Bioaffinity: Generating positive vitality in palliative care
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ABSTRACT
Considering the biopsychosocial benefits arising from human/nature interaction, we questioned how the biophilia hypothesis has been inserted into palliative care. The objective was to map, through integrative review, the historical and scientific conception of the theme, attesting to the contemplation of palliative care principles. Of 1,928 scientific texts, 71 covered the theme, being possible to identify at least one of the nine principles, with emphasis on the integration with psychological and spiritual aspects. Biophilia was applied, above all, to the emotional aspect, and zootherapy, to the relational. However, in view of the limitations imposed on the attendance of biosafety aspects and dependence on volunteers, the insertion of therapeutic horticulture in hospices and pet visits is proposed.

Keywords: Bioethics; Palliative Care; Therapeutic Horticulture; Animal-Assisted Therapy; Vulnerability in Health

1. Introduction
The relationships established between human beings and nature have fostered significant changes in the perception and representation of natural elements throughout their evolutionary course. The relationships, initially instigated by survival instincts, were transposed to domination and control with the advent of agriculture. However, the technological innovations that resulted from this did not extinguish the need for a connection between biotic and abiotic elements that conditioned the homeostasis of ecosystems, thus demanding, after a short period of separation—corresponding to less than 5% of human existence—the gradual resumption of positive attitudes linked to nature[1].

The defense of such conception was pioneered by the American biologist Edward Osborn Wilson, with the publication of the work ‘Biophilia’, defending the mechanism as inherent to living beings, inherited after millions of years of coevolution with other species[2]. Almost ten years later, the Biophilia Hypothesis was promulgated, which substantiated the existence of the human need to relate to nature as a means of promoting biopsychosocial well-being, thus collaborating to the constant appreciation of parks, zoos, gardens, woods, lakes and natural landscapes, as well as the link between these spaces and the feeling of peace and tranquility[3].

The Universal Declaration on Bioethics and Human Rights[4] considers that an individual’s identity comprises biological, psychological, social, cultural, and spiritual dimensions, including his or her relationships with the environment. Therefore, the fact that animals, plants, and landscapes are intrinsically inserted in the relational sphere makes them essential components in the constitution of the identity of human beings,
from the beginning to the end of their lives\(^5\).

End-of-life care remedies numerous hardships inherent in individuals who fall ill, and can significantly impact their emotional and social spheres\(^6\). In 2002, the World Health Organization\(^7\) defined nine principles of palliative care, as follows: (I) promote relief from pain and other unpleasant symptoms; (II) consider death as a natural process; (III) do not hasten or postpone death; (IV) integrate psychological and spiritual aspects into patient care; (V) offer a support system that enables the patient to live as actively as possible until death; (VI) offer a support system for family members during the illness and to cope with mourning; (VII) a multi-professional approach in all stages of care; (VIII) improve the quality of life and positively influence the course of the illness; and (IX) start care as early as possible.

In the practice of palliative care, the preservation of the dignity and integrity of the patient constitutes a priority, instilling respect for the person in his fullness, including his life values. For this, such practice intends to keep him connected to what has meaning and value in his life, even in the face of a sequence of losses\(^8\), considering the ecological values of the person as a fundamental right and intending to maintain his dignity\(^5\).

The use of nature as a component of metabolic maintenance is intrinsic to all heterotrophic living beings, whose intermediation of evolution led to the selection of certain elements for the restoration of biological processes, inserting the relationship of the therapeutic action of minerals, plants and animals\(^9\). In this context, Fischer et al.\(^9\) reflected on the ethical issues involved in the use of zootechnical animals as a global practice rooted culturally, but congregating a plurality of moral and vulnerable agents. The authors questioned the limits and care involved in deciding how and when to use animals as medical resources. Fischer et al.\(^10\) also analyzed zootherapy from a bioethical perspective, listing, in addition to the inherent benefits, the vulnerabilities that can be generated if the practice is not mediated by bioethical principles.

