	28.0	71	44.1
Bachelor's degree	79	49.1	62	38.5
Master's degree or PhD	35	21.7	15	9.3
absent parent	–	–	2	1.2
<i>Occupation</i>				
Freelance professional	24	14.9	36	22.4
Manager	1	0.6	3	1.9
Teacher	30	18.6	5	3.1
Employee	58	36.0	62	38.5
Dealer/artisan	4	2.5	6	3.7
Labourer	7	4.3	25	15.5
Housewife	7	4.3	0	0.0
Unemployed	8	5.0	3	1.9
Other	22	13.7	19	11.8
Absent parent	–	–	2	1.2
<i>How much time do you spend at work?</i>				
Part-time	46	28.6	10	6.2
8 h per day	67	41.6	89	55.3
More than 8 h per day	14	8.7	44	27.3
No timetables	33	20.5	15	9.3
Absent parent	–	–	2	1.2
Not respondent	1	0.6	1	0.6

(96.1%) and the Spring section (aimed at children aged between 24 months and 3 years) (40.5%).

71.4% of 294 respondents have let attend their children at one of the educational services, mostly because they mainly recognize their educational value (55.7%) and because they work (41%). The choice of the educational service among those available was mainly directed by the service's proximity (53.3%) and the knowledge and appreciation of the educational project (49%).

Those who have not decided to take advantage of one of these services affirmed that they did not do it because the family environment is the one most suited to the growth of the children (44.9%) while 18.4% declared that they did not do it for economic problems.

If the respondents had had the choice chance, the Nursery would have been the preferred service (57.1%), followed by the Micro-nursery (which guests generally from 8 to no more than 20) (30.6%).

50.7% of 294 respondents declared that they usually spend their outdoor time in spring–summer while 40.5% affirmed that they do it regularly.

All respondents (510) stated that outdoor time spent produces benefits for children; moreover, most of them say that children mainly express a need for movement, children live a progressive loss of contact with cultivated and spontaneous nature, and they express a need for more relaxed times.

All respondents totally agree with the statement that outdoor experiences can give children moments of observation, socialization, and emotional and bodily expression.

Furthermore, most of the respondents agree that through outdoor educational experiences, children can learn by discovery and acquire the first forms of caring for the environment.

OE in nature and in farms (kindergartens)

67.5% of the total respondents have never heard of OE (Table 3). On the contrary, instead, it is interesting to note that almost all (97.3%) are in favour of early childhood education (0–6 years) in nature.

A high percentage (80.6%) have enrolled their children or would enrol them, in nature summer camps, open-air afternoon workshops, or environmental education centres.

The respondents have divided themselves between those who believe in the benefit of educational services only whether well-planned (52.2%) and who believe that these services can be an overall development (47.6%), independently if they are designed.

All respondents were asked if they had the opportunity to enrol their children or grandchildren in kindergartens carried out within farms: 89.6% of them said yes and most would be willing to travel 10 to 20 km to reach it (56.9%). 51.6% of the total respondents would be willing to pay to let their children or grandchildren attend kindergartens between 150 and 250 euros per month, but there are also those (26.5%) who would also spend between 350 and 450 euros per month (Table 3).

Statistical and econometric results

Factor analysis allowed us to summarize the information contained in the 17 original variables into 7 main components, together accounting for 62.1% of the total variance. Table 4 reports the factor loading values explaining the relationship of each variable with the underlying identified components. The variables showing a loading value higher than 0.40 could be interpreted as representative of the considered factor.

As several original variables showed high significant loadings on more than one factor, the Varimax rotation method was used to obtain easy-to-interpret orthogonal components.

The first extracted component, which represents 12.67% of the total variance, was called 'Attitudes towards OE services' as it is positively correlated with the variables relating to the respondents' opinions and attitudes towards Outdoor Education services: 'Parents' opinion about children' needs for contact with nature' (0.525), 'Parents' opinion about outdoor experiences' (0.593), and 'Parents' opinion about the usefulness of outdoor educational experiences' (0.584).

