







“Just old age” – a qualitative investigation of owner and veterinary professional experiences of and attitudes to ageing in dogs in the UK

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OBJECTIVES: Many UK dogs live into old age, but owners may not recognise or report age-associated signs of disease which lead to negative welfare. This study investigated dog owner and veterinary professional experiences and attitudes towards ageing in dogs, how health care is offered, barriers to its delivery, and some best-practice solutions.

MATERIALS AND METHODS: In-depth semi-structured interviews were conducted with 15 owners of 21 dogs (aged 8 to 17 years mean: 13) and 11 veterinary professional (eight veterinary surgeons, two nurses and one physiotherapist). Open-text responses from 61 dog owner were collected using an online survey. Transcripts and survey responses were inductively coded into themes.

RESULTS: Four themes were constructed: “just old age”, barriers to care, trust in veterinary surgeons, and tools to improve health care. Age-related changes were mostly perceived as “just old age” by dog owner. Many dogs were no longer vaccinated and did not attend check-ups unless owners identified a problem. The greatest barriers to health care were finances (dog owner), owner awareness, willingness to act and consultation time (veterinary professional). Trust in veterinary professional was more likely when dog owner experienced continuity, prioritisation of care, clear communication and an accessible, knowledgeable and empathic veterinary professional. Participants suggested that senior health care and communication between dog owner and veterinary professional could be improved through questionnaires, and evidence-based online information.

CLINICAL SIGNIFICANCE: Opportunities to educate owners on which clinical signs represent healthy or pathological ageing are being missed. Resources should be developed to guide on best-practice discussions in consultations, encourage more owners to recognise clinical signs and to seek and trust veterinary advice.

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INTRODUCTION

Due to improved health care standards, dogs are living as much as twice as long as they did 40 years ago (Grimm 2015). As life expectancy increases, so does the potential amount of time spent with poor health (Wallis *et al.* 2018). Healthy ageing is “the process of developing and maintaining the functional ability that enables well-being in older age” (Beard *et al.* 2016). Even healthy ageing dogs show some declines in sensorimotor control, cognitive abilities and behavioural changes (Salvin *et al.* 2011), and since age is the greatest risk factor for morbidity and mortality (Hoffman *et al.* 2018, Urfer *et al.* 2020), older individuals are likely to suffer from one or more chronic diseases and some sensory loss (Jin *et al.* 2016, Wallis *et al.* 2018). If these chronic diseases are diagnosed and well managed, and do not affect dogs’ ability to function day-to-day, then they can be said to be ageing healthily. A proportion of the dog population suffers from a severe decline with age which is considered pathological and affects their daily life (Szabó *et al.* 2016) and their ability to display species-typical behavioural patterns such as play, sociability and exercise.

Since some of the signs of ageing (such as a gradual decrease in activity and play) can also be pathological, the recognition of diseases in dogs is key and is dependent on owners identifying and reporting physical and behavioural changes to their veterinary surgeon. Some owners may recognise clinical signs, but not consider them to be serious or treatable as they believe them to be a common part of the ageing process (Davies 2012, Belshaw *et al.* 2020b). When apparently healthy dogs (according to the owners) aged above 9 years were screened for age-related issues, at least one previously unrecognised problem was found in 80% of the dogs (Davies 2012, Willems *et al.* 2017). Other dog owner (DO) may recognise some physical and behavioural changes as abnormal, but do not present their dog to the veterinary clinic, as they are concerned about costs (Volk *et al.* 2011), or that the veterinary surgeon will recommend euthanasia (Belshaw 2017). Forty-two percent of UK dogs are uninsured (PDSA 2020), and as insurers charge higher premiums for senior dogs, they are less likely to be insured (Egenvall *et al.* 2000). Veterinary surgeons utilise yearly scheduled vaccination appointments to undertake clinical examinations in older pets; however, 23% of dogs do not receive annual boosters (PDSA 2020). Furthermore, when owners do bring their dog, consultations may focus on perceived current health problems, affording only limited time for discussion of wider or preventive health care (Belshaw *et al.* 2018a,b). This suggests that many older dogs might be missing out on veterinary care at a time when age-related diseases are most common, highlighting a potential welfare issue.

