

The presence of animals in hospital facilities: A preliminary study on the opinion of doctors, healthcare workers, and students in Sardinia

SAGE Open Medicine

Volume 12: 1–10

© The Author(s) 2024

Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/20503121241275230

journals.sagepub.com/home/smo

Eraldo Sanna Passino^{1,2,3} , Sara Sechi¹, Alessandra Mollica¹, Fabrizio Demaria⁴ and Raffaella Cocco¹

Abstract

Introduction: Contact with pets within healthcare settings is considered worldwide an added value to assistance both in the case of animal-assisted interventions and also when pets are visiting hospitalized owners, due to the special emotional relationship between them and their pets. The goal of this work was to analyze local experiences on access of pets to healthcare facilities using a survey sent to doctors, veterinarians, and students in the region of Sardinia (Italy).

Methods: The online survey consisted of 17 questions, with the objective to evaluate knowledge and interest of study participants on some aspects of human–animal interaction with particular reference to potential access of pets to hospitals facilities and nursing homes and to promote an initial social judgment in the medical and healthcare environment. A total of 2484 subjects were invited to participate to the survey through an email explaining the purpose of the study. Statistical analysis on the survey results was conducted by comparing the characteristics of respondents with their answers to animal-assisted-intervention-related questions.

Results: Results showed that over 70% of the participants owned an animal; almost 80% of responses showed that survey participants were in favor of animal presence in hospitals; furthermore, the responses showed how the concept of One Health seems not only scarcely established, but also barely known. The large majority of respondents (over 80%) positively responded on questions around the role of animals as co-therapists.

Conclusions: On the one hand, this study showed lack of knowledge on the concept of One Health, whose essence is too often unknown and, on the other hand, it confirmed that women may be more inclined to show empathy and sensitivity toward animals. Regarding the profession, students seem more concerned about the introduction of animals into hospitals than healthcare workers.

Keywords

AAI, pet, hospital facilities, one health, health care facilities

Date received: 1 February 2024; accepted: 11 July 2024

What do we already know about this topic?

Animal-assisted interventions is a broad term that is now commonly used to describe the use of various animal species beneficial to humans in different ways. This topic is very impactful around the world. Several scientific studies testify the presence of expert personnel and adequate organization.

How does your research contribute to the field?

The research illustrates a cross-sectional study conducted in a small area of Europe (Sardinia, Italy), while the questionnaire,

¹Department of Veterinary Medicine, University of Sassari, Sassari, Italy

²Centro di Chirurgia Comparata, University of Sassari, Sassari, Italy

³Animal Welfare and Ethics Committee (OPBSA), University of Sassari, Sassari, Italy

⁴Psychology and Organizational Well-Being Unit, Sassari University Hospital, Sassari, Italy

Corresponding author:

Eraldo Sanna Passino, Department of Veterinary Medicine, University of Sassari, Via Vienna, 2, Sassari 07100, Italy.

Email: esp@uniss.it



which involved various sectors potentially interested in this topic, demonstrates the different awareness and opinions by practitioners and students in the region toward this important theme.

What are the implications of your research for theory, practice, or policy?

Findings suggest that within the region of Sardinia, considerable progress has yet to be made in order to achieve a broader adoption of the methodology in order to ensure the effectiveness of such therapeutic support that could improve patients' quality of life.

Introduction

Anthrozoology is a recent science that deals with the relationship between human beings and animals by focusing not only on the animal performance but also on the components of the relationship with animals, considering this relationship unique and irreplaceable for human beings.^{1,2} The human–animal interaction represents a path as old as human evolution. Besides being useful, animals also have a value that comes directly from the specificity of the relationship that sees them as protagonists. This relationship changes continuously in relation to our way of being. Thanks to advances in biology, ethology, medicine, and veterinary medicine, the non-human creature is no longer considered an instrument subservient to humans but also a living being capable of feeling joy and pain that can share different stages of life with human beings.^{3,4} Since the 1950s, especially in Anglo-Saxon countries, initiatives have arisen to promote the relationship with animals for rehabilitation as well as for therapy and educational purposes. Despite the introduction of the new concept of Animal-Assisted Interventions (AAIs), the term of Pet Therapy coined in 1964 by child psychiatrist Boris M. Levinson is even now often used to refer to the methodological structuring of animal-subjects involvement aimed at treating specific pathologies.^{5–7} Likewise in Italy, contact with pets in healthcare settings is considered an added value for assistance, not only in the case of AAIs but also due to the valuable emotional relationship between pets and owners.^{8,9} The fragility of hospitalized patients requires a careful assessment of their health conditions during contact with animals, but once all the necessary assessments have been made the benefits are great. All scientific studies analyzed show that the relationship with animals has positive effects on the process of care and rehabilitation of patients at any age.^{10–15} The contact and the sight of the pet, thanks to the joy that pets manifest to the owner, increase the psychophysical well-being of the patient; in addition, pets can improve the patient response to treatment and increase the motivation for returning home.^{16–18}

