

Neutering of cats and dogs in Ireland; pet owner self-reported perceptions of enabling and disabling factors in the decision to neuter

Martin J Downes, Catherine Devitt, Marie T Downes, Simon J More

Background: Failure among pet owners to neuter their pets results in increased straying and overpopulation problems. Variations in neutering levels can be explained by cultural differences, differences in economic status in rural and urban locations, and owner perceptions about their pet. There are also differences between male and female pet owners. There is no research pertaining to Irish pet owner attitudes towards neutering their pets. This paper identified the perceptions of a sample of Irish cat and dog owners that influenced their decisions on pet neutering. **Methods:** This study was conducted using social science (qualitative) methods, including an interview-administered survey questionnaire and focus group discussions. Data was coded and managed using Nvivo 8 qualitative data analysis software. **Results:** Focus groups were conducted with 43 pet (cats and dogs) owners. Two major categories relating to the decision to neuter were identified: (1) enabling perceptions in the decision to neuter (subcategories were: controlling unwanted pet behaviour; positive perceptions regarding pet health and welfare outcomes; perceived owner responsibility; pet function; and the influence of veterinary advice), and (2) disabling perceptions in the decision to neuter (subcategories were: perceived financial cost of neutering; perceived adequacy of existing controls; and negative perceptions regarding pet health and welfare outcomes). **Discussion:** Pet owner sense of responsibility and control are two central issues to the decision to neuter their pets. Understanding how pet owners feel about topics such as pet neutering, can help improve initiatives aimed at emphasising the responsibility of population control of cats and dogs.

1 **Neutering of cats and dogs in Ireland; pet owner self-reported perceptions of enabling and**
2 **disabling factors in the decision to neuter.**

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16 **Abstract**

17 **Background:** Failure among pet owners to neuter their pets results in increased straying and
18 overpopulation problems. Variations in neutering levels can be explained by cultural differences,
19 differences in economic status in rural and urban locations, and owner perceptions about their pet.
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22 sample of Irish cat and dog owners that influenced their decisions on pet neutering.

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30 veterinary advice), and (2) disabling perceptions in the decision to neuter (subcategories were:
31 perceived financial cost of neutering; perceived adequacy of existing controls; and negative
32 perceptions regarding pet health and welfare outcomes).

33 **Discussion:** Pet owner sense of responsibility and control are two central issues to the decision to
34 neuter their pets. Understanding how pet owners feel about topics such as pet neutering, can help
35 improve initiatives aimed at emphasising the responsibility of population control of cats and dogs.

36

37 Introduction

38 Companion animal overpopulation causes significant costs to humans and governments every year
39 (Olson et al., Apr 1; Olson & Johnston, 1993). Evidence suggests there is a connection between
40 the neutering status of pets and levels of pet straying, with low levels of neutering related to higher
41 levels of straying in pet behaviour (Hsu, Severinghaus & Serpell, 2003; Diesel, Brodbelt &
42 Laurence, 2010). The problem of overpopulation may be attributed to numerous factors that are
43 intertwined including; a failure among pet owners to neuter their pets (Hsu, Severinghaus &
44 Serpell, 2003; Natoli et al., 2006; Soto et al., 2006; Weng et al., 2006), failure to implement early
45 neutering of cats and dogs (Ortega-Pacheco et al., 2007; Farnworth et al., 2013) and poor
46 management of stray populations (Marston & Bennett, 2009; Stavisky et al., 2012) . Therefore
47 there is a responsibility for pet owners to prevent pet pregnancies and to neuter their pets, with
48 welfare organisations encourage pet owners to be responsible in neutering their pets to help reduce
49 the stray/feral dog and cat populations (Dogs Trust, 2009; Dublin Society for Prevention of Cruelty
50 to Animals, 2010).