The first reports of the use of animals for therapeutic practices date back to the early 18th century, when European hospital patients with mental disorders were allowed to walk around and care for gardens and domestic animals\(^11\). In the 1960s, Boris Levinson, a North American child psychiatrist, developed animal-facilitated psychotherapy to treat behavioral disorders\(^12\), and was followed by other researchers who associated benefits to pets in helping in the treatment of chronic patients\(^13\), culminating in the re-registration as a therapeutic tool\(^14\). In Brazil, reports of the use of animals in the psychiatric therapeutic context began in the 1940s, with the work developed by Dr. Nise da Silveira (Pedro II Psychiatric Center, Rio de Janeiro) standing out. There was also the officialization of Animal-Assisted Therapy (AAT) in 1997 with the implementation of the philanthropic project Pet Smile, by psychologist and veterinarian Dr. Hannelore Fuchs\(^12\).

In view of the legitimacy of biophilia attested by different researches evaluated by Kellerte Wilson\(^3\) and Irvine and Warber\(^15\), the present study questions the feasibility of promoting the interaction of palliative care patients with natural elements in the hospice environment. To answer this question, the following hypotheses were tested: (1) the presence of natural elements at a time of high vulnerability is recognized by science as capable of providing benefits in the biopsychosocial sphere of individuals; (2) there is little evidence to promote the interaction of palliative care patients with natural elements due to the belief of its inefficiency as a therapeutic measure, given the brevity of the interventions; (3) even considering that the interaction with nature foresees contact with various elements, such as plants, water, landscapes and fruits, it is believed that there is a prevalence of scientific dissemination in Animal-Assisted Interventions (AAI), especially dogs.

Thus, the objective was to analyze, by means of a quantitative and qualitative integrative review, the effects of the contact of elements of nature with patients without curative therapeutic possibility. The results of the research aim at unveiling new visions and conducts in relation to methods based on biophilia, with the intention of softening and valuing the end of life of those who are under palliative care. They were analyzed according to bioethical principles of identification and mitigation of vulnerabilities in situations of conflict. Thus, it was aimed to
establish a co-communication channel between moral agents and patients, enabling solutions based on common values, with the mitigation of suffering and the valuation of life in all its manifestations.

2. Methods

The present study constitutes a quantitative and qualitative analysis of an integrative bibliographic review\[16\] in the national and international scientific scenario, having as its guiding question the applicability of natural elements in patients under palliative care, as well as the vulnerabilities involved in order to promote a reflection in the light of bioethics.

The academic contextualization took place through a survey of scientific texts published in the digital media, which had as their guiding axis the interaction of patients with no possibility of curative therapy with elements of nature.

The texts were retrieved through the search engine Google Academic, in the period from August to November 2017, and the results were obtained and analyzed according to two perspectives. First, intending to the mapping of the relationship between biophilia and patients in palliative care, using the descriptors and their respective records in the search engine: “palliative care and biophilia” (N = 2,304); “terminal patients and biophilia” (N = 242); “end of life and biophilia” (N = 658); “incurable diseases and biophilia” (N = 497), in Portuguese and English, using the same in the singular and plural.

The second step aimed to analyze the use of activities involving animals: “Animal therapy and terminal patients” (N = 715); “animal therapy and palliative care” (N = 813); “animal therapy and terminal patients” (N = 209,500); “animal therapy and palliative care” (N = 52,410); “animal interaction and palliative care” (N = 7,070); “animal interaction and terminal patients” (N = 26); “animals and palliative patients” (N = 14,699); and “animals and terminal patients” (N = 3,790).

For each descriptor, the first 100 results were retrieved and categorized according to location, audience, animals and elements used, and origin of the intervention. Results that did not contain the desired content were excluded, as well as those that were duplicates. The quantitative analysis tested the homogeneity of the sample, comparing the parameters tested (elements, benefits, and limitations) according to the variables (national/international), based on the null hypothesis of occurrence in the same proportions, measured by the Chi-square test, considering a 95% confidence and 5% error.

The qualitative analysis was carried out only in the specific content, five articles being related to the term biophilia and seven to zootherapy, aiming, by means of the semantic technique of Bardin’s content\[17\], to list the convergent and divergent points presented in the studies. The analysis was guided by the theoretical aspects of the Biophilia Theory\[2,3\], and the principles of palliative care\[7\].