In many cases, the presence of an animal consolidates an emotional relationship with the patient, and through this relationship, both a communication channel and a stimulus to the

active participation of the beneficiary to interventions are established. The idea of animals joining third parties is fundamental; in fact, it is not just the dog or any other animal that carries out an intervention, but a multidisciplinary team. The positive effects involve the area of socialization in the case of patients diagnosed with depression, autism, generic developmental disorders, and the cognitive area (psychiatric and neurological disorders), as well as the emotional (adaptation difficulties, learning disorders) and neuromotor areas.^{19–23} The shift of attention from the disease to the sick person and from the sick person to the person seen in his/her psychophysical entirety can promote the study and use of complementary therapies that intend to provide more integrated answers to the patient's needs; moreover, the illness is no longer considered an isolated fact but instead the result of a complex of events concerning the social environment and the life history of individuals (ISSN 1123-3117; ISTISAN 07/35 reports).²⁴ Besides treating the pathology, the treatment given to a patient inside and outside the hospital should aim at improving his/her quality of life so as to limit the risk of psychopathological consequences that might condition the future life of the patient; treatment should recall home environment and the normal living conditions of patients to provide important therapeutic benefits, aimed at maintaining and/or help recovering patients' psychophysical health.⁷ Social support is a constitutive element of the treatment and falls within the responsibility of each therapy figure: doctors, nurses, psychologists, and the treating team as a whole. The constant collaboration with psychologists who have acquired specific experience on communication allows us to better address these issues.²⁵ Psychology, in fact, responds to the need for specific analysis on psychic processes involved in the adaptation of patients to the disease and on the assessment of their quality of life.

The examples of “pet-friendly” departments in Italy are increasingly numerous and range from North to South.^{25,26} In fact, in various regions, decrees have recently been issued allowing and regulating the access of pets to comfort and visit patients both in public and private health and hospital facilities. The facilities are free to decide independently whether to admit animals to the wards and indicate which species are admitted, also providing special areas for visits when possible, based on the evaluation of the premises and the health condition of the guests. Additional clinical and diagnostic tests on animals may be required. Therefore, regional regulations have the task of regulating the access of pets to healthcare facilities and allow the adoption of laws containing specific provisions regarding access. Furthermore, some municipalities have approved ordinances based on the guidelines on free access of dogs and companion animals to public facilities and areas open to the public drawn up and promoted in 2010 by the Association of Italian Municipalities (ANCI); on the contrary, other municipalities have even adopted total access bans. In Lombardy, for example, pets can be brought to visit their owners hospitalized in nursing home and hospital facilities according to stringent rules on health, behavior, and hygiene, listed in the regional

regulation of 13 April 2017, implemented by all local health facilities (ATS) in the region. Approved by the Regional Council, the rules implemented by Regional Law 33/2009 combine the safety of patients with the benefits deriving from the emotional continuity of the relationship between hospitalized owners and their pets. Despite the opinion of detractors and skeptics, it is a regulation “in line with human–animal evolution.” While giving healthcare facilities the power to identify departments or areas where the introduction of animals is prohibited or where particular clinical-diagnostic tests are required on animals for the purposes of their access, the specific legislation of the Lombardy region assigns the task to local healthcare facilities to detail the rules. Also in the city of Sassari, the University Hospital Board has approved a regulation for pet access to the hospital area aimed at hospitalized patients (resolution no. 368 of 23 May 2018).

This study illustrates the results of a questionnaire distributed to doctors, healthcare workers, and trainees who operate in facilities run by the National Health Service or in different medical and veterinary organizations and institutions in the Sardinian Region in order to get a feedback by the personnel dealing with this issue and to understand the potential realization of the project.

Materials and methods

This is a preliminary descriptive observational study in a particular cohort of the population of Northern Sardinia (students, doctors, veterinarians, and healthcare workers). The data collection is not intended to represent a comparison with the entire population of Sardinia or that specific territory. No exclusion criteria were considered in the study in the absence of potential risks for the participants.

Survey description

The project involved the creation of a short questionnaire to be sent to the structured staff of the National Health Service (NHS, Sardinia, Italy) with particular reference to Doctors and Vets at Sassari University Hospital; the survey also included structured staff from the Departments of Veterinary Medicine, Biomedical Sciences and Medical, Surgical and Experimental Sciences, from the University of Sassari as well as from private practice veterinarians operating in Sardinia. Students enrolled at the Degree Courses in Medicine and Surgery, Veterinary Medicine, Nursing Sciences and Healthcare enrolled at the University of Sassari were also involved. The online survey consisting of seventeen questions was created using Google Drive to evaluate both knowledge and interest of study participants on some aspects of human–animal interaction, focusing on the issue of the potential access of pets to hospitals facilities and nursing homes; the survey also aimed at promotional initial social judgment in the medical and healthcare environment, also among prospective doctors. The questionnaire used in

this study was not validated or pilot-tested; it was self-produced and designed as a closed multiple-choice questionnaire precisely to adapt it to such a heterogeneous audience. The Ethics Committee of the University of Sassari (OPBSA) approved the form and type of the questionnaire collected anonymously, authorizing the absence of written informed consent (aut.n. 0112609).

The questionnaire was entitled *Accessing to the hospital with an animal: what possibilities?* and started with a brief explanation about the study objective. The first part classified the answers by gender, age, and profession; the second aimed at exploring the human–animal relationship and the possible issues arising from introducing animals to the hospital for therapeutic purposes.

A total of 2484 subjects were invited to participate to the survey through an email explaining the purpose of the study, based on anonymous and voluntary participation. The survey required no more than 15 min to be completed and the link remained open for 3 months (March–May 2020). In addition to the email invitation, a reminder email was sent to nonrespondents 30 days after the first. Each participant was allowed to complete the survey only once. A total of 848 out of the 2484 potential respondents completed the survey for an overall response of 34.1%.