Therefore, guidelines for simple and standardised approaches to senior wellness would be useful. One way to relieve some of the consultation time pressure from veterinary surgeons would be to provide clients with “information prescriptions”. Short informational handouts and visual aids (graphs, photographs, video clips, etc.) are suggested to be valued by both veterinary professional (VP) and DO in order to aid understanding and informed choice when making decisions about health care (Critchley 2014,

Kogan *et al.* 2017). Before such aids can be created for senior dog care, a deeper understanding of how owners view and make decisions regarding the health of their ageing dog is required, as is improved understanding of how conversations and recommendations happen in the consulting room.

Qualitative methods, such as interviews, are specifically designed to deeply explore the intricacies of everyday behaviour and social relationships, including with animals, and the reasons why people act in the way they do (Fitzpatrick & Boulton 1996, Furtado & Christley 2021). They are particularly suited for understanding how people interpret health-related messaging but are sometimes unable to implement them to improve health outcomes (Pope & Mays 1995). For example, interviews and observations of DO have elucidated how their decisions around their dog’s exercise needs are constructed as perceptions about what is “best for the dog” (Westgarth *et al.* 2019). They can also shed light on the processes used by health care professionals when interacting with animals and their caregivers (Janke *et al.* 2021).

This study aimed to use qualitative research methods to investigate owner and VP expectations, experiences, and attitudes to ageing in dogs, including decisions around preventive health care, and general understanding of healthy and pathological changes during ageing. It also aimed to determine: (1) how senior dog preventive health care or treatment advice is currently offered in UK veterinary practices; (2) health conditions and clinical signs that are primary concerns to owners and VP; and (3) barriers to delivery of senior dog health care and ideas for best-practice solutions.

METHODS

Data collection

Preliminary questionnaires

Participants were recruited via social media and press releases from June 16, 2020 to December 16, 2020. We asked DO for views on what it is like to live with and care for an older dog, and VP (surgeons, nurses and physiotherapists) for views on what it is like to work in the care of senior dogs. Those interested were directed to complete preliminary questionnaires (summarised in the Supporting Information Materials S1). Inclusion criteria for DO were being aged at least 18 years, living in the UK, and current or recent possession (within the last 6 months) of a senior or geriatric aged dog. If owners were unsure whether their dog could be classified as senior, they were advised to consult their veterinary surgeon. Inclusion criteria for VP were being aged at least 18 years, living and practising in the UK, the current or recent (within the past 2 years) participation in consultations on senior dog preventive health care/treatment.

Interviews

Interview participants received an information sheet before their interview, provided informed, written consent before the inter-

view and verbal consent during the interview, and were debriefed after the interview. The researcher who conducted most of the interviews and coded the transcripts (LJW) was not trained as a VP (although three members of the research team [ADR, ZB and AJG] were), however, she has a background in animal behaviour and cognition and has personally experienced caring for ageing dogs. The interview schedules were created by the research team and piloted with one DO and one VP.

Interviews (by LJW) with 15 DO from 10 households (with a total of 21 dogs; age range 8 to 17 years, mean: 13 years) in the UK were designed to collect information on DO expectations, experiences, and attitudes to ageing in dogs, as well as their experiences with senior dog preventive health care and treatment, and general level of understanding of healthy and pathological changes in dogs during ageing (see Supporting Information Appendix SA for schedule). Interviewees were purposefully selected to encompass a range of different ages, sex, experience and backgrounds, and senior and geriatric dog ages, breeds, sex and presence of chronic health conditions (Table S1).

Interviews (by LJW and CW) with 11 VP (eight veterinary surgeons, two veterinary nurses and one physiotherapist) were used to obtain information on what senior dog preventive health care advice they offered, their perceptions on the effectiveness of senior wellness clinics, approaches to discussing age-related changes with owners, the helpfulness of online material, and the most important challenges and barriers to senior dog care in practice (see Supporting Information Appendix SB for schedule). Interviewees were purposefully selected to include a range of different ages, sex, experience and practice types (Table S2).

Due to COVID-19 restrictions, the interviews were conducted and recorded online using a proprietary video communication platform (Teams version 1.5.00.9163; Microsoft Corporation), professionally audio transcribed verbatim, and the transcripts were pseudo-anonymised before analysis.

Owner senior dog video/photographic commentaries

Sixty-one DO with the same inclusion criteria submitted one photo or video that depicted an important aspect of living with and caring for a senior dog, along with a written description of what the media captured and why they thought it was important. The video and photographic commentaries were collected using Google Forms from June 16, 2020 to December 13, 2020, and the invitation to participate was disseminated via UK social media and press releases. Participants provided their consent after reading an introductory text.