51 There are marked differences in neutering rates across the globe. These differences can be
52 explained by variations in cultural differences and attitudes towards neutering, and differences in
53 economic status in rural and urban locations (Berthoud et al., 2011; Torres de la Riva et al., 2013).
54 Differences in the rate of neutering have been reported between the United States and Europe
55 (Trevejo, Yang & Lund, 2011; Torres de la Riva et al., 2013). One US study reported the
56 prevalence of castration at 82% in cats and 64% in dogs (Trevejo, Yang & Lund, 2011). In the
57 United Kingdom, one study reported that among 431 dog owners, 54% of dogs were neutered, and
58 there were regional differences between north and south (Diesel, Brodbelt & Laurence, 2010).
59 Reported levels are similar in Hungary (Kubinyi, Turcsán & Miklósi, 2009), but much lower in
60 Sweden (Sallander et al., 2001) and Ireland (Downes, Canty & More, 2009).

61 Perceptions owners have about their pet are also important. Owners are more likely to neuter
62 their pet if they consider it a companion rather than a working animal (Franti et al., 1980; Faver,
63 2009). Increased awareness about the benefits and harms of sterilization of female cats and dogs
64 was shown to impact positively on the decision to neuter (Faver, 2009). Perrin (2009) reported
65 that owners of ‘mostly indoor pets’ believed that neutering was not necessary. Numerous

66 reasons for not neutering have been identified using quantitative processes; including believing
67 neutering to be unnecessary, and wanting to use the pet for breeding (Fielding et al., 2002). Other
68 studies showed that participants agreed that cats and dogs have the right to remain whole and
69 have offspring (McKay et al., 2009). Owners thought that desexing changed the personality of
70 their dog (Blackshaw & Day, 1994) and were concerned about the effect of neutering on the
71 sexuality/masculinity of their pet (McKay et al., 2009). The cost of neutering also presents a
72 barrier (Blackshaw & Day, 1994; Faver, 2009).

73 There are differences in neutering levels between cats and dogs, with cat owners more likely to
74 neuter than dog owners (Franti et al., 1980; Leslie et al., 1994; Poss & Bader, 2007; Downes, Canty
75 & More, 2009; Faver, 2009; McKay, Farnworth & Waran, 2009). Referring to neutering among
76 pet dogs, concerns are expressed about neutering aged dogs and the possible impact on increasing
77 the dog's weight (Blackshaw & Day, 1994). There are also differences in belief and attitudes
78 between male and female owners (Blackshaw & Day, 1994). Male owners equate neutering with
79 removing the maleness of the dog, and were of the opinion that neutering can change the
80 personality of the pet (male and female). Some 61% of male owners and 47% of female owners
81 would not proceed with neutering their dog if they had the choice again (Blackshaw & Day, 1994).
82 There are implications for the veterinary profession in the pet care recommendations it offers
83 clients around neutering (Scarlett, Sep 15). Veterinarians can play an important role in addressing
84 problems related to neutering and overpopulation, and counselling pet owners to take appropriate
85 action (Voith, 2009). However, there are challenges to achieving the full potential of this role. For
86 example, Diesel, Brodbelt & Laurence (2010) reported that there is often variation in the
87 veterinarian advice offered to clients. For example, there was little agreement between veterinary
88 practices on the appropriate stage to neuter bitches, with 16.9% of practices recommending that a
89 bitch should have a first heat before neutering, in comparison to 20.6% not recommending
90 neutering at all (Diesel, Brodbelt & Laurence, 2010).

91 **Pet ownership and neutering in Ireland**

92 There is no research pertaining to the opinions and perspectives of Irish pet owners towards pet
93 neutering. This reflects the wider lack of research on pet ownership and pet care. Downes et al.
94 (Downes, Canty & More, 2009) reported that some 35% of households in Ireland have one or more

95 pet dogs, and 10.4% of households have one or more pet cats. Of these, 47.3% of pet dogs and
96 76.1% of pet cats were neutered. Females (in both cats and dogs) were more likely to be neutered
97 than males (Downes, Canty & More, 2009). Low levels of pet neutering in Ireland, along with the
98 uncounted number of strays reproducing, means that it is difficult to control overpopulation of cats
99 and dogs in Ireland.

100 **Study objectives**

101 Given the lack of information on pet owner perspectives on neutering in Ireland, the aim of this
102 study is to identify the self-reported perceptions of a sample of Irish cat and dog owners that
103 influenced their decisions on pet neutering.