It is useful to outline the characteristics of the people who participated to the survey by highlighting four elements: gender, age, qualification, and job.

With regard to age, although there is a good representation of the different groups, the first (18–25) and fifth age groups (51–60) are more represented; another consideration should be made on the correlation between qualification and profession, as some gaps in the data can be noticed. In fact, only 20% among those who answered the questionnaire have a Degree in Medicine and Surgery or Veterinary Medicine, while 33% is represented by students and 46% by other professions; among the latter, 60% cannot be classified as technical professions.

The questions in the survey were divided into two groups, capturing the characteristics of respondents (Group 1) and their opinions on AAI (Group 2). The questions in the two groups are summarized in Tables 1 and 2, respectively, with their abbreviated names used in a subsequent analysis in this work.

Statistical analysis

Statistical analysis of the survey results was conducted by comparing the characteristics of respondents (variables in Group 1) to their answers on AAI-related questions (variables in Group 2). Since the possible responses are discrete and categorical (see column Options in Tables 1 and 2), a Pearson’s Chi-square test for contingency tables was selected being a suitable statistical test to assess whether opinions related to AAI (variables in Group 2) do not depend on characteristics of respondents (variables in Group 1). If the number of degrees of freedom was equal to one (implying that

Table 1. Questions, options and abbreviations for *Group 1 (Characteristics of respondents)*.

#	Question	Options	Options
1	Gender	Male, female	GENDER
2	Age	18–25, 26–30, 31–40, 41–50, 51–60, >60	AGE
3	Profession	Medical doctor, veterinarian, student, other	PROFESSION
4	*Only if answered <i>Medical doctor</i> in 3* What is your employment type as medical doctor?	General medicine, clinician, NHS, specialization, university	MED
5	*Only if answered <i>Veterinarian</i> in 3* What is your employment type as a veterinarian?	Practitioner (small animals), practitioner (large animals), NHS, istituto zooprofilattico, regional agency or research institute, other	VET
6	*Only if answered <i>Student</i> in 3* Which university degree are you pursuing?	Medicine, veterinary medicine nursing, biology, other healthcare degrees, other	STUDENT
7	*Only if answered <i>Other</i> in 3* What is your profession?	Biologist, physiotherapist, nurse, assistant nurse, lab technician, other	OTHER
8	Do you own pets?	Yes, no	OWNER
9	*Only if answered <i>Yes</i> in 8* Which animal species do you own?	Dog, cat, horse, other	SPECIES
10	How would you rate your experiences with animals during your childhood?	Positive, negative, none	EXPERIENCE

Table 2. Questions, possible options, and abbreviations for *Group 2 (Opinions on AAI)*.

#	Question	Options	Options
11	Are you in favor of the access of pets and animals owned by patients in hospitals and healthcare centers?	Yes, no	ACCESS
12	Are you aware if any hospitals in your area that allow access of animals to healthcare facilities?	Yes, no	AWARENESS
13	Have you ever heard about the concept of “One Health”?	Yes, no	ONE_HEALTH
14	Do you think that a regulated and controlled animal involvement for scientific purposes and emotional support is useful to enhance the current knowledge and treatments in medicine?	Yes, no	SUPPORT
15	Do you think the presence of animals in the hospital or nursing home can improve the patient’s clinical conditions?	Yes, no	PRESENCE
16	Do you think an animal can be emotionally affected by its owner’s suffering and act as a co-therapist?	Yes, no	CO_THERAPY
17	Would you recommend the presence in the house and the company of an animal to a patient who is able to manage it independently?	Yes, no	RECOMMEND

both the first and second variable under consideration have only two possible responses), then a Yates’ correction was also applied to the test. The relationship between the two variables was considered significant if the *p*-value calculated from the Pearson’s test was less than 0.0007143 (corresponding to a Bonferroni-corrected significance level of 0.05). Table 3 reports the results for all pairs of variables with resulting *p*-value less than 0.1. The relationship is considered significant only if the *p*-value is lower than the Bonferroni-corrected threshold of 0.0007143. The results were obtained by analyzing data using the statistical software R.

Results

The results of the questionnaire are summarized in Tables 3 and 4. They show that over 70% of the participants own

Table 3. Total number of responses and corresponding percentages for each Yes/No answers.

Variable	Yes	No
OWNER	624 (73.67%)	223 (26.33%)
ACCESS	669 (79.55%)	172 (20.45%)
AWARENESS	172 (20.33%)	674 (79.67%)
ONE_HEALTH	318 (37.68%)	526 (62.32%)
SUPPORT	785 (93.68%)	53 (6.32%)
PRESENCE	740 (87.89%)	102 (12.11%)
CO_THERAPY	800 (94.79%)	44 (5.21%)

an animal, indicating a strong presence of pets in the family environment and an increasing sensitivity and attention to the animal world; in addition, several participants reported positive experiences with pets since childhood,

Table 4. Total number of responses and corresponding percentages for answers from the survey.