Data analysis

After pseudo-anonymisation, the interview transcripts and the commentaries from the owner senior dog video and photographic questionnaire were added to the qualitative data analysis software (NVivo; QSR International Pty Ltd, 2018, Version 12) to organise, code and manage the data. According to the

principles of reflexive thematic analysis (please refer to Table S3 for a description of the six phases), each interview was inductively coded after transcription, and interviews were conducted until data saturation was reached (Green & Thorogood 2014, Braun & Clarke 2021). Initial themes were generated and similarities and differences were identified in regular conversation with CW and refined, defined, and named by the wider research team through regular online meetings (Braun & Clarke 2006). This enabled the development of a theoretical interpretation, which focused on informing recommendations for health care provision for senior dogs.

The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the University of Liverpool Veterinary Ethics Committee (Project code VREC925; for the VP interviews), and the University of Liverpool Research Ethics Committee (Project code RETH001077; for the DO interviews and submissions).

RESULTS

Key themes

Four key themes were constructed: “just old age”, barriers to care, trust in veterinary surgeons, and tools to improve health care (Fig 1).

“Just old age”

DO typically described gradual and sometimes difficult to notice changes as their dog aged using mainly lay terminology. Physical and behavioural age-related changes were often linked and DO mostly perceived these signs as being caused by “just old age” (Table S4).

“What she had was aching joints and stiffness of muscles, issues of old age”, DO Interview 7.

“If they are sleeping a lot because they are old, then you tend to think, “Well, they are alright. They are asleep. Nothing wrong with them””, DO Interview 1.

VP felt that the most common issues that senior dogs were brought into practice with included musculoskeletal, dental, cancer, and weight change. DO particularly identified what they termed “doggy dementia” (found in four dogs, three of which had sensory issues), but canine cognitive decline was not as clearly identified by VP as a significant issue in old age dogs. Most DO did not inform their veterinary surgeons of these changes in behaviour and, when they did, some remarked that they did not always know how to treat it:

“I think the dementia, cognitive decline, in dogs is a- We always know it's always happened, but actually deciding to, or wondering how, to treat it or to make it better is relatively new. I did feel that- Our vets were reading up on different things and the Gabapentin did make her less anxious”, DO Interview 7.

