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Veterinary surgeons', veterinary nurses' and owners' experiences of feline telemedicine consultations during the 2020 COVID-19 pandemic

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1 **Veterinary surgeon, veterinary nurse and owners' experience of feline**
2 **telemedicine consultations during the 2020 COVID-19 pandemic**

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17 and MSD Animal Health for providing additional funding.

18

19 **Abstract**

20 **Background**

21 There has been increasing provision of veterinary telemedicine consultations, particularly during the
22 COVID-19 pandemic; however, little evidence currently exists examining these remote consultations.
23 The aim of this cross-sectional study was to explore veterinary and cat owner experiences of
24 telemedicine consultations during the pandemic.

25 **Methods**

26 Two questionnaires, one aimed at veterinary professionals and one at cat owners, were launched in
27 September 2020. Questions explored the type of consultation conducted remotely, perceived
28 advantages and disadvantages of telemedicine, and the role of telemedicine in the future of veterinary
29 practice.

30 **Results**

31 Responses were received from 242 veterinary professionals and 98 owners with experience of
32 telemedicine. Monitoring and advice consultations were felt to be most suited to telemedicine. Reduced
33 stress for owner/cat were seen as advantages of telemedicine, while lack of clinical examination and risk
34 of misdiagnosis were viewed as disadvantages. Most respondents (85.7% (n=84/98) of owners; 67.4%
35 (n=163/242) of veterinary professionals) felt practices should continue to offer telemedicine
36 consultations.

37 **Conclusion**

38 With increasing pet ownership and practice workload, telemedicine may play a crucial role in the future
39 of veterinary practice. Future work should focus on a strategic approach to feline telemedicine,
40 integrating it alongside face-to-face visits and developing technologies to maximise its advantages.

41 **Introduction**

42 Telemedicine can be described as ‘the use of electronic communication and information technologies to
43 provide clinical healthcare remotely’¹, with the provision of veterinary services via video link, telephone,
44 text and any other remote means examples of this. Providing virtual care for veterinary patients is not a
45 new concept, with technology used to enable communication between veterinary surgeons for many
46 years. For example, phone lines were used in 1980 to transmit electrocardiograms to cardiologists,
47 allowing veterinary patients in primary care to benefit from their expertise remotely². The use of
48 technology to enable remote communication between veterinary surgeons and clients has grown in
49 recent years, and the COVID-19 pandemic saw many veterinary surgeons in the UK and beyond
50 providing telemedicine on a wider scale, in order to minimise contact.

51 Telemedicine is frequently offered in human healthcare, with a larger body of evidence surrounding its
52 use. Around 15% of physicians used telemedicine, with those working in larger practices or in non-
53 metropolitan areas using it more frequently³. Telemedicine has been credited with improving access to
54 care for those in rural communities, with transport issues or where there is a shortage of providers⁴. It
55 has also been suggested that telemedicine may provide a reliable means of assessing patients, even
56 when considering the absence of a clinical examination. For example, comparison of telemedicine and
57 bedside exams when assessing febrile children and children with respiratory distress found good to
58 excellent agreement in all cases⁵. Paediatric care is often considered a useful comparator for veterinary
59 consultations, and the veterinary surgeon-client-patient interaction may more closely reflect the
60 physician-parent-child interaction than a straightforward physician-patient interaction. However, the

61 relative importance of the clinical examination for veterinary compared with human patients remains
62 unclear, so caution should be exercised when extrapolating these findings to veterinary practice. In
63 addition, concerns have been raised that prescribing practices differ significantly between telemedicine
64 and face-to-face consultations. One study⁶ found that 52% of children with acute respiratory infections
65 were prescribed antimicrobials during telemedicine consultations, compared with just 32% during
66 primary care visits.

67 Evidence relating to the use of telemedicine in veterinary practice is more limited; however, some
68 evidence of the provision of remote care does exist. Consultations by board-certified veterinary
69 behaviourists for the treatment of canine separation anxiety⁷ and aggression⁸ were conducted either
70 remotely via fax or in-person. Significant improvements were seen in both groups, with no significant
71 difference between remote and in-person consultations. Other studies have found benefits of
72 telemedicine in other scenarios, for example post-neutering checks in dogs⁹; however, it is unclear
73 whether these findings apply across other types of consultation, and for other species.

74 Despite the increase in telemedicine provision in general veterinary practice, there is still relatively little
75 evidence documenting veterinary surgeon and client experiences of telemedicine consultations¹⁰. The
76 aim of this study was to explore veterinary surgeon/veterinary nurse (VN) and cat owner experiences of
77 feline telemedicine consultations during the COVID-19 pandemic, and gather opinions of whether, and
78 how, telemedicine should be offered by veterinary practices for feline patients in the future.