104 **Material and methods**

105 This study was conducted using social science (qualitative) methods and reported using the
106 EQUATOR network reporting guidelines: Consolidated criteria for reporting qualitative research
107 (COREQ) (Tong, Sainsbury & Craig, 2007). Qualitative methodology can provide rich and
108 detailed information from which to develop models and theories in an area where very little
109 research has taken place (Barbour, 2005), with emphasis placed on inductive inquiry and a
110 subjective view of the insider (Green and Thorogood, 2004). Previous studies examining issues
111 surrounding neutering in pets have mainly used quantitative methods such as questionnaires
112 utilizing predetermined answers as methods of collecting data. However, this approach has some
113 limitations (for example; these methods limit the results to the ideas of the researcher), as
114 acknowledged by some researchers (Robertson, 2003). Also while statistical methods can provide
115 some insight into the associations between neutering and attitudes, they can rarely account for all
116 observed variation, leaving a gap in the evidence to be explored. Focus groups are a common
117 qualitative method. This approach is frequently used to facilitate the expression of ideas and
118 experiences that would be left unexplored in a questionnaire or interview and clarifies participants'
119 perspectives through debate within the group (Kitzinger, 1995).

120 **Study design**

121 Research ethical approval was granted by the University College Dublin (UCD) Human Research
122 Ethics Committee. Participants were required to sign a written form of consent. For the
123 methodology, qualitative research methods - focus groups - were used. Focus groups allowed
124 participants to openly discuss their feelings on neutering, and to indicate their own decisions
125 around neutering their pets.

126 **Participant recruitment**

127 Pet owners were recruited through six different private veterinary practices (three city practices;
128 two in regional towns; and one in a rural area). The practices selected were a convenience sample
129 to ensure compliance and each of these practices agreed to participation in the study. Participants
130 were recruited by the practices, where fliers and posters were put in place and the staff was asked
131 to highlight the research project, to encourage participants to volunteer. Participants were offered
132 a voucher to the value of €50 for the practice where they were recruited from. Seven focus groups
133 were conducted with 43 participants in total; three to nine participants in each group.

134 **Data collection and analysis**

135 A survey was administered prior to the commencement of the focus groups, to collect information
136 on pet owner profile (age, location, type of dwelling, and household composition) and pet profile
137 information (type and number of pets in participating households). Table 1 presents the participant
138 socio-demographic profile.

139 An interview topic guide was used to direct all of the focus groups. Questions guided the focus
140 groups to explore reasons for pet ownership and pet choice; views and decisions on pet neutering;
141 feeding and weight control; and pet exercise:

- 142 • Why do you have a pet?
- 143 • Why did you choose that type of pet?
- 144 • What are your views on neutering dogs and cats?
- 145 • What influenced your decision to have your pet neutered or not?
- 146 • What are your views on pet diets, both homemade and commercial?
- 147 • What factors influence the weight of your pet?

- 148 • How do you feel about exercising your pet?

149 All focus groups were audio-recorded and transcribed. The coding and the analysis process were
150 assisted using Nvivo 8 (© QSR International Pty Ltd 2007) qualitative data analysis software.

151 Focus group data were grouped together using codes and themes in accordance with the technique
152 described by Attride-Stirling (2001). Minor thematic codes were developed inductively as the
153 transcripts were reviewed, allowing the data collected to dictate the categories for analysis. After
154 coding, the first two authors mutually agreed on the categories that were to be used in the analysis.
155 Two major categories related to the decision to neuter were identified: (1) Enabling perceptions in
156 the decision to neuter (five subcategories); and (2) Disabling perceptions in the decision to neuter
157 (three subcategories). The subcategories are as follows:

- 158 1. Enabling perceptions in the decision to neuter
159 a. Controlling unwanted pet behaviour
160 b. Positive perceptions regarding pet health and welfare outcomes
161 c. Perceived owner responsibility
162 d. Pet function
163 e. The influence of veterinary advice
164 2. Disabling perceptions in the decision to neuter
165 a. Perceived financial cost of neutering
166 b. Perceived adequacy of existing controls
167 c. Negative perceptions regarding pet health and welfare outcomes

168 **Results**

169 **Profile of neutering status**

170 Forty three participants took part in the study. Of these, 81.4% (35) neutered at least one of their
171 pets. For one of the focus groups, three participants did not turn up leaving only three participants
172 available for the focus group; however this did not impact on the quality of the data collected from
173 this focus group. Though sample sizes are small; more owners had neutered cats than dogs, relative
174 to the sample size. Eight pet owners neutered some of their pets, and the same number did not

175 neuter their pets. Table 2 details the profile of neutering among pet owners in the study.