3. Results and discussion

3.1 Biophilia and zootechnics in the palliative care hospital environment: Quantitative analysis

The scientific content related to the characterization of biophilia in the context of assistance to patients in palliative care resulted in nine terms in total contemplation, since the results encompassed less than one hundred contents, covering 78% of analysis of the returns indicated by the search engine. A total of 751 texts were retrieved, and after excluding those that did not present content related to the interaction between biophilia and palliative care, as well as the duplicates, 3.7% (N = 28) were left. Of these, 93% brought contents related to the hospital environment, prevailing the use of the ecological garden, plants and dogs, aimed at a general audience and emotional benefit (Figure 1).

The scientific production associated with animal therapy and patients with no chance of cure resulted in seven terms covering the entire sample, culminating in a coverage equivalent to 45% of the analysis of the results. A total of 1,177 references were retrieved, and after exclusion, 3.6% of the texts remained (N = 43). The interaction of patients with AAI volunteer animals was identified in 68.7% of the results, associated with some Non-Governmental Organization (NGO), and only 31.2% of patients received visits from their pets (Figure 1).
Figure 1. Synthesis of the quantitative integrative review on the insertion of biophilia and zootechnics in the hospital environment; in national (N) and international (I) scientific texts.

Note: The homogeneity of the categorization results was tested using the Chi-square test, with significantly higher values \((p < 0.05)\) highlighted in the dark box.

Source: Authors.
The data obtained in the quantitative analysis contradicted the expectation of the hypothesis of prevalence of dogs in assisted activities in terminally ill patients, highlighting the use of ecological gardens. However, it is noteworthy that it is still associated with practices developed in the international scenario. The present study evidenced the initial hypothesis of the biopsychosocial importance established through the contact between patients and natural elements, revealing positive aspects in practically all the spheres analyzed, with greater evidence when related to the emotional. This corroborates Muschel’s research\[18\], involving patients in the final stage, which attested to the reduction of feelings of despair, loneliness and stress caused by the proximity of death, due to the presence and tactile stimulation of an animal, reaching the expectation of care not necessarily linked to the cure\[19\].

### 3.2 Biophilia and zootherapy as therapeutic practices in palliative care: Qualitative analysis

The qualitative analysis associated with the insertion of biophilia as a therapeutic practice in palliative care attested 57.1%, referring only to citations, and half of those that dealt with palliative care as one of the main approaches corresponded to case reports or practical experimentation, and the other was limited to theoretical reflections. Most of the recovered content associated with animal therapy consisted of theoretical research (55.8%) and addressed the topic in a superficial manner. Of the specific studies, 13.9% dealt with theoretical reflections. Among the institutions that allowed animal visitation, the intermediation by volunteers was predominant (81.3%), while 18.6% of patients had the opportunity to interact with their pets (Figure 2).

**Figure 2.** Synthesis of the qualitative analysis of the texts retrieved, addressing the insertion of biophilia and zootherapy in palliative care, and quantification of the texts that meet the principles of palliative care.

Source: Adapted from the references\[18,20,24-32\].
The texts directly associated with biophilia in the context of palliative care brought two approaches: clinical interest (64.3%) and architectural interest (35.7%). Both addressed biophilia as a fundamental aspect in the quality of life of patients, families and the therapeutic team (Figure 2).

The contents of the medical-clinical approach focused on therapeutic aspects of biophilia, promoted by the interaction with animals, plants, and gardens, the latter two being the most frequent. The benefits associated with AAIs corroborate the evidence associated with improved self-esteem, depression symptoms, and quality of life[10]. Other studies have brought novelties, such as therapeutic horticulture, reported by Wallis and Lenon[20] as a non-medicated intervention in which palliative care patients can support each other.