79 **Materials and Methods**

80 **Population of interest**

81 The target population for the veterinary questionnaire consisted of veterinary surgeons and VNs with
82 experience of at least one feline telemedicine consultation during the COVID-19 pandemic. Similarly, the

83 target population for the owner questionnaire consisted of cat owners or carers with experience of at
84 least one telemedicine consultation during the COVID-19 pandemic. During the questionnaire,
85 telemedicine was defined as 'veterinary/VN consultations which are not 'in person' but instead have
86 been conducted by video, phone or email'. Respondents could take part from anywhere in the world,
87 had to be at least 18 years old and could only complete one questionnaire per household.

88 **Questionnaire design**

89 Both the veterinary and owner questionnaires were made up of 14 questions. Initial questions asked
90 basic demographic data (*i.e.*, whether a cat owner, breeder, shelter worker etc. for the owners
91 questionnaire, whether a veterinary surgeon, VN etc. for the veterinary questionnaire, and country
92 resided in for both). Respondents were then asked whether they had any experience of telemedicine
93 during the COVID-19 pandemic, to ensure they met the inclusion criteria, with those answering no
94 directed out of the survey. The remaining questions focused on method of telemedicine (*e.g.*, video
95 consultation, telephone consultation etc.), the type of consultation (*e.g.*, emergency assessment,
96 preventative healthcare, routine check up, *etc.*), the perceived advantages/disadvantages of
97 telemedicine and whether telemedicine should continue to be offered in the future. The questions took
98 a variety of forms, including numerical scoring, selecting a single option from a drop-down menu,
99 multiple choice and free text boxes. The initial draft of the questionnaire was piloted with a small group
100 of colleagues and any suggested amendments made prior to launch of the final questionnaire. The final
101 questionnaire was hosted on the Vet Professionals website in full compliance with General Data
102 Protection Regulation (GDPR) (EU) 109 2016/679.

103 **Questionnaire distribution**

104 The owner survey was launched on 1st September 2020 and the veterinary survey was launched to
105 members of VetPartners practices on 3rd September 2020, then to the wider veterinary profession on

106 15th September 2020. An invitation to complete the relevant survey was emailed to the owners and
107 veterinary surgeon s/VNs on Vet Professionals database, and was also shared with small animal
108 practices within the VetPartners group by email and internal communications e.g. Facebook. The Vet
109 Professional database contains around 2000 cat owners, veterinary surgeons and VNs from around the
110 world, though around half of the owners in this database are from the UK, while VetPartners has around
111 2500 staff in small animal practice teams across the UK. After the initial invite to complete the relevant
112 survey, 3 further email reminders were sent for both the owners and veterinary surveys between the
113 initial launch and 20th October 2020. Snowball sampling, where existing respondents help to recruit
114 further respondents by sharing the survey with their acquaintances, was also conducted. Surveys were
115 also promoted on social media platforms (e.g. Facebook and Twitter) alongside promotion by
116 International Cat Care, Cats Protection and Vet Times. Surveys were closed to all respondents on 1st
117 December 2020. Data collected from the survey were collated and stored using FormSite (Vroman
118 Systems) before downloading to Microsoft Excel for analysis.

119 **Data management and analysis**

120 Data processing and descriptive statistics were performed in Microsoft Excel. Responses around type of
121 telemedicine were complex with many selecting multiple combinations of modalities, so these were
122 recoded into simplified categories representing each component of the interaction e.g. a respondent
123 who said they used phone consultations in combination with sharing videos would be recoded into both
124 the 'phone consultation' and 'sharing videos' categories. Free text responses to questions on the
125 advantages and disadvantages were scanned for common themes and then recoded into set categories.
126 Each response could be included in multiple categories where applicable e.g. a vet who stated that
127 disadvantages of telemedicine were not being able to examine the patient and worrying that they had
128 missed something would be recoded into both 'inability to perform complete clinical examination' and
129 'concerns about misdiagnosis and/or delayed diagnosis'.

130 **Ethical approval**

131 Approval was obtained from the Human Ethical Review Committee (HERC) at the Royal (Dick) School of
132 Veterinary Studies, The University of Edinburgh for the collection of data through online questionnaires
133 of veterinary surgeons/VNs and cat owners, and subsequent analysis of this data (approved 24th August
134 2020, reference: HERC_558_20 and HERC_559_20).

135 **Results**

136 **Basic data**

137 After data cleaning there were 196 responses from cat owners/carers and 269 responses from
138 veterinary surgeons/VNs. Of these, n=98/196 (50.0%) cat owners and n=242/269 (90.0%) veterinary
139 surgeons/VNs had experience of telemedicine consultations; these responses were taken forward for
140 further analysis. Of these 98 cat owners, 39 (39.8%) had experienced one telemedicine consultation and
141 59 (60.2%) had experienced more than one, with 17 (17.3%) experiencing 5 or more telemedicine
142 consultations (median 2; Interquartile Range 1-3).