176 **Enabling perceptions in the decision to neuter**

177 **Controlling unwanted pet behaviour**

178 For pet owners, that neutered their pets, neutering provided a means of controlling pet behaviour
179 and reducing the propensity for unwanted and undesired behaviours for the pet owner. Animal
180 behaviours that were identified as unfavourable included fighting between pets, and straying.
181 Neutering reduces the attraction of other cats and dogs to the pet owners' home, and prevents
182 unwanted pets.

183 *'It's a case of health issues and trying to keep the cats out of fights.... I think if they're not*
184 *neutered, they want to be out more. Especially at night and that's putting them at risk from*
185 *the traffic'*

186 *'My dog is neutered... he's a cocker spaniel and they have a reputation for being hyper.*
187 *Neutering will calm him down. I don't know what happens when dogs go into heat but I do*
188 *know that the males go mad so I just thought it would be safer, as we walk him [with]out*
189 *the lead. I'd be petrified if he ran off. I wouldn't know what to do, so I would agree with*
190 *neutering'.*

191 *'I think with cats, you want them there, and a neutered cat stays around the house, they*
192 *don't wander'.*

193 *'One tabby was neutered when I got it and I decided to neuter the others because they*
194 *would mark their territory and probably fight more. So they are all neutered.'*

195 **Positive perceptions regarding pet health and welfare outcomes**

196 Much discussion was had on the health consequences of neutering for pets. Pet owners referred to
197 the beliefs of others, and their own:

198 *'People said he'd [pet dog] be sluggish, he'd be lethargic, and he'll put on weight. I never*

199 *saw any change. He was a young happy dog. There are these myths going around that*
200 *[neutering]will change your dog's character. I've never seen that'.*

201 Pet owners, in favour of neutering, regard neutering as an effective way of ensuring good animal
202 health for their pets. In addition to controlling the pet's behaviour and reducing the propensity for
203 unwanted pet behaviours, neutering pets was seen as a way of reducing the risk of the spread of
204 disease, infections, and harm caused by fighting (and mating) between animals. For these reasons,
205 neutering was seen as a way of prolonging the life span of the pet.

206 *'With the cats, it's a case of health issues, to avoid the risk of Feline AIDS. They can pick*
207 *up so much if they're out and fighting'.*

208 *'A male cat, I had him neutered because I didn't want him to catch feline AIDS'*

209 *'It will prevent them [cat] having infection or uterine cancer... or mammary cancer'.*

210 Both cat and dog owners refer to neutering as increasing the life span of the pet.

211 *'If you have the dog neutered, the bitch neutered, it can extend her life because they don't*
212 *have to go through the ordeal of giving birth, pups. That can actually add another year or*
213 *two to the bitch's life span, so that's why I got my present dog neutered'.*

214 *'Neutering prolongs the males' [cat] life. They're not fighting and spreading disease'.*

215 *'They are pets, it can increase their lifespan because of cancer and diseases, I wanted*
216 *them [dogs] to live a couple of years longer, it may be selfish, they may have had some*
217 *great experiences, but I'll hang onto them as long as possible'.*

218 **Perceived owner responsibility**

219 Owner sense of responsibility was apparent in the statements of pet owners who are in favour of
220 neutering. Owners felt a responsibility to reduce unwanted pregnancies, and prevent over-
221 population of unwanted cats and dogs.

222 *'A dog yes, you don't want to be responsible for your pet creating a litter of pups or kittens'.*

223 *‘Every time you hear figures, how many pets - dogs and cats - that have to be put down*
224 *every year, because they can't be kept, the shelters are all overrun with them. It's just the*
225 *thought of it going on, is just horrible’.*

226 *‘I don't want the responsibility of having kittens or having to find homes. So it is the*
227 *responsible thing to do’.*

228 *‘Neutering is more responsible and there are too many puppies around. I have cats and I*
229 *let them outside. I would hate to have it on my conscience that they were the cause of some*
230 *other cat having a litter’.*

231 Pet owner comments reflect an emotional perspective on the problem of overpopulation, and not
232 wanting to deal with the implications of finding homes for unwanted kittens and pups, or the
233 implications at an emotional level for the owner.