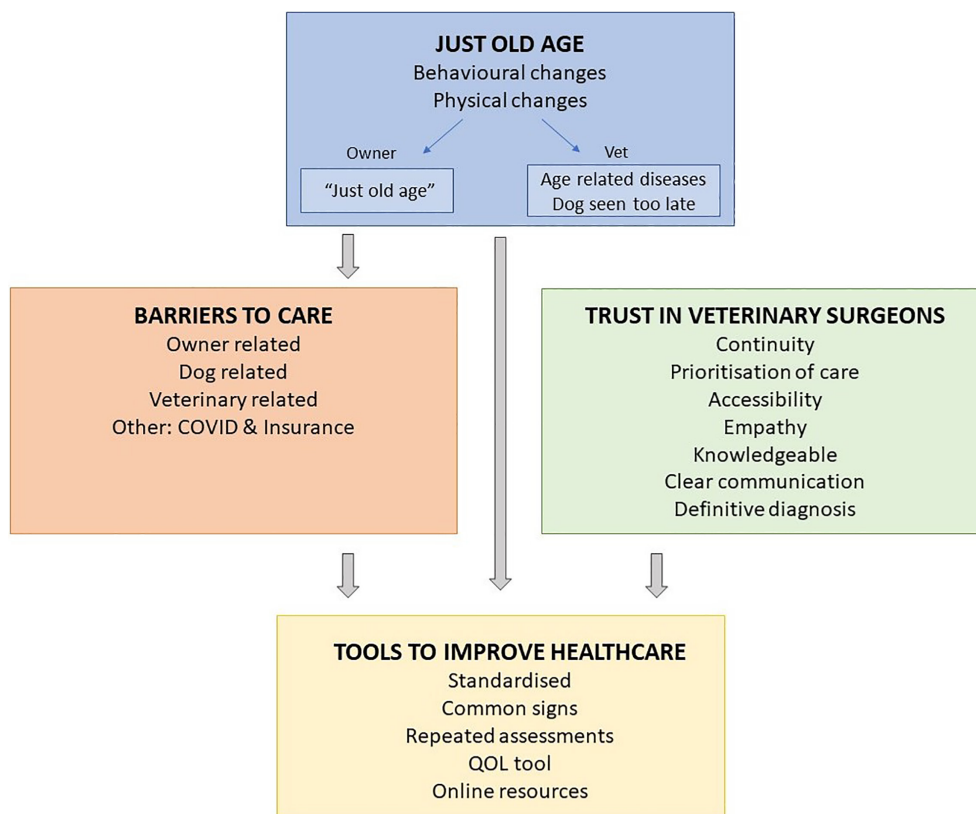


FIG 1. Infographic summarising the four key themes and subthemes, including how the opinions of DO and VP diverge in the “just old age” theme. The arrows between the themes show how the themes are connected; the theme just old age contributed to owner-related barriers to care and tools to improve health care, and trust in veterinary surgeons and barriers to care also contributed to the suggested tools to improve health care

All DO identified changes in their dogs’ body movements and energy levels and VP agreed that musculoskeletal disorders were the most common issue for senior dogs to present to practice. However, they remarked that many DO did not associate changes, for example, walking slowly and a reduced desire to go for walks, with pain or possible arthritis, and thus often did not present their dogs until signs were well advanced:

“Some people that don’t think their dog needs pain relief when, watching it walk in my consult room, I’ve fairly certainly decided that it probably does. I’ve said, “Why don’t you try it for two weeks and if you notice no difference then, fine, your dog doesn’t need pain relief”, VP Interview D.

From the owner’s perspective, it was sometimes difficult to judge when their dog was in pain, as their behaviour was stoical. Although VP may identify pain signs in clients’ dogs, if the DO does not mention anything, they may not point it out, due to time constraints and the difficulties in convincing DO that their pet may be in pain.

Barriers to care

Perceived barriers to care encompassed four subthemes: owner-related, dog-related, veterinary-related and other (which included the Covid-19 pandemic and insurance) (Fig 2).

Owner-related barriers to care subtheme. The most important owner-related barrier perceived by VP was awareness and willingness to act. This encompassed the previously discussed theme of “just old age”, and owners believing clinical signs are “common for the breed”. In fact, some DO believed that their dogs were ageing in a healthy way because they had NOT needed to see a veterinary surgeon:

“I think one thing that I do find is people tended to wear it as a bit of a badge of honour, saying, ‘Oh yes, she’s 14 and she’s never been to see the vet”, VP Interview J.

“The only time she ever went to the vet was to be spayed”, DO Interview 10.

Thus, many VP said that owners brought their dogs in to the clinic too late for them to provide an effective intervention. However, from the perspective of the owner, the main barrier to care for senior dogs was finances:

“I think the other thing that puts people off with elderly animals is, especially if you’re going to have to go down the route of if you’ve got a chronic condition where you need regular medication, it’s how much all that’s going to cost you, and for some people they can’t afford it”, DO Interview 10.