143 **Demographics**

144 Of the 98 respondents to the owner survey, 97 (99.0%) were cat owners, 3 (3.1%) were cat breeders and
145 20 (20.4%) also worked in animal care (including cattery worker, veterinary profession *etc.*). Most
146 respondents to the veterinary survey were veterinary surgeons (n=218/242; 90.1%), while the remaining
147 24 (9.9%) were VNs.

148 Most respondents were from the UK (n=83/98 (84.7%) cat owners; n=204/242 (84.3%) vets/VNs), with
149 the remaining respondents being from outside the UK (n=15/98 (15.3%) cat owners; n=38/242 (15.7%)
150 vets/VNs). In total, 21 different countries were represented.

151 Half of veterinary respondents worked in a corporately-owned practice (n=121/242; 50.0%), with 84
152 (34.7%) working in an independently-owned practice, 10 (4.1%) in a charity-owned practice, 7 (2.9%) in
153 a referral practice, 4 (1.7%) in a University-owned general practice, 18 (7.4%) for a specialist
154 telemedicine service and 10 (4.1%) selected 'Other'. Just over a quarter of responses were from vets or
155 VNs working in VetPartners practices (n=71/242; 29.3%), with the rest from other practices.

156 **Method of telemedicine**

157 Phone consultations were the method of telemedicine experienced by the largest proportion of cat
158 owners, while sharing photos and phone consultations were used by almost all veterinary respondents
159 (Figure 1). Veterinary respondents using video consultations utilised a range of platforms, including
160 bespoke video consult platforms (n=55/113; 48.7%), WhatsApp (n=29/113; 25.7%), Zoom (n=25/113;
161 22.1%), Facetime (n=13/113; 11.5%) and Skype (n=11/113; 9.7%).

162 In total, 36 respondents to the owner survey, and 223 respondents to the vet/VN survey had
163 experienced more than one method of telemedicine. Around half of these owners and vets said their
164 preferred method involved a phone consultation, while a third of owners and around half of vets said
165 their preferred method involved sharing photos between the owner and the practice (Figure 2).

166 **Type of consultation**

167 Respondents to the owner survey had most frequently received a telemedicine consultation for
168 monitoring or management of an ongoing health problem (Figure 3), though a range of different
169 consultation types were represented among the respondents. Most respondents to the veterinary
170 survey had used telemedicine consultations for monitoring/management of an ongoing health problem,
171 new non-emergency illnesses, advice and repeat prescriptions, while just over half had used
172 telemedicine for emergency assessment and preventative healthcare (Figure 3).

173 Of the respondents to the veterinary survey with experience of telemedicine for more than one type of
174 consultation (n=227/242; 93.8%), most felt that the success of the telemedicine consultation varied with
175 the type of consultation (n=164/227; 72.2%), while 39 (17.2%) felt the consultation type did not make a
176 difference, 20 (8.8%) were not sure and 4 (1.8%) selected 'other'.

177 Of the veterinary respondents who stated success of telemedicine varied with type of consultation
178 (n=164), most selected consultations to monitor/manage an ongoing health problem as well suited to
179 telemedicine followed by repeat prescription requests, then advice (Figure 4).

180 **Cats versus other species**

181 Just over half of veterinary respondents (n=128/242; 52.9%) felt the species of the animal made no
182 difference to the success of telemedicine consultations. A further 57 (23.6%) felt that telemedicine
183 consultations were less successful for cats compared with other species, 27 (11.2%) felt they were more
184 successful for cats, and 30 (12.4%) were not sure. Free text comments from those who felt telemedicine
185 was less successful for cats often focused on the owner ability to identify illness in and handle their cats
186 ("they tend to be less compliant with owner"; "cats are so subtle that it's easy for owners to miss
187 signs"), while those who felt it was more successful for cats often focused on the stress aspect ("Cats are
188 much more relaxed at home" "feline clients embraced it more and were more relaxed").

189 **Advantages/disadvantages of telemedicine**

190 Owners

191 Most owners (n=73/98; 74.5%) described at least one advantage of telemedicine for their cat, while
192 around a quarter (n=25/98; 25.5%) felt there were no advantages for the cat. The advantage most
193 frequently mentioned was less stress for the cat compared with a face-to-face consultation (n=55/98;
194 56.1%), followed by avoiding transportation (n=32/98; 32.7%). Being assessed more quickly (n=15/98;

195 15.3%) was also mentioned by some owners, and some mentioned avoiding the need to spend time in
196 the practice waiting room (n=7/98; 7.1%).

197 Most owners (n=68/98; 69.4%) also described one or more disadvantages of telemedicine for the cat,
198 while 30 (30.6%) felt there were no disadvantages to telemedicine for their cat. The most frequently
199 mentioned disadvantage was lack of clinical examination (n=50/98; 51.0%), followed by delays in
200 receiving a diagnosis or treatment (n=18/98; 18.4%) and the risk of misdiagnosis (n=17/98; 17.3%).