The approach inherent to architecture has shown a focus on the benefits achieved by biophilia, mainly from the contemplative aspects, and on the promotion of salutogenic environments for the improvement of health and well-being. Erickson[21] related Roger Ulrich’s theory of Healing Gardens[22] as a potential health benefit for patients in general. According to the theory, immersion in healing gardens promotes social support, privacy, options and places for private moments, as well as stimulating physical movement, which is key to rehabilitation, and distractions through plants, flowers, water, wildlife, and sounds of nature. Dalton and Harrisson[24] also highlighted the “congruence principle” and the “salutogenic model theory” in design, justifying that the lack of a coherent living space (without congruence) can lead people to become ill. The authors presented a proposal for a “customizable room” that would optimize the congruence between users and a healthy environment, contemplating biophilic aspects.

In all the texts analyzed, it was possible to identify benefits of bringing patients closer to natural elements, corroborating the hypothesis tested in this study and associated with the Biophilia Hypothesis[3], pronouncing those of an emotional nature, followed by social aspects and linked to quality of life. Interaction with animals, especially dogs, was more related to social benefits, of the relational sphere, such as decreased loneliness, aid in communication, and social behavior[33]. On the other hand, interaction with ecological gardens was related to emotional benefits, such as mood improvement and reduction of stress and depression (Figure 2).

Queiroz[34] reported that most patients participating in their study lived with pets. While Wallis and Lenon[20] depicted that patients who had gardens in their homes, but went on to live in hospital beds, reported that they would love to be able to go outdoors again. According to the authors, a dying patient in palliative care, who had earlier planted a watercress seed, smiled as he smelled the fragrance of the plant that was held under his nostrils[20,25]. However, even in the face of data that attest to the effectiveness of the practice, there are limitations to the insertion of gardens in hospitals, which can be logistical, such as the need for maintenance and therapeutic teams, the need to attend to displacement, and also the increased risks that a garden can provide, such as the approach of insects and animals such as ants, flies and pigeons, which can potentially increase the biosecurity risks in hospitals[35].

AAIs are practices that have been implemented worldwide as humanization measures in hospital settings, with predominance in the public sector, including palliative care. Engelman[36] used animal therapists in a palliative care outpatient clinic for one year and found that patients became happier and more stimulated, reducing negative emotions mediated by the verbalization of good memories. In general, they felt relaxed and mentioned that the animals brought them comfort in facing their illnesses. The improvement in the quality of life of patients in palliative care was confirmed by Turnbach[32], emphasizing that the benefits go beyond the patients, promoting a positive anti-stress experience for the therapeutic team and family members. Corroborating these data, Muschel[18] developed a study with patients in oncologic treatment, for whom the presence of animals constituted stress-reducing resources. Although the results of AAIs are still questioned as to biased analyses, receiving severe criticism on the methods of analysis, besides the constant allegation of theoretical emptiness[37], it can be noticed that, in general, they arouse positive feelings in patients, including those without curative therapeutic possibility[28].
In the articles analyzed, the study Pet therapy with terminal cancer patients’, authored by Irene J. Muschel, an American activist who seeks to rescue concepts of animal care, was recurrently cited. In the article, Muschel interviewed patients with advanced incurable diseases, weekly exposed to dogs for an hour and a half, during ten weeks. The presence of the animals fulfilled psychological and social needs of the patients, which until then were impossible to be met. One highlight was the decrease in feelings associated with fear, despair, loneliness, and isolation. In addition, it helped in the acceptance of feelings related to the inevitability of death. The patients who participated in the research by means of a questionnaire indicated that the presence of the animals diminished the feeling of helplessness, so they constantly clamored for their presence. The correlation between reduced loneliness and animal guardianship was also recognized by the author as beneficial in determining the quality of life of the patients.

In the context of animal therapy, two referrals were identified: animals from volunteers and animals from patients. While the former clearly promotes the socialization of the patient, the case of interaction with one’s own pet promotes introspection and internal dialogue. In the therapeutic context, for patients in general and even for the non-hospitalized elderly population, children and incarcerated, both approaches are attested as beneficial for overall health, highlighting the possibility of psychological comfort promoted by physical contact devoid of judgments and social constraints. However, in the context of palliative care, the opportunity to elaborate the moment of finitude has a significant relationship when the process of contact is made with the animal itself.