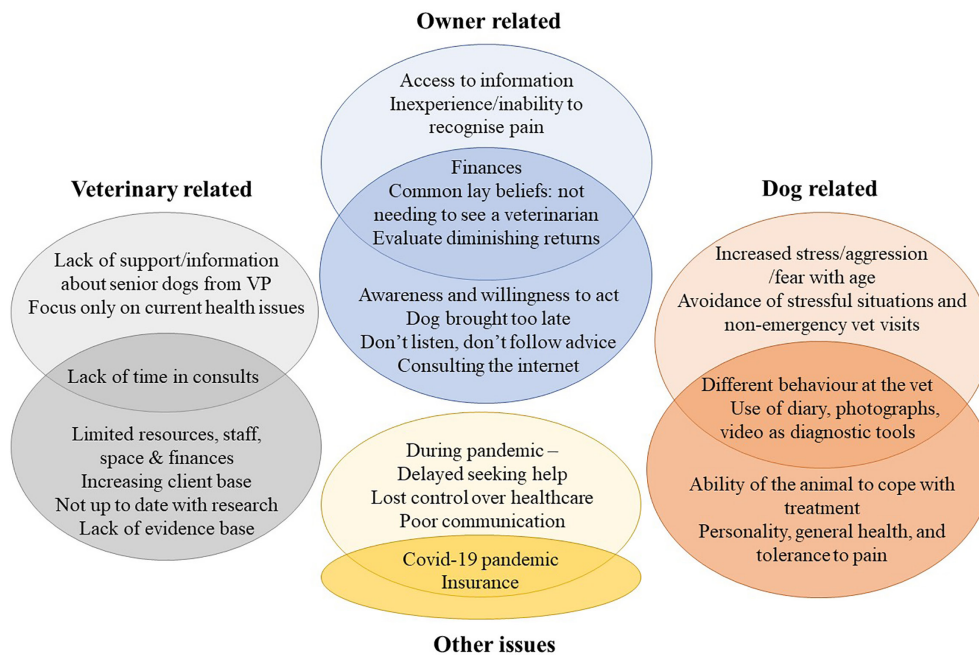


FIG 2. Venn diagram illustrating the barriers to care subthemes for senior dogs identified by DO and VP. The lighter coloured circles represent the DO opinions, the darker circles the VP opinions, and where the circles overlap shows those subthemes where the DO and the VP opinions aligned

Both VP and DO noted that, with senior dogs, there was a need to evaluate diminishing returns; as they are likely to need more costly veterinary treatment but have less time to benefit from it. There comes a point when subjecting an old dog to vaccinations, surgery or invasive diagnostic investigations is not worth the stress with the amount of time the dog has left, and the potential risks involved:

“I think some people do get to a point where they do sort of write their dog off as old. I think certain things like cancelling their insurance and deciding that they don't need to go on walks anymore and they don't need their vaccinations, I think that mind-set changes people's attitude towards their dogs as well”, VP Interview D.

Some owners had no previous experience with senior dogs, and felt their veterinary surgeon did not provide them with the relevant information:

“If I would have known about the Aktivait sooner, it's probably something I would have looked into using, but I didn't know it existed”, DO Interview 2.

In contrast, VP believed that many owners do not listen and do not follow their advice, and often consult the internet as the first port of call:

“I think the hardest part of this job is when people don't believe you and they don't take your advice when you know what's best for that animal because of reading around, if it's your special interest, your training that you've done. [...]”

You try and explain, in the best way that you possibly can, and it's still not effective”, VP Interview J.

Owners' common health-related lay beliefs, which are their subjective informal explanations for health and illness that do not necessarily concur with scientific knowledge (Furnham 1988), were also a barrier. These included believing that long-term medication should be avoided due to side effects, and that regular preventive veterinary visits including vaccination of adult and senior dogs was not necessary:

“We've not actually bothered with vaccinations. [...] Well, we did, but not as regularly as we should have. [...] So, that's why we didn't really come into contact with vets”, DO Interview 10.

Dog-related barriers to care subtheme. Some owners believed that, as their dog aged, they began to behave differently when taken to the veterinary clinic. Taking trips in the car or going to a new place caused significant distress to their dogs, so much so that some would avoid veterinary visits unless it was an emergency:

“He used to love it before, he'd go in, he'd hop and sit on the bench and watch all the other dogs but now he's never happy to be there. So, we try to limit how often we have to take him”, DO Interview 2.

VP were also aware that many dogs would display different behaviour at the clinic in comparison to the home environment and, therefore, both VP and DO recommend using a diary, or

photographs/videos as a diagnostic aid. The ability of the animal to cope with treatment was also considered, in terms of the dog's age, personality, general health, and tolerance to pain:

"In an older dog, I will always explain the options, but I think often owners are less willing or less happy to go down that route, because they feel that, actually, it's not fair on their dog to consider surgery, especially if they don't cope very well, if they get very stressed by the vet", VP Interview G.

Veterinary-related barriers to care subtheme. DO remarked that there was a lack of support for older dogs in general, and VP concentrated on addressing only the signs mentioned by the owner:

"We were very regular with the vets but at no time did anybody say, Look, your dog is now this particular age. These are the issues that he's likely to encounter", DO Interview 4.

"They tended to just focus on the thing that I said was the problem. [...] It was symptom focused", DO Interview 9.

VP felt a key barrier was lack of time, due to a shortage of space and staff, and increasing numbers of clients:

"The problem we have, is, it's a busy practice, and generally speaking, we're running on 10-minute appointments, only because that's the only way to get the number of people in, in the day", VP Interview H.