201 Most owners (n=74/98; 75.5%) listed one or more advantages of telemedicine for themselves, while 24
202 (24.5%) felt there were no advantages. Convenience was the most frequently mentioned advantage
203 (n=48/98; 49.0%), followed by time benefits (n=24/98; 24.5%) and less stress for themselves (n=24/98;
204 24.5%). Ten owners (n=10.2%) mentioned safety of not having to visit in person during a pandemic and
205 6 (6.1%) mentioned reduced cost of the consultation. Most owners (n=71/98; 72.4%) identified at least
206 one disadvantage for themselves from telemedicine, with 27 (27.6%) not listing any disadvantages. The
207 most common disadvantage given was difficulty communicating with the vet (n=43/98; 43.9%), followed
208 by a feeling that diagnosis and/or treatment were delayed by the process (n=29/98; 29.6%). Some also
209 felt that the time taken and cost of telemedicine (both n=10/98; 10.2%) were disadvantages, while some
210 found telemedicine consultations more stressful for themselves (n=9/98; 9.2%).

211 Vets/VNs

212 Almost all respondents to the veterinary survey (n=238/242; 98.3%) identified at least one advantage of
213 telemedicine consultations, with only 4 (1.7%) stating there were no advantages. The most common
214 advantage mentioned was less stress for the cat (n=192/242; 79.3%), followed by reduced need for
215 unnecessary travel to the surgery (n=76/242; 31.4%), then ability to assess the animal's behaviour in
216 their home environment (n=67/242; 27.7%). Reduced stress for the owner (n=59/242; 24.4%), reduced
217 time pressure (n=40/242; 16.5%) and convenience for the owner (n=37/242; 15.3%) were also

218 frequently mentioned. Some respondents also mentioned improved communication with owners
219 (n=28/242; 11.6%), safety (n=27/242; 11.2%) and cost advantages (n=4/242; 1.7%) of telemedicine.

220 Almost all respondents to the veterinary survey (n=236/242; 97.5%) identified one or more
221 disadvantages to telemedicine, with only 6 (2.5%) listing no disadvantages. The most common
222 disadvantage given was inability to perform a complete clinical examination (n=208/242; 86.0%),
223 followed by concerns about misdiagnosis and/or delayed diagnosis (n=68/242; 28.1%), communication
224 difficulties (n=59/242; 24.4%) and technical difficulties (n=52/242; 21.5%). Other disadvantages
225 mentioned were increased time pressure (n=16/242; 6.6%); challenges around costs for owners
226 (n=14/242; 5.8%) and inability to administer injectable treatments (n=12/242; 5.0%).

227 Advantages vs disadvantages

228 Of the 98 respondents to the owner survey, 37 (37.8%) said the advantages of telemedicine outweighed
229 the disadvantages, while 33 (33.7%) said they did not and 28 (28.6%) were not sure. Only around a
230 quarter of respondents to the veterinary survey (n=64/242; 26.4%) felt the advantages of telemedicine
231 outweighed the disadvantages, while 124 (51.2%) said they did not and 54 (22.3%) were not sure.

232 **Future of telemedicine**

233 Most owners (n=84/98; 85.7%) felt that practices should continue to offer telemedicine as one option in
234 the future, while 8 (8.2%) felt practices should not offer this option and 6 (6.1%) were not sure.
235 However, around half of owners (n=50/98; 51.0%) stated that they would still prefer a face-to-face
236 consultation over a telemedicine consultation, while 27 (27.6%) said they would prefer a telemedicine
237 consultation, 3 (3.1%) were unsure, and 18 (18.4%) selected 'Other', with some of these suggesting a
238 combination of the two, or that it may depend upon the reason for the consultation.

239 Most Vets/VNs (n=163/242; 67.4%) also felt telemedicine consultations should be an option, where
240 appropriate, in the future, while 40 (16.5%) did not think these should be offered and 39 (16.1%) were
241 not sure. Most vets/VNs (n=224/242; 92.6%) felt that it would be appropriate for MRCVS registered
242 veterinary surgeons to conduct telemedicine consultations and 192 (79.3%) felt that it would be
243 appropriate for qualified VNs to conduct these consultations. A smaller number also felt that these
244 consultations could be conducted by veterinary students (n=32/242; 13.2%) or trainee VNs (n=28/242;
245 11.6%) under appropriate supervision, and 9 (3.7%) selected 'other'.

246 **Discussion**

247 The results of the current study represent an important addition to the existing evidence base on
248 telemedicine, at a time of much change in the UK veterinary profession where new strategies may be
249 needed for managing a shortage of veterinary surgeons and VNs, alongside a growing pet population. To
250 the authors' knowledge, this study is novel in being the first to focus solely on feline telemedicine
251 consultations, considering both the experience of their owners and of the vets/VNs involved in their
252 care. The RCVS Professional Code of Conduct for Veterinary Surgeons references telemedicine, with one
253 section of the supporting guidance stating 'specific advice provided remotely, for example via phone or
254 video-link with or without additional physiological data (commonly referred to as telemedicine or
255 telehealth), should only be given to the extent appropriate without a physical examination of the
256 animal. The more specific the advice, the more likely it is that the animal's owner should be advised to
257 consult a veterinary surgeon in person for a physical examination'¹¹. While small animal veterinary
258 practice saw a large scale move to telemedicine during the pandemic out of necessity for the health and
259 safety of staff and clients, this highlights that there may be a role going forwards for telemedicine under
260 certain scenarios. The crucial role of telemedicine in managing the increasing workload faced by UK
261 veterinary practices has recently been highlighted by some in the charity sector¹².