Although zoo therapy is recognized as an efficient practice of interaction between humans and animals, institutions list a number of operational limitations, especially regarding the increased risks involved with biosecurity, even in the face of insufficient studies on the exposure of patients and animals to possible zoonoses and pathogens. For Murthy, Pandrangi and Welber, the results obtained so far are based on case reports and outbreak investigations and therefore cannot effectively measure the possibility of risk to the involved. Added to this is the argumentation of researchers in the field of Animal Welfare (BEA), who claim for ethical conduct and standardization of the use of animals, even if some vulnerabilities are listed, such as the exhaustion of these, due to many hours of work; increased anxiety, due to exposure to odors and different places; incompatibility of physical and psychological characteristics of animals to the practice; lack of consolidated protocols compatible with reality; involving certified and standardized training; and, mainly, the difficulty in dealing with these limitations due to the emotional load linked to the justification of the use of the animal involved in the solitary work.

Although protocols for animal therapy already exist in many countries, in Brazil, the regulation is left to each institution, being predominantly conducted by the third sector.

3.3 Biophilia and zootechnics: Congruence with palliative care principles

In all the texts resulting from the integrative review, it was possible to identify one or more principles of palliative care (Figure 2).

Principles I, IV and VIII, which intend to relieve pain and other unpleasant symptoms, including those related to psycho-social and spiritual factors, aiming at improving quality of life, were identified in 18, 40 and 44 articles, respectively. These results attest that non-pharmaco-logical measures help these purposes, as they tend to transform the hostile climate, related to illness and proximity to death, into a relaxed and pleasant environment. Starting from the conception of pain as a subjective process and plausible of interferences of individual characteristics and of the emotional and spiritual state, it is conceivable that the interaction with another living being interferes positively, as attested by Varas, who registered a perception of pain up to four times lower in the patients involved.

The presence of the animal and of other natural elements promotes a change in the self-centeredness and increases the willingness to communicate, easing the patients’ feelings of pain, fear, anguish and depression, improving their mood and self-esteem, and decreasing their aggressive behavior.
Some patients felt connected to the animals\textsuperscript{[28]}, because, from an emotional perspective, their presence promotes comfort, since it is not authoritarian and offers no judgment, at times when, many times, relatives avoid talking about imminent death, as a way to protect themselves from suffering. To this, the patient adds the feeling of responsibility and care for the other, and of being loved and important to the other\textsuperscript{[48]}.

The improvement of the quality of life of the patient in palliative care demands the contemplation of the human being from a holistic approach\textsuperscript{[8]} and ecological\textsuperscript{[5]}, constituting the integration with the natural world as a vital part of the biopsychosocial and spiritual well-being of the individual\textsuperscript{[15]}.

Principles II, III, IV and IX aspire to promote the affirmation of life, and the conception of death as a natural process, valuing every moment that can still be lived as actively as possible, seeking ways to not accelerate or postpone death\textsuperscript{[46]}, having as a challenge the overcoming of the fine line between doing and not doing\textsuperscript{[43]}. These were identified in 8, 2, 15 and 5 articles, respectively. The use of natural elements in this process promotes the rescue of positive feelings, often difficult to be established with/among family members or friends, because the need to elaborate the last moments of life involves tension, fear and insecurity in the face of imminent death, which may compromise the quality of this period\textsuperscript{[28]}.

Similarly, contemplation of landscapes and interaction with animals and plants during seasonal changes, in addition to the very identification of death in nature, inserted in the short or long natural cycles, and the understanding of the end and the new beginning, may be the determining factors for the acceptance of death as a natural process, as evidenced by Wallis and Lenon\textsuperscript{[20]} in the practice of therapeutic horticulture. This practice was reported by Leckie and Pilgrem\textsuperscript{[27]} and Wallis and Lenon\textsuperscript{[20]} as beneficial for patients in palliative care by promoting life affirmation and preparation for death, without necessarily having the imminence of it permanently present. The authors reported cases in which the cultivation of vegetables was performed at the bedside of the patients, providing them, until the last moment, the opportunity to collaborate with the continuity of life. The enchantment in front of another living being can incite movements, detain attention and communicate this to others, such as the increase in cognitive alertness level in pediatric palliative patients recorded by Varas\textsuperscript{[46]}.