Variable	Answer	Frequency
GENDER	Female	608 (71.70%)
GENDER	Male	240 (28.30%)
AGE	18–25	217 (25.65%)
AGE	26–30	77 (9.10%)
AGE	31–40	100 (11.82%)
AGE	41–50	159 (18.79%)
AGE	51–60	210 (24.82%)
AGE	>60	81 (9.57%)
PROFESSION	Medical doctor	83 (9.88%)
PROFESSION	Veterinarian	84 (10.00%)
PROFESSION	Student	286 (34.05%)
PROFESSION	Other	387 (46.07%)
MED	General medicine	1 (1.19%)
MED	Clinician	19 (22.62%)
MED	NHS	51 (60.71%)
MED	Specialization	2 (2.38%)
MED	University	11 (13.10%)
VET	Practitioner (small animals)	34 (34.69%)
VET	Practitioner (large animals)	2 (2.04%)
VET	NHS	15 (15.31%)
VET	Istituto zooprofilattico	12 (12.24%)
VET	Regional agency or research institute	10 (10.20%)
VET	Other	25 (25.51%)
STUDENT	Medicine	204 (69.15%)
STUDENT	Veterinary medicine	36 (12.20%)
STUDENT	Nursing	11 (3.73%)
STUDENT	Biology	18 (6.10%)
STUDENT	Other healthcare degrees	14 (4.75%)
STUDENT	Other	12 (4.07%)
OTHER	Biologist	25 (5.94%)
OTHER	Physiotherapist	10 (2.38%)
OTHER	Nurse	92 (21.85%)
OTHER	Assistant nurse	4 (0.95%)
OTHER	Lab technician	31 (7.36%)
OTHER	Other	259 (61.52%)
EXPERIENCE	Positive	762 (89.96%)
EXPERIENCE	Negative	33 (3.90%)
EXPERIENCE	None	52 (6.14%)
SPECIES	Dog	394 (62.64%)
SPECIES	Cat	197 (31.32%)
SPECIES	Horse	9 (1.43%)
SPECIES	Other	29 (4.61%)

demonstrating that the relationship with animals and the attention to the animal world is strong in the families, especially in the current period, considering recent demographic trends.²⁷ House pets, namely, dogs and cats, are the most represented animals and the owners who responded have almost exclusively had positive experiences with them in their childhood. Almost 80% of the responses showed that survey's participants were in favor

of animal entry into hospitals; however, the same percentage was not aware of the possibility to do so. Even in Sassari, the area where the study was conducted, in fact, the University Hospital Board approved a regulation for pet access to the hospital facilities aimed at visiting hospitalized patients (resolution no. 368 of 23 May 2018). This result underlines the need for more effective communication, especially for what concerns students during the training period, in order to promote implementation of a service that is already available, even though currently not well known. Furthermore, the responses show how the concept of “One Health” seems not only scarcely established, but also barely known.

This aspect probably represents the real limitation of the process where it is essential to recognize the human–animal–environment relationship as an important element in the development of a disease and during any diagnostic and treatment path creation. Animal welfare is a complex and multidisciplinary concept with scientific, ethical, and legal dimensions. As animal welfare research has progressed, more areas of biology have been incorporated leading to an improvement for what concerns research on human welfare.

Interestingly, over 90% of the responses showed that the use of animals for experimental purposes in compliance with laws and animal welfare should be considered well-grounded and necessary. Data are important, albeit restricted to specific categories based on the type of occupation.

Furthermore, a large majority of respondents (over 80%) positively responded on questions around the role of animals as co-therapists. These questions, formulated in different ways, confirm the importance given to the role of animals during the process of care, rehabilitation, and emotional support of a patient not only in the hospital/healthcare facility but also in the family context, especially when the patient is able to manage pets independently.

After analyzing the results separately for each variable, the correlations between pairs of variables were analyzed via statistical testing. Table 3 shows the significant pairwise comparisons between variables in Groups 1 and 2 (see Tables 1 and 2) based on Pearson's Chi-square tests. It shows that the most significant statistical relationship between two variables can be found for the pair EXPERIENCE and RECOMMEND, demonstrating that having had a negative experience with animals during childhood has a negative effect on the probability of recommending the company of an animal to a patient who is able to manage it independently. This is not a surprising result, as it shows how previous experiences with animals might have a significant effect on opinions on AAI. Childhood experience with animals (variable EXPERIENCE) also has a statistically significant relationship with four additional variables: PRESENCE, ACCESS, CO-THERAPY, and SUPPORT (respectively ranked 3, 7, 8, and 11 in terms of the Pearson's Chi-square test *p*-values). If negative experiences with animals occurred

Table 5. Significant pairwise comparisons between variables in Groups 1 and 2 based on Pearson's Chi-square tests. Variable pairs are ordered by increasing p -value. The variable names match Tables 1 and 2.

Variable 1 (Group 1)	Variable 2 (Group 2)	p -Value
EXPERIENCE	RECOMMEND	3.80×10^{-33}
PROFESSION	ONE_HEALTH	6.65×10^{-28}
EXPERIENCE	PRESENCE	6.13×10^{-20}
AGE	ONE_HEALTH	6.47×10^{-18}
OWNER	RECOMMEND	3.65×10^{-16}
OWNER	ACCESS	1.69×10^{-14}
EXPERIENCE	ACCESS	2.58×10^{-13}
EXPERIENCE	CO_THERAPY	3.59×10^{-12}
GENDER	ACCESS	2.57×10^{-8}
OWNER	PRESENCE	4.16×10^{-8}
EXPERIENCE	SUPPORT	1.04×10^{-6}
OWNER	AWARENESS	1.06×10^{-5}
STUDENT	ONE_HEALTH	0.00011352
AGE	RECOMMEND	0.00031064
GENDER	PRESENCE	0.00045417
PROFESSION	RECOMMEND	0.00061040

during respondent's childhood, the survey shows a significant decrease in the probability of answering positively to the following questions:

- "Do you think the presence of an animal in the hospital or nursing home can improve the patient's clinical conditions?"
- "Are you in favor of the access of pets and animals owned by patients in hospitals and healthcare centers?"
- "Do you think an animal can be emotionally affected by its owner's suffering and act as a co-therapist?"
- "Do you think that a regulated and controlled animal involvement for scientific purposes and emotional support is useful to enhance the current knowledge and treatments in medicine?"