234 **Pet function**

235 Keeping a pet (dogs were specifically mentioned in this study) for breeding purposes was
236 identified as a reason for deciding not to neuter.

237 *‘[Dogs] should be neutered unless there is a good reason for breeding from them’.*

238 *‘I had my cat neutered and I can see no point not to, unless you particularly want to breed*
239 *from the animal for some reason’.*

240 Only one pet owner indicated that they were breeding from their pet dog, and therefore, decided
241 against neutering. There was no reference made to other functional related reasons for owning a
242 pet, e.g., working animal, companionship, etc. .

243 **The influence of veterinary advice**

244 Only four pet owners referred specifically to the role of veterinary advice in informing their
245 decision to neuter. There was general consensus among the groups that neutering would be
246 complied with if medically required. Two of these pet owners noted they were not in favour of

247 neutering, but complied with medical advice. There were mixed opinions on this decision, with
248 reference being made to a loss of perceived control over the decision:

249 *‘So the advice was that medically I should do it [neuter the pet dog], so I did it and I didn't*
250 *really think about the rights and wrongs of it at all really’.*

251 *‘The vet would make the decision for us; she did say the female was quite small to have*
252 *pups’.*

253 *‘My decision ended up having to be taken from me... the real decision was that she then*
254 *got a false pregnancy and the vet said to me this can be a precursor of cancer type of thing*
255 *and really I'd be better off doing it’.*

256 The influence of media featured very little in the focus groups, but pet owners made reference to
257 information on the number of injured, unhealthy and euthanized cats and dogs.

258 **Disabling perceptions in the decision to neuter**

259 **Perceived financial cost of neutering**

260 Financial cost was identified as a barrier to improving the prevalence of neutering of pet cats and
261 dogs. This barrier was identified by five participants; though all five had their pet neutered. Instead,
262 concern was raised that the financial costs of neutering would prevent others from neutering their
263 pets.

264 *‘I think the cost in Ireland is extremely high.... I had my two dogs done at the same time*
265 *eight years ago and it was about £350 to get them neutered by the vet’.*

266 *‘For the two [cats]... that was my bill when I went to pick them up. That’s an awful lot of*
267 *money... there are people who genuinely can’t afford it...’*

268

269 **Perceived adequacy of existing controls**

270 There was an overwhelming perception among those who did not have their pets neutered that
271 adequate control measures were in place, or that neutering was not necessary because the pet was
272 always indoors, or within sight of the owner. These measures include keeping the pet inside a
273 controlled environment, such as the owners' house.

274 *'The dog we have at the moment is not neutered. It depends on the dog and the environment*
275 *which it lives, whether you have a garden, whether other people are home during the day,*
276 *whether the dog is taken out on the lead only'.*

277 *'When we got the dog, she was not neutered simply because she was always under control*
278 *and there was no one living near us. So all of us made sure she was tied, up in her pen'.*

279 *'No, he's [pet dog] not neutered. He's around us all the time. He's under strict control*
280 *around the house'.*

281 *'One pet which is completely indoors - She's a total house dog. Someone's always with*
282 *her if she's outside, there's no need for her to be neutered'.*

283 *'[Neutered dogs] get too fat and lazy and it's not hard to lock up a bitch for a month twice*
284 *a year. I have dogs and bitches at home and I can cope with it... if you've a bitch in heat,*
285 *you lock her up. I don't agree [with] neutering'.*

286 Specific reference was made to dogs; dogs were perceived as easier to control than cats.

287 *'I didn't neuter the dog but he was never loose outside. There was never any chance he*
288 *was going to get himself into trouble, because he was either inside with us or outside with*
289 *one of us, but I did neuter both of the cats. I did that because I didn't want the male to get*
290 *himself in to trouble in other peoples gardens'.*

291 *'I can understand with cats [the need to neuter] because they're out wandering and stuff,*
292 *but with a dog and you know where they are all the time.'*

293 In this instance, the cats and a male dog are neutered. However, the decision was made not to
294 neuter the female dog:

295 *'All my cats are neutered and only one male is neutered... cats get diseases when they're*
296 *out and around whereas the dogs are more home birds'.*

297 **Negative perceptions regarding pet health and welfare outcomes**

298 As with the decision to neuter, concerns pertaining to animal health were also influential in the
299 decision not to neuter. These concerns reflect pet owners' beliefs regarding the consequences
300 and outcomes of neutering.