For Lima and Sousa\textsuperscript{[38]}, the social benefits are in the destituation of conceptions, making the patients not bothered by their own physical and mental limitations, allowing them an approximation with others and developing in them the confidence to perform activities that demand motor coordination. This goes beyond an intention to simply prolong life, but aims to provide quality of life and well-being, preserving identity through the insertion of the ecological dimension of the subject in the aspect of re-signification of life and the re-presentation of what it is to be alive\textsuperscript{[8]}.

The promotion of alternative therapies, such as growing plants and interacting with animals, or simply awakening the fascination for trees, rocks, plants, and other components of wildlife can raise the spirit to another level of contemplation, providing a sense of being far away and transcending the plane of illness\textsuperscript{[3]}. According to the manual of the National Academy of Palliative Care\textsuperscript{[49]}, the early approach allows for the prevention of symptoms and complications inherent to the underlying disease\textsuperscript{[43]}, which are supported by interventions with alternative therapies such as horticulture, gardening, or AAI\textsuperscript{s}, primarily of an emotional order\textsuperscript{[20–22]}. Principles VI and VII institute assistance to family members during the illness and in coping with mourning, and the co-participation of patients, family members and professional team in the palliative care process\textsuperscript{[18]}, being identified in 10 and 17 articles, respectively. Lima and Sousa\textsuperscript{[38]} pointed out that animals, besides providing conditions related to support, companionship and comfort to patients, are capable of positively impacting family members and professional teams, who are also in periods of emotional vulnerability. These results were attested by Varas\textsuperscript{[46]}, related to guardians of children under palliative care, and by Turnbach\textsuperscript{[32]}, in the quality of life of family members and caregivers during the period of acceptance of the disease, since there was improvement in the support and facing of the situation. Erickson\textsuperscript{[21]} reported that hospice gardens provide
more welcoming and comforting environments for family and patients to interact. The reserved areas offer privacy for meditation and reflection in the contemplation of nature, sometimes fundamental in coping with grief. It is noteworthy that the patient’s animal and/or a plant he/she grows represent, for the family member, a link that keeps him/her alive in other beings, who carry his/her existence, which may be rescued, bringing comfort and, unquestionably, legitimating the practice of humanization in palliative care. All this brings up the need for interdisciplinary approaches that access not only the clinical needs of patients, but also their psychosocial and spiritual needs, as well as those of their families.

The presence of the natural element makes it easier for the patient to express his fears, feel more confident to talk about his situation and, thus, approach subjects with the medical team and family members, perhaps never before mentioned. Muschel identified that the presence of animals made professionals and family members more relaxed, with less discomfort when facing situations, as it allowed the sharing of positive memories. Therefore, Kawakami and Nakano reinforced the need that AAI and other biophysical therapeutic interventions be shared and built together with the therapeutic team, so that it can insert itself in the context, be able to evaluate the consequences of treatment and collaborate with the efficiency of the technique. It must be emphasized that, in the hospital environment, the patient spends more time with the medical team than with the family members. Automatically, the success of interventions in palliative care must foresee a welcoming of the professionals. According to Matsumoto, the family—both biological and acquired, including friends, partners, and the pets themselves—can and should be partners and collaborators in the care, because the comfort and emotional support provided can be as significant as the medical support. Therefore, the visitation of the patient’s pet may find argumentative support in principles (6) and (7), as they provide support to the family when they legitimize keeping the patient connected to everything that gives meaning to his life, corroborating Bertachini and Pessini’s argument, that preserving the patient's identity is a priority in palliative care.

### 3.4 Mitigating vulnerabilities: Promoting biophilia in hospice as an ethical means of palliative care

The main limiting factors for the practice of biophilia in hospital settings referred to biosafety issues plus logistics for its maintenance. Given the legitimacy of this argument and the positive results reported in the literature, we propose the promotion of biophilic therapies in hospices as an ethical means of promoting palliative care.