Additionally, Table 3 shows that the second most significant relationship between variables occurs between PROFESSION and ONE_HEALTH. We investigated this relationship further in Table 4, to obtain further insights on which professions show awareness of *One Health* concept in the region involved by the study.

Tables 4–6 demonstrate that, in general, veterinarians tend to be significantly more aware of the concept of *One Health* compared to members of other professions. Thus, Table 4 shows that students are significantly less likely to be aware of *One Health* compared to professionals. This result demonstrates that efforts should be devoted to promote knowledge on the benefits of AAI and *One Health* among medical doctors in the region to increase awareness about this concept. Additionally, university programs in the region should be

revised to incorporate these subjects into the training of future professionals in the medical and veterinary fields.

It should be noted that results in Tables 4–6 also explain why the fourth most significant relationship found through the survey occurs between AGE and ONE_HEALTH: the variable PROFESSION is highly correlated with AGE since most of the students tend to be in the age bands 18–25 and 26–30; overall, only 16.66% of participants under 30 years of age know about the concept of *One Health*. It must be remarked that the variable ONE_HEALTH also has a significant association with the variable STUDENT (ranked 13th for significance), representing the degree course where each student is enrolled: 44.44% of Veterinary Medicine students who answered the survey know about *One Health*, compared to only 14.28% of students from all the other degree courses combined.

Another variable that appears to be highly correlated with the outcomes and responses around AAI is OWNER, expressing whether the respondent owns a pet. In particular, the variable is significantly associated with RECOMMEND, ACCESS, PRESENCE, and AWARENESS (ranking 5, 6, 10, and 12, respectively). This demonstrates that pet owners are statistically more likely to have positive opinion toward AAI and presence of pets in hospitals and healthcare facilities.

Furthermore, the variable GENDER also appeared to be related to the response about ACCESS and PRESENCE (ranked 9 and 15, respectively). Female respondents were statistically more likely than male respondents to be in favor of access to hospitals and healthcare facilities of pets and animals owned by patients: 84.62% of positive responses for female respondents, compared to 67.08% for male respondents. Similar figures were observed for the variable PRESENCE.

There is sufficient statistical evidence to suggest that the variable PROFESSION has an effect on the variable RECOMMEND: in particular, students are significantly less likely to recommend the presence in the house and the company of an animal to a patient who is able to manage it independently (72.72% of positive responses for students, as opposed to 90.36% for clinical doctors).

Finally, in order to evaluate the internal consistency of the questionnaire, we calculated post hoc reliability scores after data collection based on the standard statistical technique of half-splitting, with scores indicating an acceptable to good reliability of the questionnaire (the Spearman–Brown score was 0.7271 and the guttman's Lambda 6, G6, is 0.7020).

Discussion

In recent years, research in the field of Animal Assisted Interventions strongly increased focusing on the study of effects on social attention, social behavior, personal interactions and mood, as well as on parameters related to stress, such as cortisol levels, heart rate, blood pressure, self-assessed anxiety, and mental and physical health of patie

Table 6. Table shows cross-frequencies for the outcomes of questions PROFESSION and ONE_HEALTH.

Answer to PROFESSION	Profession	Answer to ONE_HEALTH		
		No	Yes	Total
Answer to PROFESSION	Medical doctor	42 (50.61%)	41 (49.39%)	84
	Veterinarian	16 (19.05%)	68 (80.95%)	83
	Student	239 (83.57%)	47 (16.43%)	286
	Other	155 (40.46%)	228 (59.54%)	383
	Total	524	312	836

nts.^{11,12,19,20,28} It is of particular importance the document of the National Committee for Bioethics (NBC, Italy) on the use of animals in activities related to human health and well-being, which analyzes the inherent issues in the perspective of a human–animal interaction aimed at establishing a peculiar form of “therapeutic alliance.”

The bioethical problem concerns the evaluation of both the presumed benefits of these activities for humans and the measures adopted so that animals can also benefit from them.

1. Cohabitation of a sick human being with an animal in their own home or in a nursing home;
2. Training and use of an animal that helps a disabled person in daily life;
3. Animal-assisted therapies;
4. Animal-assisted activities.

According to NBC, it is very important not only “. . . that through an evaluation of the protocols by the Ethics Committees, research is supported, aiming at identifying real benefits for human health and well-being, considering all the risks associated with allergies and infections, but also, that these researches make use of so-called ‘gentle’ training techniques in order not to alter the well-being of the animals and, possibly, improve their quality of life. . .” The document accepts the common use of the expression Pet Therapy with the *caveat* that it would not be correct to include in this concept the activities carried out by assistance animals (for the blind, motor disabled, deaf, etc.).