301 *'When you get them [cats] neutered, they are inclined to put on a lot of weight, and they*
302 *lose their shape'.*

303 *'It is nice to leave them [pets] and not play around with them too much... just leave them*
304 *as their natural self'.*

305 Statements point to the belief that neutering is unnatural for the pet. Among some owners of
306 neutered bitches, concern was expressed about the invasiveness of the procedure, how sick it had
307 made their pet, and contributed to weight gain. Given this experience, these owners expressed
308 reluctance to neuter future pets.

309 **Discussion**

310 **Overview**

311 In this study, the majority of the participant group had neutered all of their pets (62.8%).

312 Self-reported perceptions were organised into those that were i) enabling (i.e. supported the
313 decision to neuter) and ii) disabling (i.e. were against the decision to neuter). All pet owners in
314 favour of neutering had neutered their pets. A minority of those against neutering also had their
315 pets neutered, in compliance with medical advice. Enabling perceptions that supported the decision
316 to neuter included: a desire to control unwanted behaviours (such as straying and fighting);
317 concerns over animal health; a perceived sense of owner responsibility; pet function; and because
318 of veterinary advice. Disabling perceptions that influenced the decision not to neuter included: the
319 perceived financial cost of neutering; the adequacy of existing controls; and concerns over animal

320 health. It is hoped that, in addition to encouraging further research for an Irish context, the results
321 in this paper will contribute to a better understanding of pet owner behaviour, and contribute to
322 informing veterinary advice and support for adequate pet care.

323 **Discussion of key findings**

324 The health benefits of neutering for pets included decreased risk of cancer, and increased longevity
325 (Michell, 1998). In this study, there was a clear connection between the desire to control pet
326 behaviours (such as straying and fighting), perceived perceptions regarding pet health and welfare
327 outcomes, and the objective of preventing inconvenient implications for the pet owner (such as
328 dealing with unwanted kittens). Neutering was described as prolonging the life span of the pet.
329 This may suggest that owners' decisions are influenced by information beyond their own
330 experiences, such as from a veterinarian (Faver, 2009); however, explicit reference to veterinary
331 advice was made by only a small number of pet owners. For those in favour, neutering was
332 generally considered a matter of responsibility, with reference being made to the need for cat and
333 dog population control. This suggests a level of awareness among these pet owners not only of the
334 health related benefits of neutering, but also the wider problems associated with overpopulation.

335 The importance of normative beliefs and perceived ability are important in explaining the
336 relationship between responsibility and behaviour among pet owners (Rohlf et al., 2010). Recent
337 welfare organizations marketing strategies emphasise the responsibility of population control on
338 pet owners (Dogs Trust, 2009; Dublin Society for Prevention of Cruelty to Animals, 2010). The
339 results show that responsibility and control are two central issues. Pet owners in favour of neutering
340 commented on their sense of responsibility – reflecting an emotional component and an awareness
341 of the implications for the wider cat and dog population if they did not neuter their pets. These pet
342 owners also talked about not wanting to have to respond to unwanted offspring. This reflects their
343 sense of control and responsibility over their pet's behaviour. Neutering provides a means of
344 controlling this behaviour and emotionally reassuring the pet owner. Those against neutering
345 emphasised the adequacy of existing control measures – suggesting a high level of perceived
346 control over the behaviour of their pet, the pet's environment, and the owner's own ability to keep
347 the pet under observation. This is similar to the findings of Perrin (2009) who reported that owners
348 of 'indoor' pets believed that neutering was not necessary. Owner responsibility was not

349 mentioned by those not in favour of neutering – though pet-related health concerns were
350 emphasised – with pet owners expressing concerns about the invasiveness of the operation, and
351 the risk of pet obesity. Differences were recorded in opinions towards neutering of cats and dogs.
352 Cats were regarded as wanderers, less easy to control and more prone to picking up infection and
353 disease. Dogs were seen as easier to control, and therefore, control measures (such as keeping the
354 dog in a controlled environment, such as indoors) were regarded by some as adequate.