262 A previous study¹³ conducted a survey of veterinary surgeons to examine their use of and attitudes
263 towards communication technologies. The results suggested telemedicine may be more appropriate for
264 some scenarios than others, with post-operative checks, monitoring of diabetics and nutritional
265 counselling all suggested as potentially appropriate candidates for telemedicine. This echoes the
266 findings of the current study, in which respondents to the veterinary survey highlighted telemedicine as
267 best suited to monitoring, advice and repeat prescription consultations, and previous findings that
268 telemedicine was most frequently used for ongoing case management¹⁴. Further research could focus
269 on examining the success of telemedicine consultations for specific scenarios, to identify where this
270 could provide a useful, and potentially more efficient, alternative to face-to-face consultations. Some
271 work has already been done in this area, with dogs randomised to receive a face-to-face or virtual
272 recheck following routine neutering⁹. While owners from both groups were satisfied with their recheck,
273 owners in the virtual group noted that their check took less time and their dogs were less stressed than
274 if they had had to travel to the clinic, with no dogs in this group suffering a complication requiring a
275 subsequent visit to the clinic. As this study was limited to 30 dogs in total, it is unclear whether these
276 results will be applicable to all clinics, other species and other scenarios, but the results suggest that
277 further work to explore the benefits of telemedicine are justified.

278 Interestingly, respondents to both the owner and veterinary questionnaires had frequently used
279 telephone consultations, a finding echoed by recent research¹⁵, and viewed it as their preferred method
280 of telemedicine, rather than email or video consultations. Veterinary respondents also rated the sharing
281 of photos as a preferred method more frequently than owners. Some owners cited technical problems
282 as a disadvantage to telemedicine, suggesting technology may be a barrier for some owners, which may
283 be a particular problem for the sharing of photos and videos, or the use of video consultations.
284 Identifying ways to increase access or ease of use of these technologies for owners may help to optimise
285 the success of telemedicine going forwards.

286 In terms of the advantages and disadvantages of telemedicine, the results of the current study found
287 reasonable consistency between owners and veterinary professionals. Both groups highlighted reduced
288 stress to both the patient and the owner, which are particularly important in light of the findings of the
289 Bayer veterinary care usage study, where cat owners were more likely to perceive veterinary visits as
290 stressful for themselves and their pets than dog owners¹⁶. The current study also highlighted other ways
291 that telemedicine could reduce stress, such as no time travelling or time in the waiting room. As a
292 naturally solitary species, cats may be particularly prone to stress associated with the veterinary visit,
293 with this often making a meaningful clinical examination difficult, and potentially affecting the results of
294 investigations, such as blood pressure monitoring¹⁷. However, there was also consensus on the
295 disadvantages of telemedicine, with inability to perform a physical examination mentioned most
296 frequently, and concerns about a delayed or incorrect diagnosis common among both owners and
297 veterinary professionals.

298 These findings highlight the perceived importance of the clinical examination in the diagnosis, treatment
299 and management of disease in veterinary patients. Previous work examining small animal consultations
300 in general practice found that cats were more likely to receive a full clinical examination, rather than a
301 more focused one, than dog or rabbit patients, and that full examinations are more likely to lead to
302 discussion about additional health problems than a more focused clinical examination¹⁸. However, the
303 role of clinical presentation, history taking and consultation type in influencing the type of clinical
304 examination performed is unclear here. It has been shown that preventive healthcare consultations
305 were also more likely to involve a full clinical examination than consultations for a particular health
306 problem¹⁸, yet more vets in the current study felt preventative healthcare consultations were more
307 suitable for telemedicine than consultations for an emergency or non-emergency illness.

308 As solitary predators who, depending on lifestyle, may spend more time outside the house and away
309 from their owners, cats may be better able to hide signs of illness and cat owners may feel less confident

310 in providing a thorough clinical history than owners of more social species such as dogs. Interestingly,
311 while just over half of veterinary respondents felt the species made no difference to the success of
312 telemedicine, those that did feel the species made a difference more frequently cited cat consultations
313 as being less successful than dog consultations than vice versa, suggested the trade-off of reducing
314 stress versus lack of clinical examination may be perceived differently for different species by some.
315 Identifying scenarios where a face-to-face physical examination is needed, while also trying to maximise
316 the information obtained during a telemedicine consultation, could help to successfully integrate
317 telemedicine, where appropriate, into modern veterinary medicine. For example, technologies and
318 resources to facilitate the sharing of photos and videos, optimise clinical history taking and collect data
319 from smart devices (e.g., activity monitors and smart feeders/drinkers), could help to address many of
320 the disadvantages of telemedicine raised in this study.