The study has some limitations: a first methodological criticality concerns the representativeness of the sample and the data quality. No pre-existing validated questionnaire existed for this topic, and the questionnaire used in this study was not validated or pilot-tested, primarily because the questionnaire was intended to be administered only to a small group of veterinarians and medical practitioners and students, and not to the general population. Although the questionnaire was not validated or pilot tested at the time of its design and administration, post hoc reliability scores calculated after data collection based on the standard statistical technique of half-splitting, commonly used in psychology, indicated an acceptable to good reliability.

Since we were not able to draw a representative sample for the survey tool used (online survey), the results here showed only refer to people who agreed to answer the questionnaire. Furthermore, the different methods of accessing the web, as well as the time available, may have led to an under-representation of some categories compared to others.

A second methodological problem concerns the quality of data as web surveys do not allow control of the response process. This is a preliminary study to understand the awareness of the topic covered (possible presence of animals in hospital facilities) in a particular cohort of the population in Northern Sardinia (students, doctors, veterinarians, and healthcare workers). Data collection was not intended to represent a comparison with the entire population of Sardinia or to that specific territory. Another limitation is not performing power analysis for the sample size.

In any case, the authors interpreted the questionnaire as a research and measurement tool designed to collect information on qualitative and quantitative variables under investigation. They adapted it with respect to the standard schemes proposed by formulating the questions in order to stimulate all respondents in the same way, with the aim of constructing the scenario in reference to the purpose of the research, valuing the individual and the context. However, the authors are aware that these tests are not without criticism. When it comes to quantifying any dimension or psychological characteristic perhaps, it would be more effective to resort to completely different interviewing techniques through which it may be possible to obtain a wider range of information with fewer variables. In any case, the statistical analysis provides insight to frame the different aspects on a currently relevant topic addressed through different approaches around the world. Certainly, there is a lot of work to be done in terms of training and culture in different environments to help understand the importance of the investigated issue.

With particular reference to the lack of knowledge on the concept of One Health, whose essence is too often unknown, we connected the possible explanations to the fact that knowledge of One Health concept by Human Medicine students is lower than Veterinary Medicine students:

1. Focus on human diseases: Medical students are primarily trained to care for human health and therefore may focus more on diseases that affect humans. As a result, less emphasis may be placed on interactions between human, animal, and environmental health.
 2. Different educational curriculum: study programs for medical students may vary between different universities and countries. There may be a lack of systematic inclusion of the concept of One Health in medical curricula due to different priorities or lack of awareness about the importance of this approach.
 3. Lack of practical exposure: medical students may have fewer opportunities for hands-on experiences involving animal and environmental health, compared to Veterinary Medicine students who spend more time exposed to animals and to the ecosystem. Practical experience is often an important factor in developing an in-depth understanding of interactions between different health domains.
 4. Limited familiarity: although the concept of One Health has been gaining an increasing attention in recent years, it may not yet be widely known among medical students. There may be a need to raise awareness about the concept and importance of the One Health approach during healthcare professionals training.
2. Fear of contagion: Children may worry about contracting diseases or infections from animals, especially if they have limited knowledge on proper hygiene rules for interacting with animals.
 3. Disturbance of personal comfort: Some students may prefer a clean and quiet hospital environment and may worry that the presence of animals may not be compatible with hygiene standards.
 4. Responsibility: Some children may understand that animals require care, attention and responsibility and may worry that introducing animals into hospitals may be difficult or require additional staff and resources.

It is important to keep in mind that student concerns can be influenced by cultural, family, and educational factors.

We can summarize the problems related to the proposed topic analyzed according to the strengths-weaknesses-opportunities-threats (SWOT) scheme. The strengths can be easily summarized as: improvement of the quality of life conditions during hospitalization, especially for long hospitalization periods and possibility to offer a modern and integrated therapeutic program.³⁴ The weaknesses, on the other hand, are represented by various needs called into question, such as the presence of specialized personnel and multidisciplinary teams; the latter are increasingly present in the therapeutic approach, while instead adequate spaces are not always available in the different healthcare facilities as this might lead to a significant increase in control activities and higher costs. Patient-client information is an important element as, despite the presence of specific regulations, the actual possibility to access to facilities with an animal is not always known.

The opportunities are mainly related to the improvement of the patient's well-being and to the promotion of harmony among healthcare workers in the working environment as well, with a possible reduction in hospitalization length and important social repercussions. Eventually, the quality perceived by users plays no less importance, with possible implications in the medical procedures, which might often be facilitated.

Finally, the threats are mainly related to hygiene standards due to an increase, albeit controlled, of biological risk and potential problems connected to environment sanitation.

Improvement of procedures aimed at ensuring the analysis of the processes and the attribution of responsibilities also in healthcare settings makes it possible to evaluate the critical issues that might compromise both the process and the effectiveness and safety of the project, as well as to favor improvement of service quality through the constant safety control evaluation. It is now confirmed by considerable scientific evidence that an animal carefully selected, evaluated, and monitored can become a real partner in the healing process, instilling motivation and confidence in the patient with whom the program is built. Evidence is particularly significant in children, adolescents, and the elderly. Opening the hospital to

However, it should be noted that there are also several exceptions and many doctors are aware of the importance of interactions between human, animal, and environmental health and are working hard to promote the One Health approach.