355 Though financial concerns did not feature strongly in the results, the research literature does show
356 that the cost of neutering can present a barrier to pet owners (Blackshaw & Day, 1994; Faver,
357 2009). At the time of research, the economic climate in Ireland has resulted in less disposable
358 income for people. Pet owners may regard neutering as less of a priority, and instead, implement
359 measures to keep the pet indoors. Recent media coverage has highlighted a growing problem of
360 dog and cat abandonment, associated with a weak economic climate (for example, an article in
361 The Irish Times ‘*Overcrowded animal centre in urgent appeal for 'responsible' owners after rise*
362 *in abandoned pet*’ (The Irish Times, 2012) and an article in the Irish Examiner ‘*Abandonment on*
363 *rise during recession*’ (Irish Examiner, 2012).

364 As there are varying attitudes to neutering in different settings, it is important to conduct research
365 around this area in different countries. Even the level of neutering varies across different countries,
366 for example; only 3% of dogs in the Coquimbo region of Chile (Acosta-Jamett et al., 2010) and
367 1.1% of dogs in Sweden (Sallander et al., 2001) were neutered compared to 47.3% of pet dogs in
368 Ireland (Downes, Canty & More, 2009). There are even within country variations, depending on
369 the methodology used to collect the data i.e: in the US, 64% of dogs are neutered according to
370 Trevejo, Yang & Lund (2011) compared to 83% as estimated by the American Society for the
371 Prevention of Cruelty to Animals (ASPCA, 2011). As far as the authors are aware, the current
372 study is the first study to use qualitative methods to provide rich data on the attitudes and
373 behaviours of pet owners towards neutering and is the first to identify factors associated with
374 neutering in Ireland. With this in mind the data will benefit current practice and to aid in the
375 development of future research in Ireland.

376 **Implications for veterinary advice on neutering**

377 Understanding how pet owners feel about topics such as neutering gives veterinary services the
378 knowledge and understanding to improve their relationship and communication with pet owners
379 (Perrin, 2009). It has been suggested that veterinary practitioners need to communicate more
380 effectively with pet owners around the time of neutering, to ease the burden of neutering on the
381 pet and the owner and to encourage owners to neuter future pets (Blackshaw & Day, 1994). Diesel,
382 Brodbelt & Laurence (2010) however, found variations between veterinarian recommendations to
383 pet owners on neutering. This may suggest a lack of consistency in approach and gaps in
384 information on best practice, within the veterinary profession. Though, in this study, the
385 veterinarian did not feature strongly in perceptions of neutering, there is value in considering the
386 role that veterinarians play in working with pet owners. Often the decision to neuter was made by
387 the veterinarian, and some pet owners spoke of the decision being made for them. Effective
388 communication is central. Coe, Adams & Bonnett, (2008) emphasises the importance of educating
389 clients, providing choices, and using two-way communication. These are important factors that
390 need to be considered by veterinarians when advising on neutering.

391 Various initiatives have been launched in Ireland. The Irish Society for the Prevention of Cruelty
392 to Animals (ISPICA) issued an information leaflet '*It pays to spay or neuter your pet*' (Irish Society
393 for Prevention of Cruelty to Animals) which presents information on neutering, and clarification
394 around neutering myths. Another example - the Dogs Trust launched the "it's nicer to neuter"
395 campaign (Dogs Trust, 2009), in an effort to reduce the number of unwanted dogs that are
396 euthanized annually. However, behavioural change cannot be attributed to information alone;
397 attitudinal changes are also required (Ajzen, 1991). The promotion of owner responsibility within
398 the wider community (outside of the confines of the owners home) is one area that can be targeted
399 by neutering initiatives. In addition, the results clearly suggest that pet health is important for pet
400 owners (those for and against neutering). Given the centrality of health concerns for pet owners,
401 attempts to promote neutering should take into account the role of veterinary support and advice
402 in adequately informing pet owners on the health benefits of neutering (Faver, 2009).