Death, throughout human history, has been associated with bad and uncomfortable feelings, resulting in lonely patients, with weakened autonomy and unable to see meaning in their existence. However, this is a concern that has existed since the Middle Ages, when monasteries offered hospitality to the hungry, poor, orphans, lepers and the dying. The movement called Hospice Philosophy, originated in England, in the 20th century proposed to minimize this vulnerability by means of humanized care, whose practices went beyond diagnosis, treatment and prognosis, aiming at holistic care, involving the physical, emotional, social, spiritual and, more recently, financial, interpersonal, family and professional team spheres.

The palliative care model began to be debated and implemented in Brazil only in the early 1980s, however, the methods were based on essentially curative health care, and only took place in the hospital environment. Rodrigues and Zago reported the movement, adapting the Hospice Philosophy to the Brazilian reality, overcoming the conception that there was nothing to be done for terminally ill patients, in function of the conviction that much can be done, based on the principle that, while there is life, there is the possibility of care. In the context of palliative care, feelings of empathy and compassion are fundamental for people who are in states of terminality of life and vulnerable in the face of physical, emotional and existential changes. Thus, hospices are designed to be resting places, invoking comfort and the feeling of being at home, achieved, according to Erickson, with the existence of beautiful gardens, for example. According to the author,
patients well accommodated in movable beds enjoy nature without losing the comfort or assistance of their beds, favored by the fact that the senses of hearing and smell, amply stimulated by the garden, may be the last to disappear. Similarly, solitary places for meditation and contemplation of nature are assumed, as well as places for small groups of family members to gather and talk [21]. Porches, balconies, verandas, and atriums promote a cozy feeling, and ease the transition between being inside the facility and being outdoors [21]. According to Sadler [54], when available, the garden is a safe and secure refuge that usually surrounds the building structure, offering a wonderful view for patients. Such gardens are mentally restorative experiences for patients, families, and staff, who spend a lot of time in these institutions. The architect Ulrich [55] has pointed out that there is considerable evidence that the restorative effects of contemplating nature are manifested within three to five minutes through a sequence of physiological changes. Considering the psychological/emotional aspect, nature or garden observations raise levels of positive feelings and reduce negatively toned emotions such as fear, anger, and sadness. Certain nature scenes effectively sustain interest and attention, and consequently serve as pleasant distractions, which can decrease stressful thoughts. As for physiological manifestations of recovery from stress, laboratory and clinical research has attested that contemplation of nature can also produce significant restoration in less than five minutes, such as improvement in blood pressure, heart activity, muscle tension, and brain activity [55].

Numerous institutions already stand out in the international scenario for implementing gardening and horticulture programs, in which patients monitored by multidisciplinary teams - composed of horticultural therapists, psychologists, nurses, and physical therapists—plant seedlings that will be given their names and transplanted to the garden [56]. The fear of finitude is the greatest barrier faced in the process of elaborating the acceptance of death, and transposing existence into a plant can be considered a humanizing practice, since it brings a sensation of continuity. The same mechanisms are perceived by the family members, who see, in the tree planted by their loved one, the flow of life. This practice, avoided in hospitals that excel in biological safety, finds in hospice an ideal place to be developed. The practice of gardening as an adjuvant in therapeutic processes, which aim at a better quality of life, is already observed [54]. Erickson [21] transposed the amplitude of this millenary practice by suggesting the presence of therapeutic gardens in palliative care hospitals, as some patients could enjoy time outdoors, even when bedridden.

Therapeutic horticulture, although documented in the literature, is a relatively new proposal in hospices, requiring adaptations to the needs and limitations of patients, and is often performed suspended on tables and in pots [21], or even at the head of the beds [20]. According to Leckie and Pilgrem [27], and Kumasaka et al. [47], this practice is a means to increase quality of life by alleviating suffering and symptoms of dementia; reducing pain perception; improving mood, cognitive, motor, and speech skills; and promoting rehabilitation, allowing patients to live fully to the last days of their lives [27].