Some VP had attempted to address the time issue by utilising key questions during consultations to prompt owners to report any changes:

"How is it drinking, how is it eating, how is it urinating, have you seen any changing patterns with that, how's the pooping, peeing, and how's the exercises going, and kind of, you know, are we bright and happy. [...] That would be part of my kind of standard history taking with an older dog, vaccinations or 6-month check", VP Interview A.

VP lamented that practice financial considerations often resulted in fewer free services being offered to owners. Although additional wellness checks for senior dogs were offered, the laboratory fees for the ideal checks required were often thought to be prohibitive. Keeping up to date with the current research was emphasised as a means of addressing any gaps in VP knowledge. However, time availability limited this and suitable evidence did not always exist.

"Vets always want to give the best advice to their clients and their patients, but we can't do that without knowledge. A lot of those things are really based on, maybe, some surveys, but not really good scientific data, which we'd really like to know", VP Interview H.

Other barriers to care subtheme. Some DO delayed seeking help during the COVID-19 pandemic and they perceived that they lost some control over health care decisions for their dogs. The few physical consultations that occurred were conducted without the owner, resulting in poorer communication:

"They more or less took him off you at the door, took him in and he had his injection. [...] I thought the vet would explain a little bit more to me, but the vet was just really intent on giving him his booster. [...] He didn't actually make any comment on the dog's condition at all which surprised me", DO Interview 4.

DO also spoke about the difficulties of insuring older dogs and, when premiums were too expensive, they had to stop. Since aged dogs often suffer from multiple comorbidities, this was thought by VP to be the life stage when dogs needed insurance the most:

"What I find is difficult is that as the dogs get to be eight or nine years of age, suddenly, those insurance premiums are shooting up. [...] So quite often [they] stop it when the dog reaches ten. I think, That's exactly the wrong time to stop your insurance", VP Interview H.

Trust in Veterinary Surgeons

Effective client communication, getting senior dogs into the practice, and maintaining relationships over time were felt by VP to be the most important factors for promoting senior dog health and wellbeing. However, some owners believed that VP that had a financial incentive were selling treatments and medications which were not necessary or needed and did not see offerings such as wellness plans as value for money:

"I think a couple of our vets do have their wellness plan and stuff. But basically, all it is, is just one meeting with the nurse and to sell you the flea and tick treatment and your annual booster free. So, that is not a wellness plan. That is a selling plan, isn't it?", DO Interview 6.

Both DO and VP believed that trust in veterinary surgeons and effective client relationships depended on there being continuity, prioritisation of care of that animal, accessibility, empathy, knowledgeable VP, clear communication and a definitive diagnosis (Table S5). Training and facilitation in effective client communication was identified by VP as a particular need for future improvement:

"The health side definitely is an aspect, but I also think it's more the human behaviour change side and the communication with clients because I think some places, some professionals can be quite guilty maybe of client blaming. [...] I think that more training would only be beneficial", VP Interview J.

Tools to improve health care

In order to address the main barriers to care and to improve trust in veterinary surgeons both DO and VP suggested that it would be useful to issue owners with standardised tools that could be used to assess a senior dog, which detail the most common signs to look out for, when a trip to the veterinary clinic might be necessary, and could guide discussions in consultations:

“It would be great that if your dog went to the vet- or even if a dog is a certain age, there would be like an [information] package that the vet could offer them with things that they could do to make their dogs’ lives better”, DO Interview 3.

“Because it has a format and a workbook and a standardised approach, it actually becomes a very efficient consult [...] Having some form of actual physical resource for them to refer to and talk through”, VP Interview D.

Repeated assessments could be used to detect when changes have occurred and provide consistency across consultations. It was believed that the inclusion of a quality-of-life metric would be important, as would links to good quality online information for DO, to supplement what can be achieved through a short face-to-face appointment:

“Something online that says older dogs, what you need to know, that they can access, read, go back to online or whatever, things to look out for, things to do. I think increasingly people are not necessarily looking for a face-to-face arrangement. I mean we’re now in the scenario where if you want to see a GP, you’re maybe either doing it online or by telephone”, DO Interview 4.