A second important point concerns gender: there are several studies that suggest that women may be more inclined to show empathy and sensitivity toward animals.^{9,29-31} A study conducted in 2007 by Herzog et al.³⁰ and in 2007 by Colombo et al.³¹ highlighted that women tend to show greater empathy toward mistreated animals than men. In 2011, a research published in the journal *Animals* found that women are more likely than men to perceive animals as similar to themselves and to show empathetic behavior toward them.²⁹

A study conducted in 2022 by Melvin et al. found that women often show greater awareness and sensitivity toward animal issues than men.^{32,33} However, it is important to note that these studies are based on group averages and do not imply that all women are automatically more empathetic or sensitive toward animals than men. Sensitivity toward animals can be influenced by a number of cultural, family, and educational factors.

Regarding the profession, students may be more concerned about the introduction of animals into hospitals than healthcare workers for several reasons:

1. Fear of safety: Teens may have concerns about animal safety, especially if they are not used to interacting with pets or have had negative experiences in the past.

the animal world allows patients and their families to maintain contact with the usual world, especially if the patient has an animal at home, an element that can form a link with daily life at home, reducing the sense of isolation and loneliness, but also easing states of anxiety and depressions until the perception of pain decreases. First of all, it is important to separate and distinguish the concept of animals visiting the patients from the assisted program: it should be seen as an activity integrated into care provisions that needs defined times, a presence in the place well perceived as constant and not occasional, together with scheduled activities, adequate space to carry out activities, a specific setting, and definitions of the general aims of the project.

Conclusions

Animal-assisted interventions are interpreted as a co-therapy that integrates, strengthens, and supports traditional therapies and can be adopted for patients suffering from various pathologies, aiming at behavioral, physical, cognitive, psychosocial, and psychological-emotional improvement.

It is the main idea of a caring medicine, capable of combining care and treatment, illustrated according to typologies of human–animal relationships, aimed at improving the physical and mental state of subjects suffering from pathologies, or subjects with particular discomforts and needs.

The objective is to create an attitude of attention and respect toward biodiversity and, in particular, a model of medical bioethics, which, referring to the paradigm of caring, shifts the attention from the disease and the sick person “. . . to the person understood as a bio-psycho-historical entirety . . .”; at the same time aware of the importance of the psychoaffective basis of the state of health and disease and that, even in the case of incurable or chronic diseases, medicine can and must always find intervention strategies aimed at improving the quality of life of patients.

Acknowledgements

Not applicable.

Author contributions

Conceptualization E.S.P., F.D.; Methodology E.S.P., F.D., and S.S.; Formal analysis E.S.P., and R.C.; Dissemination of the survey E.S.P., F.D., R.C., A.M., and S.S.; Data curation, E.S.P., F.D., R.C., A.M., and S.S.; Writing-original draft preparation E.S.P.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was funded by University of Sassari, (“Fondo di Ateneo

per la Ricerca 2019 Sanna Passino”) and by Fondazione di Sardegna (CUP 83C22000170007).

Ethical statement

Ethical approval was not sought for the present study as the study was conducted according to the guidelines of the declaration of Helsinki. According to the regulations currently in force (Italian Legislative Decree n. 26/2014, implementation/application of the Directive of European Union n. 2010/63/EU on the protection of animals useful for scientific purposes; Article 2, point F), the manuscript does not require the authorization and/or a reasoned opinion from the Ethics Committee as no preclinical experiments on animals were performed, neither clinical trials involving animals were carried out nor sensitive information was collected on individuals who answered the questionnaire. Finally, a careful analysis of the questionnaire does not reveal the presence of any kind of discrimination (social, gender, and religion) in the way in which questions were asked.

Consent statement

The Ethics Committee of the University of Sassari (OPBSA) approved the form and type of the questionnaire collected anonymously, authorizing the absence of written informed consent (aut.n. 0112609). Informed consent was not sought for the present study as neither clinical trials involving animals were carried out nor sensitive information was collected on questionnaire respondents. Moreover, a careful analysis of the questionnaire does not reveal the presence of any kind of discrimination (social, gender, and religion) in the way in which the questions were asked.

ORCID iD

Eraldo Sanna Passino  <https://orcid.org/0000-0002-5600-6837>

Supplemental material

Supplemental material for this article is available online.

References

- Ballarini G and Chiappelloni S. *Animali amici della salute. Curarsi con la pet therapy*. Milano: Xenia, 2005.
- Merenda A. *Incontri terapeutici a quattro zampe. Gestalt therapy e prospettive di zooantropologia clinica*. Trapani, Italy: Il Pozzo di Giacobbe, 2014.
- Chalmers D and Dell CA. Applying One Health to the study of animal-assisted interventions. *Ecohealth* 2015; 12(4): 560–562.
- Ross H. One health from a social-ecological systems perspective: enriching social and cultural dimensions. *Curr Top Microbiol Immunol* 2013; 366: 217–229.
- Lerner H. A proposal for a comprehensive human–animal approach of evaluation for animal-assisted interventions. *Int J Environ Res Public Health* 2019; 16: 4305.
- Mandrà PP, Moretti TCDF, Avezum LA, et al. Animal assisted therapy: systematic review of literature. *Codas* 2019; 31(3): e20180243.
- Marcus DA. The science behind animal-assisted therapy. *Curr Pain Headache Rep* 2013; 17(4): 322.