3.5 Mitigating vulnerabilities: The visit of the patient’s pet as an ethical practice in palliative care

With regard to animal therapy, the emerging question is whether there are differences in the visits of volunteer animals and pets. Considering that 44% of Brazilian families have pets [57], it attests the space that is destined to them within the families. Therefore, the value of this affective bond must be considered in the care of patients in palliative care. Among the countless benefits, the relationship based on donation and free of judgments, prejudices, and stigmas stands out, added to the fact that the animal provides the physical contact so necessary for the biopsychosocial [12] and spiritual well-being of the patient. Illustrating this situation, Rocha [58] described the desire of a young patient, in terminal stage of life, to receive the visit of his pet, claiming that, in the hours he was alone, the animal was his only and inseparable companion, feeling comforted and cared by him. Thus, based on the visitation of pets to patients hospitalized in an oncologic hospital, the author evidenced that, besides the reduction of negative
symptoms, the animals became a reference, a source of intimacy, and a re-signification of illness and life for the patients. Reports also collected by Rocha pointed out that the opportunity to interact with their animals provided reparative therapeutic effects in all patients, once they became more willing to participate in decisions regarding their treatments. These decisions, although not curative, were intended to improve the patients’ conditioning, in order to receive their pets more willingly. According to Costa, for patients who do not share family relationships with other people, animals are constant sources of comfort and intimacy, representing chances to care for other beings. Another ethical issue to be considered, concerning many elderly patients, is the fact that they have no one to take care of their animals, triggering moments of anguish that interfere with their well-being. The use of the patient’s own animal also configures a BEA issue, since the reunion also provides benefits to the animal, which misses its tutor.

4. Conclusions

The results of the present study bring an overview of the insertion of natural elements in palliative care practices, confirming the hypothesis that, although the reports of interventions are still incipient, it is already possible to glimpse their legitimacy. However, ethical reflection and scientific evaluation are necessary in the care and priorities at the end of life, from the bioethical perspective, in order to minimize the vulnerabilities inherent to this period of facing some incurable disease. The practice promotes the synergy of the principles of palliative care, based on the support of psychological and spiritual aspects, and the improvement of the quality of life of patients, highlighting, especially, the emotional benefits of biophilia and zootherapy.

From the data of the present study, it was possible to confirm the hypothesis that the benefits resulting from the intrinsic and natural inter-relationship between human beings and the natural elements are effective at times of high vulnerability, proving to be capable of promoting benefits in the biopsychosocial and spiritual spheres. This is because, corresponding to the principles of palliative care, they intend to offer a support system for patients to live as actively as possible until their death. Added to the integration of psychological, social, and spiritual aspects to the clinical one, this support transposes the initial belief of the insufficiency of the practice in face of the brevity of the interventions.

The results attest to the hypothesis of efficacy of usual methods, such as animal therapy with dogs, through the insertion of uncommon methods in the national scenario, such as the promotion of conviviality with natural elements, like plants, water, landscapes and fruits. The reflection of the scientific content analyzed allowed us to suggest the insertion of therapeutic horticulture in hospices and to create programs for pet visits. The research results allow the promotion of new looks and conducts in relation to methods based on biophilia, in order to soften and value the end of life of those under care.

The analysis of the question from the perspective of bioethics allows the identification of vulnerabilities inherent to this moment of finitude—which equally impact family members and the medical team—in which the insertion of biophilic elements constitutes a means of mitigating these conditions. Once it promotes a communication channel between the actors involved in this scenario and the confluence of common values, it aims at valuing life and the non-suffering of all living beings. Thus, in maintaining the identity and integrity of patients in palliative care, biophilia is an important aspect to be considered.

For some people, taking care of a garden, interacting with animals, or simply contemplating nature may involve values that have no equivalence to be respected as practices of dignity. However, when considering the ecological dimension of an individual and the environmental values that compose it, one understands this dignity to be respected and preserved. This dimension is expressed by biophilia as an innate need to affiliate with other life forms, and cannot be disregarded in palliative care practice. It is emphasized that the indication and encouragement of a healthy coexistence with natural elements may be part of the educational and health agendas well before the disease appears, preventing its manifestation, putting the Biophilia Hypothesis into
practice.

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Conflict of interest

The authors declare that they have no conflict of interest.

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