Table 3 Parents/grand parents' opinions (n. 510)

OE in nature	Questions	Answers	n	% on overall respondents	
	<i>Have you ever heard of OE in Nature?</i>	No	344	67.5	
		Yes	166	32.5	
	<i>Are you in favour of early childhood education (0–6 years) in nature?</i>	No	14	2.7	
		Yes	496	97.3	
	<i>Have you ever enrolled (or would you enrol your child (or grandson) in nature summer camps, Open-air afternoon workshops or environmental education centres, etc.?</i>	No	99	19.4	
		Yes	411	80.6	
Agrisili and Agrinidi	<i>An OE organized in nature or in a rural environment could represent for the children:</i>	A danger	1	0.2	
		An overall development	243	47.6	
		An overall development only whether well-planned	266	52.2	
		<i>If you had the opportunity, would you enrol your son (or grandson) in an Agriasilo or Agrinido carried out within farms?</i>	No	53	10.4
			Yes	457	89.6
		<i>What distance (expressed in km) would you be willing to travel to reach the Agriasilo or Agrinido?</i>	Less than 5 km	159	31.2
			From 5 to 10 km	24	4.7
			From 10 to 20 km	290	56.9
			More than 20 km	18	3.5
			Other (please specify)	19	3.7
<i>What price range would you be willing to pay for Agriasilo or Agrinido service?</i>	From 150 to 250 €	263	51.6		
	From 250 to 350 €	135	26.5		
	From 350 to 450 €	25	4.9		
	Other (please specify)	87	17.1		
<i>Which time slot would you prefer for the Agriasilo or Agrinido service?</i>	from 8.00 am to 12.30 pm (no lunch)	53	10.4		
	from 8.00 am to 14.00 pm	141	27.6		
	from 8.00 am to 16.00 pm	246	48.2		
	from 12.00 pm to 18.00 pm	19	3.7		
	Other (please specify)	51	10.0		

The second component, labelled as 'Age of parents', accounted for 9.97% of the variations and showed high and positive loadings for the variables related to the parents' age: 'Mother's age' (0.611) and 'Father's age' (0.632).

The third component, accounting for 9.54% of the total variance, could be interpreted as a measure of the 'Education and income' aspect, as the variables 'Mother's

Table 4 Principal component matrix

Variable	Attitudes towards OE services	Age of parents	Education and income	Modern households	Participation in environmental and cultural associations	Outdoor time with mother	Volunteering and social attitudes
Number of sons	0.0274	0.1651	0.0096	-0.5063	-0.1204	0.1642	-0.2411
Mother' age	0.0198	0.6114	-0.0174	-0.2698	0.0311	-0.0386	-0.0884
Father' age	-0.0143	0.6328	0.0721	0.1361	-0.0501	0.013	0.0689
Mother' educational level	-0.0295	0.0719	0.5954	-0.0293	-0.0064	-0.0782	-0.0382
Father' educational level	0.0133	0.1658	0.505	0.0624	0.0453	-0.123	0.1001
Time spent on work (mother)	0.0873	-0.0105	0.0137	0.5016	-0.1762	0.017	-0.1792
Time spent on work (father)	-0.0629	0.2858	-0.0484	0.4967	0.1071	0.4286	0.0118
Time spent outdoors with children	-0.0109	-0.0508	-0.0155	-0.0409	-0.0011	0.7572	-0.023
Parents' opinion about children' needs for contact with nature	0.5259	-0.0101	-0.1086	0.0667	-0.0243	0.0846	0.1828
Parents' opinion about outdoor experiences	0.5933	0.0033	0.0698	-0.0087	0.0889	-0.0511	-0.0392
Parents' opinion about usefulness of outdoor educational experiences	0.5849	0.014	0.0156	-0.0143	-0.0488	-0.02	-0.1072
Environmental Association membership	-0.013	0.0305	-0.0677	0.1167	0.717	-0.0841	-0.1481
Cultural Association membership	0.0372	-0.0501	0.0776	-0.1521	0.6408	0.0935	0.1138