8. Baiocchi C. *Quattro zampe in ospedale. L'esperienza di pet therapy in due ospedali della provincia di Como. Due anni di attività in corsia insieme ai cani*. Como, Italy: Azienda Sanitaria Locale della Provincia di Como, 2005.
9. Varoni MV, Serra PA and Sanna Passino E. Student insights towards animal welfare science and law. Survey results from Sassari University, Italy. *Sci Prog* 2023; 106(1): 1–18.
10. Ávila-Álvarez A, Pardo-Vázquez J, De-Rosende-Celeiro I, et al. Assessing the outcomes of an animal-assisted intervention in a paediatric day hospital: perceptions of children and parents. *Animals* 2020; 10: 1788.
- 1.1 Correale C, Borgi M, Collacchi B, et al. Improving the emotional distress and the experience of hospitalization in children and adolescent patients through animal assisted interventions: a systematic review. *Front Psychol* 2022; 13: 840107.
- 1.2 Ein N, Li L and Vickers K. The effect of pet therapy on the physiological and subjective stress response: a meta-analysis. *Stress Health* 2018; 34(4): 477–489.
13. Friedmann E, Katcher AH, Lynch JJ, et al. Animal companions and one-year survival of patients after discharge from a coronary care unit. *Public Health Rep* 1980; 95: 307–312.
14. Gaudet LA, Elliott SA, Ali S, et al. Pet therapy in the emergency department and ambulatory care: a systematic review and meta-analysis. *Acad Emerg Med* 2022; 29(8): 1008–1023.
15. Levine GN, Allen K, Braun LT, et al. Pet ownership and cardiovascular risk: a scientific statement from the American Heart Association. *Circulation* 2013; 127: 2353–2363.
16. Mubanga M, Byberg L, Egenvall A, et al. Dog ownership and survival after a major cardiovascular event a register-based prospective study. *Circ Cardiovasc Qual Outcomes* 2019; 11: 10.
17. Mugnai F. *Gli interventi assistiti con gli animali nell'area pediatrica*. Milan, Italy: Franco Angeli, 2017.
18. Stensland ML and McGeary DD. Use of animal-assisted interventions in relieving pain in healthcare settings: a systematic review. *Complement Ther Clin Pract* 2022; 46: 101519.
19. Overgaauw PAM, Vinke CM, van Hagen MAE, et al. A One Health perspective on the human-companion animal relationship with emphasis on zoonotic aspects. *Int J Environ Res Public Health* 2020; 17(11): 3789.
20. Allen K, Shykoff BE and Izzo JL Jr. Pet ownership, but not ace inhibitor therapy, blunts home blood pressure responses to mental stress. *Hypertension* 2001; 38: 815–820.
21. Cocco R and Sechi S. *Training per cani coterapeuti e supporto disabili (un approccio neuropsicologico)*. Italy: Edizioni Centro Studi Erickson, 2017.
22. Ministero della Salute Istituto, Zooprofilatti cosperimentale delle Venezie. *Interventi assistiti con gli animali (IAA) e COVID-19*. Indicazioni Operative, 2020.
23. Cirulli F and Alleva E. *Terapie e attività assistite con gli animali: analisi della situazione italiana e proposta di linee guida*. Roma: Istituto Superiore di Sanità, 2007.
24. Chino FJ. Pet therapy: how the cat I never wanted saved my life. *Clin Oncol* 2020; 38(15): 1744–1745.
25. Linder DE, Siebens CH, Mueller MK, et al. Animal-assisted interventions: a national survey of health and safety policies in hospitals, eldercare facilities, and therapy animal organizations. *Am J Infect Control* 2017; 45: 883–887.
26. Feng Y, Lin Y, Zhang N, et al. Effects of animal-assisted therapy on hospitalized children and teenagers: a systematic review and meta-analysis. *J Pediatr Nurs* 2021; 60: 11–23.
27. Meers LL, Contalbrigo L, Samuels WE, et al. Canine-assisted interventions and the relevance of welfare assessments for human health, and transmission of zoonosis: a literature review. *Front Vet Sci* 2022; 9: 899889.
28. Chan MC-H, Schonert-Reichl KA and Binfet J-T. Human–animal interactions and the promotion of social and emotional competencies: a scoping review. *Anthrozoos* 2022; 35(2): 1–46.
29. Dalton KR, Waite KB, Ruble K, et al. Risks associated with animal-assisted intervention programs: a literature review. *Complement Ther Clin Pract* 2020; 39: 101145.
30. Herzog HA. Gender differences in human–animal interactions: a review. *Anthrozoos* 2007; 20(1): 7–21.
31. Colombo ES, Crippa F, Calderari T, et al. Empathy toward animals and people: the role of gender and length of service in a sample of Italian veterinarians. *J Veter Behav* 2017; 17: 32–37.
32. Phillips C, Izmirli S, Aldavood J, et al. An international comparison of female and male students' attitudes to the use of animals. *Animals* 2011; 1: 7–26.
33. Guo Z, Ren X, Zhao J, et al. Can pets replace children? The interaction effect of pet attachment and subjective socioeconomic status on fertility intention. *Int J Environ Res Public Health* 2021; 18(16): 8610.
34. Barchas D, Melaragni M, Abraham H, et al. The best medicine. Personal pets and therapy animals in the hospital setting. *Crit Care Nurs Clin Am* 2020; 32: 167–190.