DISCUSSION

Through in-depth interviews with both DO and VP, this study found that DO identified issues in senior dogs that were treatable, but often attributed them to “just old age”. Some DO were reluctant for their senior dog to undergo invasive procedures (such as blood tests), long-term pain relief, or be vaccinated or taken for a check-up, which may prevent VP from making a firm clinical diagnosis, and often results in dogs being presented at an advanced stage, when treatment becomes more challenging. VP and DO believed that owners increasingly view their dog as less of an investment opportunity as they age in terms of delivering health care, as they are likely to require more costly treatment, but may benefit less from it, as they do not have long left to live. DO considered the greatest barrier to senior dog health care to be finances, and VP, owner awareness and willingness to act. Health conditions that were of primary concern to DO mostly aligned with the key conditions mentioned by VP apart from “doggy dementia” on behalf of DO and “dental issues” on behalf of VP. The importance of an effective relationship and trust between DO

and VP to provide the best senior dog health care was strongly emphasised. DO and VP ideas for best-practice solutions for some of the most important barriers included a simple questionnaire to flag potential issues to then be discussed with VP and evidence-based online information for DO.

Some physical and behavioural deterioration is considered a normal part of the ageing process; however, a proportion of the dog population suffer from a severe decline which is considered pathological, which affects their day-to-day life (Szabó *et al.* 2016). VP can determine which dogs are affected by considering the dog’s life expectancy (according to breed and/or size/weight), diagnosing any sensory issues or chronic diseases, and by comparing the dog to an established baseline (preferably using validated behavioural and physical scales). In reference to the owner’s ability to determine what healthy ageing constituted for their dog, and what might necessitate a veterinary visit, previous studies have determined that even for behaviour experts, it is difficult to accurately define behaviours associated with healthy ageing *versus* disease (Salvin *et al.* 2011, Overall 2012, Salvin *et al.* 2012, Hammerle *et al.* 2015); therefore, expecting owners to be able to do this, without clear guidance is problematic. Similar to previous studies, our owners noticed in particular increased sleeping, loss of hearing or sight, stiffness or lameness and “slowing down”, but these clinical signs were often not reported to VP (Davies 2012), indicating the need for further questioning of owners by VP during routine health checks. Furthermore, our data also suggests that older dogs are in general vaccinated less frequently than younger dogs (Sánchez-Vizcaino *et al.* 2018), and unless they are being treated for a chronic condition, they are presented less frequently to practice, even when owners perceive there is a problem, as evidenced by their reluctance due to costs and the dog being presented late in the course of disease. Owners who proactively bring their dog to regular check-ups may facilitate the early diagnosis of new health conditions, as opposed to when DO reactively respond to their dog’s health care needs, and VP are completely reliant on the owner recognising a problem in their dog and bringing them in for treatment as soon as possible. Even then, if the owner did not explicitly describe the problem, and/or if the dog did not present with the issue in the clinic (as they “mask” their pain when in stressful situations such as at the veterinary surgery), some VP did not have the time or motivation to investigate further.

Canine cognitive dysfunction (CCD) is a pathology resulting in compromised behavioural functioning in aged dogs, which affects their day-to-day life (Szabó *et al.* 2016, Urfer *et al.* 2021). Studies detailing the current rate of diagnosis of CCD in UK veterinary surgeries, including the range of signs, and concurrence with sensory problems, are currently lacking. This may explain why we observed that VP seemed less clear and/or concerned about how to deal with these behavioural changes than other more physical conditions. In addition, some owners whose dogs showed signs of CCD did not mention them to VP, electing instead to care for them at home, and were unaware that treatments to halt or slow the progression of CCD exist.

This study highlighted the importance of the VP–DO relationship in developing trust to ensure that VP advice is sought and acted upon. This was more likely when owners experienced continuity, prioritisation of care, clear communication, and an easily accessible, knowledgeable, and empathic veterinary surgeon. Previous research has also suggested that veterinary surgeons may improve outcomes by taking a more relationship-centred approach to communication with their clients (Bard *et al.* 2017). Joint informed decisions are reached through the VP understanding the client's current knowledge, tailoring information and educating clients about their options (Janke *et al.* 2021).

Our DO believed that there was a lack of support for older dogs in general from VP. A previous study also found that veterinary surgeons seldom described how to recognise or prevent conditions which are common in older pets during consultations before these conditions arose (Belshaw 2017). Detailed senior health care plans or wellness clinics can be difficult to implement in practice due to the extra time needed for consultations, additional costs of diagnostic tests, and the difficulty persuading an owner to attend with an apparently “healthy” senior pet (Critchley 2014). Furthermore, as more owners are turning to the internet for additional advice when their dog shows age-related signs or has been diagnosed with a condition by a veterinary surgeon, the importance of accurate educational websites has grown (Oxley *et al.* 2017). As such, investment in evidence-based, reliable, centralised online veterinary information where owners can be informed about physical and behavioural signs of age-related conditions and their treatment would be a valuable resource.