Table 4 (continued)

Variable	Attitudes towards OE services	Age of parents	Education and income	Modern households	Participation in environmental and cultural associations	Outdoor time with mother	Volunteering and social attitudes
Consumers Association membership	0.0064	0.0057	-0.0875	-0.2848	-0.014	0.2159	0.567
Volunteering Association membership	-0.0122	0.0229	0.0781	0.1528	-0.0227	-0.1523	0.6842
Sports Association membership	-0.0653	-0.2622	0.4177	0.002	-0.0038	0.1246	-0.1101
Economic status	0.0959	-0.0915	0.4079	-0.0418	-0.0326	0.2856	0.0446

educational level' (0.595), 'Father's educational level' (0.505), and 'Economic status' (0.408) mainly load on this factor.

The fourth factor accounted for 8.42% of the total variance and exhibited strong positive loadings for the variables 'Time spent on work (mother)' (0.501) and 'Time spent on work (father)' (0.496) and a significant negative loading for the variable 'Number of sons'. Hence, this factor was labelled as 'Modern households'.

The variables 'Environmental Association membership' and 'Cultural Association membership' were found to load strongly to the fifth component; thus, this component, accounting for 7.42 of the variation, was entitled 'Participation in environmental and cultural associations'.

The sixth component accounted for 7.17% of the total variance and was found to be highly and positively associated with the variables related to the 'Time spent on work (father)' (0.428) and 'Time spent outdoors with children' (0.757). Hence, this factor could be reasonably interpreted as a measure of the time spent outdoors with the mother.

The seventh component was marked as 'Volunteering and social attitudes' as it mainly contains the items 'Consumers Association membership' and 'Volunteering Association membership', which showed positive correlations with this factor of 0.567 and 0.684, respectively. 6.6% of the total variance was explained from this component.

The results of the OLS model are shown in Table 5. Before proceeding to further discuss the parameters' estimates, a brief description of the post-estimation tests results is provided below. Firstly, the F-test value of 2536.93 and the p-value of 0.000 allowed us to reject the null hypothesis with all zero-coefficient predictors, thus confirming the overall statistical significance of the whole model. No multicollinearity between regressors was detected, as the VIF test resulted in an average value of 1.4, with no variable showing $VIF > 2.13$. In addition, the link test confirmed the correct specification of the model conditional to the dependent variable specification, as the linear predicted value-squared term was not significant.

Table 5 OLS regression model estimates

Parameters	Coef	t-Stat	p-value
Number of sons	0.037	2.37	0.019
Mother' age	0.013	0.64	0.521
Father' age	-0.020	-1.33	0.186
Mother' educational level	-0.063	-4.24	0.166
Father' educational level	0.037	2.74	0.007
Parents' opinion about children' needs for contact with nature	1.091	47.84	0.000
Parents' opinion about outdoor experiences	1.451	42.95	0.000
Parents' opinion about usefulness of outdoor educational experiences	1.167	42.31	0.000
Environmental Association membership	-0.042	-1.29	0.199
Volunteering Association membership	-0.056	-2.41	0.017
Economic status (2)	0.104	1.84	0.067
Economic status (3)	0.242	4.21	0.000
Economic status (4)	0.433	5.87	0.000
_cons	-5.696	-57.78	0.000
Number of obs	161		
F(11, 149)	1840.72		
Prob > F	0.000		
R-squared	0.9934		

Out of the eleven considered explanatory variables, eight were found to significantly affect the respondents' attitudes towards OE services, calculated as factor scores of the first component extracted by the EFA analysis.

Among socio-demographic variables, the number of children, the father's educational level, and, to a larger extent, the household economic status were found to affect significantly and positively the attitudes towards OE.