321 One limitation of the current study is that it focused on telemedicine during the COVID-19 pandemic,
322 where a rapid switch was made from face-to-face consultations to telemedicine out of necessity and
323 safety for staff and clients. As a result, the experiences of telemedicine reported here may not reflect
324 the reality of telemedicine conducted in a more planned, strategic way, so future work could aim to find
325 ways in which the benefits of telemedicine could be utilised, where appropriate, while minimising the
326 drawbacks. With the majority of both owner and veterinary respondents in the current study feeling
327 that practices should continue to offer telemedicine in the future, finding a way to effectively integrate
328 telemedicine, where appropriate, into modern veterinary practice, could be an important priority for the
329 profession in the near future. In addition, the majority of respondents were from the United Kingdom,
330 so it is unclear how closely the opinions gathered during this study reflect those globally. Recoding of
331 free text on the advantages and disadvantages of telemedicine required some degree of interpretation,
332 which may be a source of bias, but categories were kept broad to minimise over-interpretation of
333 responses. A further limitation is the conducting of the survey during the COVID-19 pandemic, when

334 veterinary practices had very heavy workloads, may have meant the respondents able to complete the
335 survey were not representative of the wider profession during this time. A separate link was launched
336 for respondents from VetPartners practices so that this data could also be used for internal audit and
337 quality improvement; however, this proved difficult as only a small number of these responses were
338 received.

339 In conclusion, telemedicine may play a crucial role in the future of feline veterinary care. In the wake of
340 the COVID-19 pandemic, future efforts should focus on a strategic approach to feline telemedicine,
341 identifying scenarios where it can be used for maximum benefit to veterinary practice efficiency, staff
342 morale and patient welfare. The findings from this study suggest consultations involving feline patients
343 highly vulnerable to stress, particularly in the monitoring and management of ongoing health problems,
344 may be potential candidates for the use of telemedicine.

345 **Data availability statement**

346 Due to privacy and ethical concerns, supporting data is not publicly available, as participants of this
347 study did not agree for their data to be shared beyond the research team.

348 **Author contributions**

349 SC and RD designed and distributed the survey. DGM assisted with the ethical approval process. NR
350 performed data cleaning and analysis. All authors contributed to the manuscript.

351 **Conflict of Interest Statement**

352 The authors received financial support from MSD Animal Health. However, the topic of study, study
353 design, statistical analysis, interpretation of the results, decision to publish and writing of the
354 manuscript were undertaken independently of MSD Animal Health.