The current study identified many barriers to the delivery of senior dog health care, and incorporated DO and VP ideas for best-practice solutions for some of the most important barriers. Information booklets/leaflets about the most common signs of age-related diseases to look out for, a questionnaire that can be completed regularly to build up a baseline and allow owners to visualise changes in their dog over time, quality of life tools and evidence-based online information for owners, as well as the increasing availability of telehealth negating the need for the dog to always visit the practice, were all suggestions.

Findings from this study can be used to support the design of new resources to facilitate communication between DO and VP in key areas, aiming to:

1. Encourage DO to attend wellness checks and discussion of preventive health care (including treatable conditions) geared towards senior dogs, without the perceived pressure of a need for booster vaccinations.
2. Save consultation time by getting DO to complete a questionnaire in advance that includes key questions that prompt them to mention observations they may otherwise not have.
3. Provide DO and VP with internet links to further information.

The current study provides an important first step in exploring expectations, experiences, and attitudes to ageing in dogs, but has some limitations. First, whilst qualitative studies have the advantage

of providing an in-depth insight into attitudes and opinions, the direct application of this research to other populations should be performed with caution. Second, interviewees were informed that the research was specifically about senior dogs and were often personally interested and invested in their care. As a result, these participants might represent a particularly conscientious population, and may not reflect the views of the general VP and dog owning public. Third, male participants were more difficult to recruit, a problem seen with many questionnaire and qualitative studies in the human–animal interaction field (Wilson & Barker 2003, Herzog 2007). Fourth, the COVID-19 pandemic meant that interviews were conducted online, which had the advantage of widening the geographical scope of the study. However, there were also disadvantages compared to face-to-face interaction in the use of body language, interpretation of meaning, and building rapport and smooth discussion (Lo-Lacono *et al.* 2016), as well as possibly lacking more diverse participant groups (e.g., groups from nonprofessional backgrounds and people with low levels of education and/or computer literacy) (Archibald *et al.* 2019).

CONCLUSION

This is the first qualitative description of senior dog health care from the point of view of both DO and VP in the UK, however similar results were found in Belshaw *et al.* (2020a) in a qualitative study of dogs of all ages suffering from osteoarthritis, indicating the generalisability to a different population. Significant gaps in VP and DO communication were identified requiring urgent intervention. We found that opportunities to educate owners on what behavioural and physical signs represent “healthy” ageing, and what is pathological are being missed, due to lack of time, education, and in some cases motivation. How a DO decides when to bring their dog to the veterinary clinic is dependent on their previous experience and knowledge, and their relationship with their VP. As most did not feel prepared for their dogs' ageing, the possibility of reduced welfare in aged dogs is increased. The development of a new guidance tool could address these gaps, to guide on best-practice discussions in consultations with senior dogs and encourage more owners to seek veterinary advice.

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Author contributions

L. J. Wallis: Conceptualization (equal); data curation (lead); formal analysis (lead); funding acquisition (equal); investigation

(lead); methodology (equal); project administration (lead); supervision (supporting); validation (equal); visualization (equal); writing – original draft (lead); writing – review and editing (equal). **A. D. Radford:** Conceptualization (supporting); funding acquisition (supporting); methodology (supporting); writing – review and editing (equal). **Z. Belshaw:** Funding acquisition (supporting); methodology (supporting); validation (supporting); writing – review and editing (equal). **J. Jackson:** Writing – review and editing (equal). **E. Kubinyi:** Funding acquisition (supporting); methodology (supporting); validation (supporting); writing – review and editing (equal). **A. J. German:** Funding acquisition (supporting); methodology (supporting); validation (supporting); writing – review and editing (equal). **C. Westgarth:** Conceptualization (lead); formal analysis (equal); funding acquisition (lead); investigation (equal); methodology (equal); project administration (supporting); resources (lead); supervision (lead); validation (equal); visualization (equal); writing – original draft (equal); writing – review and editing (equal).

Conflict of interest

AJG is an employee of the University of Liverpool whose position is funded by Royal Canin. AJG has also received financial remuneration and gifts for providing educational material, speaking at conferences, and consultancy work.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Data S1. Supporting Information.