The respondents belonging to upper social classes with a high degree of education are more susceptible to adopting sustainable 'consumption' patterns, as in our case while by contrast, the parents' age was not found to be statistically significant.

Similarly, the membership in environmental and volunteering associations does not seem to enhance the respondents' preferences towards OE services, as a slightly negative and a not statistically significant coefficient was estimated, respectively.

Instead, the variables related to the parents' opinion about the importance of experiences within the children's education were those exhibiting the higher influence on their attitudes towards OE services, as expected.

To this regard, as the magnitude of the associated coefficient revealed (1.45), the most important driving factor was represented by the parents' opinion about outdoor experiences, followed by the opinion about the usefulness of outdoor educational experiences (1.16) and the opinion about children' needs for contact with nature (1.09).

In Table 6, the distribution of the cases between the four clusters identified from the K-means clustering procedure was reported. Table 7 reports the final centres of the clusters, calculated as the average value of the clustering variables within each group.

The first cluster is the less numerous, accounts for 12.42% of the respondents, and is mainly defined by the first, second, and third components. Concerning socio-economic characteristics, participants in this group are the oldest of the four clusters, show a high degree of education, and benefit from a high economic status. As the negative mean

Table 6 Clusters' distribution

Cluster	Nickname	n	%
1	<i>Aged, highly educated, and strongly interested in OE services</i>	20	12.42%
2	<i>Socially involved, mildly educated, and not interested in OE services</i>	29	18.01%
3	<i>Young, low educated and interested in OE services</i>	47	29.19%
4	<i>Mildly aged, environmental, and social uninvolved and not interested in OE services</i>	65	40.37%
Total		161	100.00

Table 7 Final centres of the clusters

Variables	Cluster			
	1	2	3	4
Attitudes towards OE services	1.542	-0.554	1.138	-1.050
Age of parents	1.815	-0.117	-0.573	-0.092
Education and income	1.316	0.723	-0.456	-0.398
Modern households	-0.189	-0.470	0.125	0.177
Participation in environmental and cultural associations	-0.242	1.771	-0.293	-0.504
Outdoor time with mother	0.113	-0.277	0.617	-0.357
Volunteering and social attitudes	-0.266	0.578	-0.277	0.024

value of the variable 'Modern households' points out, they have, on average, more than one child and free time from work to spend with children. Besides these households do not exhibit a good willingness to participate in environmental and cultural associations and to get involved in social initiatives, they show the highest level of preference for OE services between the three groups. Hence, this cluster was labelled as 'Aged, highly educated, and strongly interested in OE services'.

The second group accounts for 18.01% of the participants. It mainly includes large households, composed of quite young participants with a mildly high education level. These respondents are also very involved in environmental and cultural associations, as well as show a strong attitude towards volunteering and social initiatives. Among the other groups, the participants in this cluster spend the lowest time a work, thus having a lot of free time to spend with their families. However, these individuals do not seem to be interested in OE services and particularly concerned about their children's need for contact with nature, as the negative value of the variable 'Outdoor time with mother' reveals. Thus, this group was identified with the following nickname: 'Socially involved, mildly educated, and not interested in OE services'.

The third group accounts for almost 30% of the respondents, and it is positively characterized by the first and sixth components and negatively by the second, third, fifth, and seventh components. This group includes the youngest participants, who also show the lowest level of income and education among the four groups. These households have, on average, one child who spends time outdoors mainly with the mother, as the father remains at work most of the day. These individuals are not interested in being actively involved in environmental and cultural associations, as well as in social activities;

however, this group shows a good attitude towards OE services ('Young, low educated and interested in OE services' nickname).

Most of the respondents belong to the fourth cluster (40.37%), which is mainly defined by the first, fourth, fifth, and sixth components. These households are mostly middle-aged and show a quite low education degree and income level, although they spent the most time working among the groups. These participants are not involved in environmental and cultural associations and do not seem to be interested in OE services ('Mildly aged, environmental, and social uninvolved and not interested in OE services' nickname).