403 **Limitations in the study design and recommendations for future research**

404 In this sample there was an over representation of female owners. There is evidence in the research
405 that shows differences in belief and attitudes between male and female pet owners, with male

406 owners expressing concern over a change to the pet's personality as a result of neutering
407 (Blackshaw & Day, 1994). It may be argued that future research pertaining to an Irish population
408 should seek to differentiate differences in belief and levels of neutering between male and female
409 owners. The sample was not stratified by socio-economic group, though different geographical
410 locations, urban and rural, were chosen to minimise this bias. The recruitment of pet owners took
411 place through private veterinary practices. Therefore, it is probable to suggest that participants
412 were more engaged in their pet's health, and could afford to avail of veterinary health care services.

413 While the sample size is not powered to conduct statistical hypothesis testing, as it is not
414 appropriate in a qualitative setting, rather information was collected until saturation of the data
415 was reached. In qualitative research; sampling is conducted to select the most appropriate
416 participants, in this case pet owners (Daly et al., 2007), therefore it may not be necessary to conduct
417 random sampling techniques. In addition, focus groups provide a platform to develop an
418 understanding of participants' behaviour and attitudes based on their knowledge of the situation
419 being addressed and provide a more pleasing setting for discussion to occur leading to richer and
420 more realistic data (Heary & Hennessy, 2002; Green & Thorogood, 2004). Thematic analysis
421 allows an interpretation of the data based on experience, and educational and social interactions
422 leading to a better understanding of the issue being addressed (Green & Thorogood, 2004). Also,
423 to reduce bias, this study was conducted and the data is presented and interpreted in a way that
424 meets the critical appraisal guidelines as outlined by the Cochrane Collaboration Qualitative
425 Methods Group to ensure the high quality of the study (Harris, 2011).

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Table 1 (on next page)

Socio-demographic profile for participating pet owners

Table 1: Socio-demographic profile for participating pet owners (N = 43)

1 **Table 1: Socio-demographic profile for participating pet owners (N = 43)**

Socio-demographic variable		Frequency (%)	Ireland pet owners ^a %
Age	18–24	3 (7.0)	14.3
	25–34	7 (16.3)	24.6
	35–44	5 (11.6)	21.6
	45–54	8 (18.6)	17.1
	55–64	14 (32.6)	14.15
	65+	6 (14.0)	8.25
	Total	43 (100.0)	100
Gender	Female	30 (69.8)	50.7
	Male	13 (30.2)	49.3
	Total	43 (100.00)	100
House Type	Apartment	1 (2.3)	1.4
	Detached	18 (41.9)	57.2
	Semi detached	13 (30.2)	28.6
	Terraced house	9 (20.9)	10.0
	Missing	2 (4.6)	2.8
	Total	43 (100.00)	100
Household Composition	Lone parent with children	3 (7.0)	8.1
	Married or Cohabiting couple	11 (25.6)	19.84
	Married or Cohabiting couple with children	13 (30.2)	59.3
	Mixed non-family household	8 (18.6)	4.13
	One person	8 (18.6)	8.6
	Total	43 (100.0)	100
Marital Status	Cohabiting	3 (7.0)	11.4
	Divorced or Separated	2 (4.7)	8.4
	Married	18 (41.9)	57.3
	Single	20 (46.5)	21.7
	Total	43 (100.0)	98.8 ^b
Urban/Rural Location	Rural	15 (34.9)	38.1
	Urban	28 (65.1)	61.9
	Total	43 (100.0)	100

2 **Bold** = most frequent category3 ^a data taken from Downes et al. 20094 ^b 1.2% didn't answer.

5

Table 2 (on next page)

Profile of neutering (for cat, dogs, and both) among pet owners

Table 2: Profile of neutering (for cat, dogs, and both) among pet owners (N = 43)

1 **Table 2: Profile of neutering (for cat, dogs, and both) among pet owners (N = 43)**

Neuter status	Cat	Dog	Both cat and dog	Total
	n (%)	n (%)	n (%)	N (%)
Yes	8 (29.6)	9 (33.3)	10 (37)	27 (62.8)
Some	1 (12.5)	2 (25)	5 (18.5)	8 (18.6)
No	-	5 (62.5)	3 (37.5)	8 (18.6)
Total	9 (20.9)	16 (37.2)	18 (41.9)	43

2

3