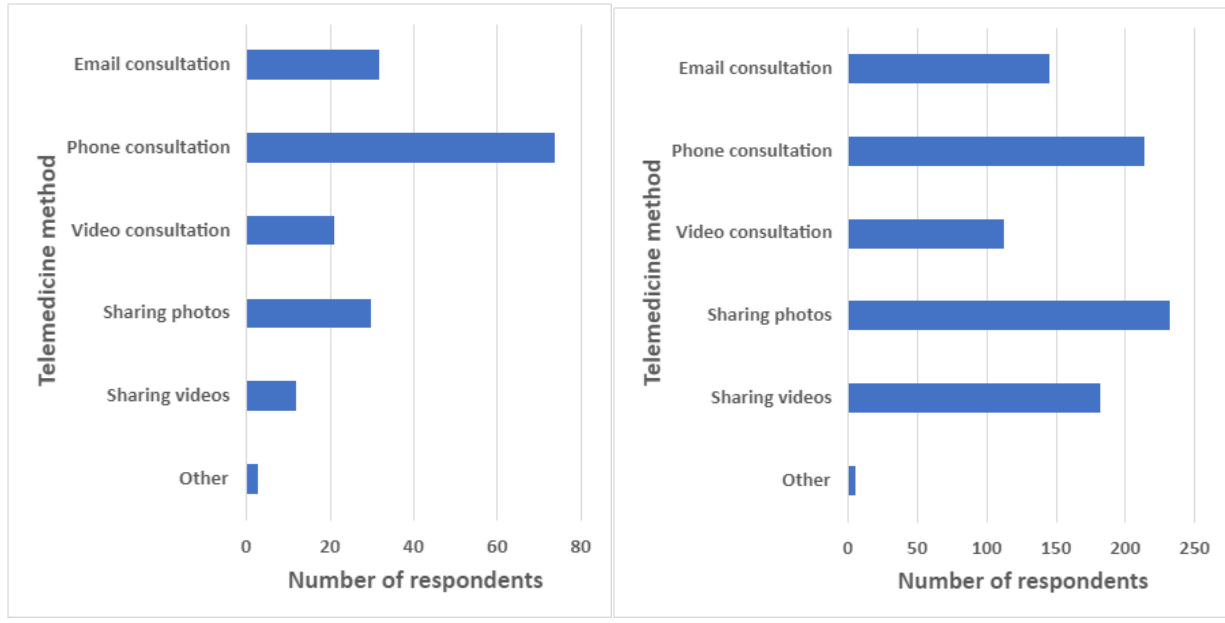
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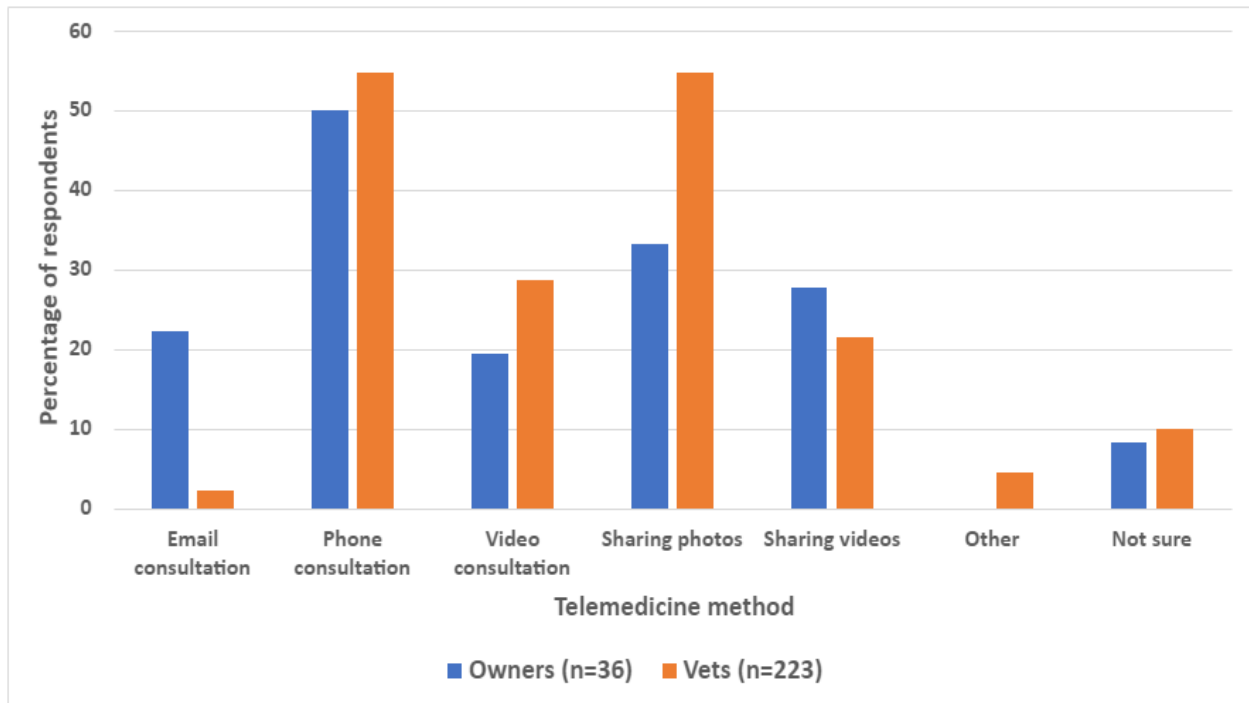
A)

B)

406 Figure 1. Number of respondents with experience of each telemedicine method from A) the owner
407 survey (n=98 respondents) and B) the vet/VN survey (n=242 respondents). Respondents were able to
408 select all telemedicine methods that they had experience with.