Discussion

SF is a practical and innovative response to society's needs that many institutionalized social services are not able adequately to provide or cannot anymore, due to the welfare economic crisis, both in rural and peri-urban areas (Di Iacovo et al., 2020a).

In this article, we focused on the families' attitudes and interest in OE and for a structured educational service within a farm. The research first investigated the needs of families regarding early childhood services in support of life reconciliation work and knowledge and perception of possible early childhood educational services. We then focused on attitudes and interest in OE and a structured educational service within a farm.

Umbria Families' attitudes and interest in OE and for a structured educational service within a farm

The results showed that there is a strict need for information about educational services in nature; in fact, on the one hand, the interest of the respondents and their expressed desire to enrol their children in such services is high, but, on the other hand, they lack knowledge of these services considered that a high percentage of the total respondents (67.5%) have never heard of OE. These results confirm the scarcity of knowledge on OE both at the scientific level (Antonietti and Bertolino 2017) and in civil society.

The survey's results show parents' awareness of the importance of time that their children should spend outdoors and of the needs of today's children regarding nature's contact, confirming several studies' results (among others, Kos and Jerman 2013; Mart 2021). These findings also confirm the concerns outlined above: On the one hand, there is a progressive loss of contact with spontaneous nature (the forest, wild animals), and on the other, a real break with cultivated nature (the field, farm animals) (Bertolino and Angelotti 2014; Bertolino et al. 2017). The need and urgency for recovery of contact between children and the natural world (cultivated and spontaneous nature) find strong motivations in terms of well-being and quality of life in relation to Nature Deficit Disorder (Louv 2005, 2011), coined by the pedagogist Richard Louv to indicate a psychological and physical discomfort that affects children in cities who spend a lot of time segregated in closed environments, which causes perceptible defects, reduced attention span in relation to developmental problems, hyperactivity, and other physical and emotional impairments.

Identification of the possible target of consumers of OE services

The statistical and econometric analysis results of the possible target of consumers of OE services have underlined the main individual attitudes and socio-demographic factors influencing the parental (consumers) choice of OE services. These services are mainly preferred by larger families having a high average annual income. Such findings are consistent with those obtained from other authors highlighting that parents' preferences for educational services may be strongly affected by consumer-related socio-demographic characteristics (Stahl et al. 2018).

The parents strongly interested in these services (Cluster 1 and, to a lesser extent, Cluster 3) together account for 41.61% of the total. Comparing the differences between them (Cluster 1—'Aged, highly educated, and strongly interested in OE services' and Cluster 3—'Young, low educated and interested in OE services') emphasizes the main role of income influencing OE preference in the case of young consumers (Cluster 3); the lowest income is the main difference that characterizes Cluster 3 compared to 1.

This outcome is in line with previous research indicating that parents with low income and educational levels attribute lower levels of importance to OE (Ahmetoglu 2019; Wijtzes et al. 2014).

In sound with consumer preference studies focusing on the food sector, respondents belonging to upper social classes with a high degree of education are more concerned about environmental and social issues thus resulting in being more susceptible to adopting sustainable 'consumption' patterns, as in our case.

The higher influence on the attitudes towards OE services is due to the variables related to the parents' opinion about the parents' opinion concerning outdoor experiences, the usefulness of outdoor educational experiences, and the opinion about children's needs for contact with nature.

The clustering results together with the analysis of respondents' preferences regarding OE can support the agricultural entrepreneur in the implementation of these services in the farm and in the identification of the best consumer target to which to turn for its services.

Among the respondents, some underline that the Umbria region lags far behind other Italian regions, where there has been an exponential growth of educational experiences in nature. On the contrary, the Umbria region should have been among the first regions to develop these types of educational services in nature for several reasons: (i) its territorial configuration, characterized by close contiguity between urban areas with peri-urban and rural, (ii) the high degree of multifunctionality of farms, and (iii) the high incidence private services to cover educational childcare demands.

Overall, econometric analysis has thrown up interesting insights on OE demand potential in the Umbria Region, by providing quantitative estimates that could effectively support both farmers and policymakers improving the competitiveness and sustainability of their private and public initiatives for the local development of OE services. In addition, the implemented methodological framework, integrating different robust statistical techniques as well as proposing and validating new evaluation scales based on 'easy to collect' items set, could represent a comprehensive tool to investigate families' attitudes and preferences towards OE services in different context areas.

On the contrary, the main limit of this study is related to the considered non-representative sample, which could affect the internal validity of the estimates. However, given the relatively small extent of the analysed study area and the large sample size, it can reasonably be assumed that the obtained results are sufficiently representative of the Umbrian consumers' target of OE services.

Conclusions

The territorial request analysis concerning the educational childhood need can support the farmers in projecting their education services 'Agriasili' and 'Agrinidi', as we implemented in this study.

The farmers who want to offer educational services within SF are essential actors who, however, must acquire new skills to enter these fields of expertise and provide new educational services to society.

In this way, on the one hand, the needs of the territory can be satisfied and, on the other, the farm's income is increased with a view to multifunctionality.

We would underline that the interviewees' sensitivity towards early childhood education in nature should be related to the timing of the carried-out survey before the world pandemic by COVID-19. If the results of this study have shown a high sensitivity, we are certain that this propensity towards early childhood education in nature is increased post-COVID-19.

This awareness is also based on the results of a study concerning various aspects of the impact of the pandemic on daily life, which underlined that the parents of children attending infant-toddler centres show increased sensitivity to the need for contact with nature, considered important to maintain the psycho-physical balance of both adults and children (Gigli and Trentini 2021). These results confirm the ones recognized widely by nature-based pedagogical theories and already experienced in the educational practices of some schools that practice Outdoor Education, which is now given greater importance by families and presented in this paper.

In conclusion, the promotion of 'Agriasili' and 'Agrinidi' is an effective response related to three different areas: (i) farm business diversification, (ii) citizens' need for early childhood education in nature, and (iii) implementation of policies encouraging the birth of these services in rural and peri-urban areas where they are lack or crowded.

Although the current study was done with an Umbrian citizen sample, the findings appear to contribute to the understanding of society's needs concerning outdoor educational services in general, and structured educational services within a farm (Agriasili and Agrinidi) in particular.

This topic requires further research efforts, considering both several benefits that OE determines in early childhood, and at the same time the opportunity for the farmer to provide new educational services to society increasing the farm income. In fact, the literature, both scientific and publicist that involves different competence and sectors from pedagogical to public welfare, ecology, and agricultural economics remains poorly studied due to the recent birth and rapid spread of these educational activities in rural areas in Italy (Antonietti and Bertolino 2017).

By doing so, the findings from the current study provided insights into the understanding of how OE and the importance of nature are perceived in Italian culture.

Nevertheless, one should be cautious when interpreting these results, as these are not causal direction, and the sample does not represent the whole Italian culture.

Abbreviation

EFA	Exploratory factor analysis
OE	Outdoor Education
OLS	Ordinary least squares
SF	Social farming

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Author contributions

CP was involved in the conceptualization of the paper, ideas, overarching research goals and aims, methodology, preliminary desk research, state of the art, development of a methodological setting, conducting the research and investigation, data curation, formal analysis, writing—original draft, preparation, discussion, first draft, writing—review and editing. BT contributed to the funding acquisition, conceptualization of the paper, ideas, overarching research goals and aims, methodology, leadership of the research activity plan and execution, conceptualization, supervision. MS was involved in the methodology, development of a methodological setting, conducting the research and investigation. AF contributed to the preliminary desk research, state of the art, conducting the research and investigation. LC was involved in the methodology, data curation, formal analysis, validation, visualization, writing—original draft, preparation, discussion, first draft, writing—review and editing.

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Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Competing interests

The authors declare that they have no conflict of interest.

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