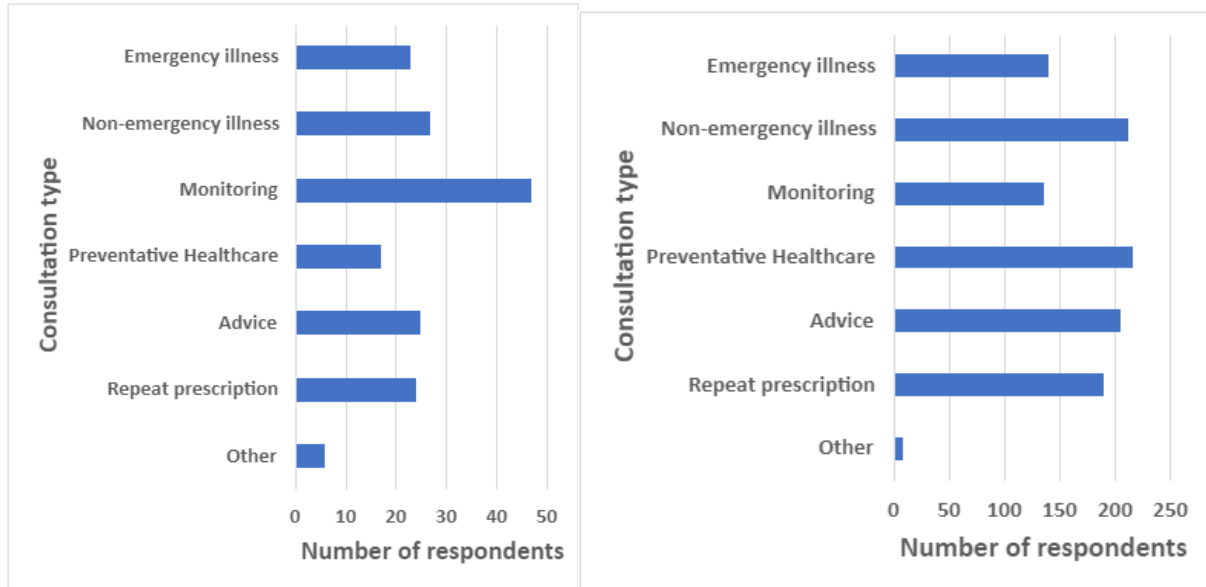
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 412 Figure 2. Preferred telemedicine method for respondents to the owner survey (n=36) and vet/VN survey
 413 (n=223) with experience of more than one type of telemedicine. Percentages total more than 100 as
 414 respondents were able to select a combination of two methods (e.g. sharing photos alongside a phone
 415 consultation) if that is what they had experienced/preferred.

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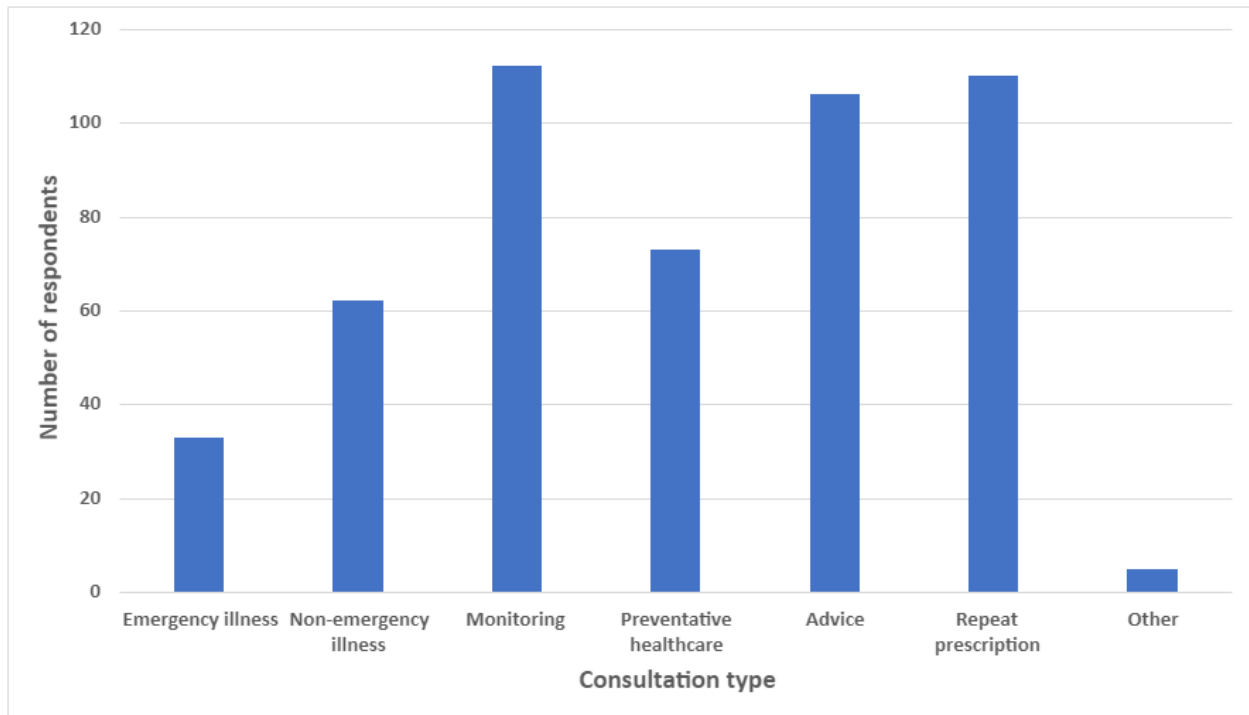
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A)

B)

419 Figure 3. Number of respondents with experience of telemedicine for each consultation type from A) the
 420 owner survey (n=98 respondents) and B) the vet/VN survey (n=242 respondents). Respondents were
 421 able to select all consultation types that they had experience of telemedicine with.

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424 Figure 4. Number of respondents to the vet/VN survey selecting each consultation type as best suited to
425 telemedicine (out of 164 respondents with experience of more than one type of telemedicine). Numbers
426 total more than 164 as respondents could select all consultation types they felt were best suited to
427 telemedicine.

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