

KNOWLEDGE AND ATTITUDES OF MALAYSIAN AND UK VETERINARIANS ON PAIN AND ANALGESIA IN CATS

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SUMMARY

Knowing that animals can feel pain does not necessarily mean that veterinarians will be able to manage pain. This study aimed to assess Malaysian and British veterinarians for their knowledge and attitude towards pain in cats. An online questionnaire (SurveyMonkey[®]) was developed to assess knowledge of- and attitudes towards cat pain and distributed to all registered veterinary surgeons in Malaysia and the UK. A total of 171 UK veterinarians and 265 Malaysian veterinarians completed the questionnaire. In general, demographics were similar between countries. The majority of respondents were female in Malaysia and UK. There were more recent graduates in the Malaysian sample and Malaysians were also more likely to be working in an urban environment than veterinarians working in the UK. Although both countries showed positive attitudes and knowledge of cat pain, pain assessment, and the use of analgesia in cats, however several differences were observed. The most important differences included (i) Malaysian veterinarians thought that they had insufficient knowledge of pain, (ii) UK veterinarians emphasized both behaviour and physiology in assessing cat pain where Malaysian veterinarians focused on physiological indicators, (iii) Malaysian veterinarians were more concerned about cost, record keeping and side effects from using Opioids and NSAIDs than veterinarian in the UK. Education on behaviour of cats suffering from pain and pain management in cats (e.g. pain assessment and pain relief) are important subject areas to be emphasized in the Malaysian veterinary curricula.

Keywords: attitudes, cat pain, knowledge, Malaysia, veterinarians

INTRODUCTION

Pain in humans can be defined as a multidimensional experience; it is not only what you perceive but also how it makes you feel emotionally (Reid *et al.*, 2013) and the same has been shown to be true in non-human mammals (i.e. pain in animals is “*an aversive sensory experience that elicits protective motor actions, results in learned avoidance and may modify species specific traits of behaviour, including social behaviour*” (Molony and Kent, 1997). The multidimensional nature of pain can cause emotional, psychological and physical experiences which can be observed through the behavioural changes of the animals experiencing painful stimuli. This significantly impacts an animal's welfare (Rutherford, 2002).

Historically there have been difficulties in recognising pain in cats, which is thought to be due to a lack of understanding of how cats exhibit pain-related behaviours (Merola and Mills, 2016). Another reason why pain recognition is considered challenging in cats is that they are considered a ‘stoic’ species. Alongside stoicism, there have been few pain scales that have been validated for cats (Stegall and Monteiro, 2019). Even this scale have been validated, but the use of scale might have some

limitations, for example, certain demeanours (e.g. shy or fearful cat) may present high pain scores and it can be difficult to distinguish whether they are truly painful or whether their behaviour affects pain assessment (Stegall and Monteiro, 2019), and there may also be cultural or regional contexts (Phillips *et al.*, 2012; Reed and Upjohn, 2018) which affect the management of pain in cats such as there have been observed differences between the way analgesia for painful conditions in cats has been administered in Australia, New Zealand and the UK (Farnworth *et al.*, 2014). Comparative studies like this one are often limited in recruitment, making comparisons between populations difficult; however, it is notable that differences were observed between three economically wealthy English-speaking countries (namely, Australia, New Zealand and the UK). In upper-middle-income countries, these differences could be compounded by factors such as cultural differences (Reed and Upjohn, 2018), variations in education (Sugano, 2014), the inability of non-English speakers to access English speaking resources (e.g.: pain scales) and inadequate access to e-resources for continuing professional development (Murrell *et al.*, 2008).

A ‘One World Health and Welfare’ approach must consider the context of animal welfare education within each country to improve animal welfare. This is because different countries may provide different veterinary education curricula that may, in turn, affect the way veterinary students and graduates perceive animal welfare (Sugano, 2014).

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Hitherto, most studies have been reported in English speaking countries. There is insufficient data from Malaysia. Thus, it is important to explore the Malaysian veterinarians' perspective regarding cat welfare. Currently, there is insufficient information to make a meaningful comparison between Malaysian and UK veterinarians on this subject. Malaysia aims to achieve a standard of animal welfare that is as good as that found in countries such as the UK or New Zealand. The UK provides the best comparator for measuring animal welfare in Malaysia, because the UK is often regarded as having the highest level of animal welfare (Nizam and Tahman, 2019). Therefore, in this study, we will explore the differences between attitudes and knowledge regarding pain recognition in cats between Malaysia and the UK.

This study characterized the Malaysian veterinary population's: (i) Knowledge of cat pain, (ii) Attitudes towards cat pain, (iii) Ability to recognize cat pain, (iv) Current clinical practices relating to cat pain, and (v) To relate (i) – (iv) to demographic data and to compare and contrast these findings with veterinarians in the UK, and finally (vi) to understand how veterinarians would like to receive education on topics related to cat pain.

MATERIALS AND METHODS

Ethical approval, consent and data management

The study was approved by the Human Ethics Research Committee (HERC) on 25th January 2017, Royal (Dick) School of Veterinary Studies, University of Edinburgh: HERC approved project number HERC_56_16. The project also has ethical approval from the Malaysian Medical Research and Ethics Committee (MREC): approved project number nmrr-17-672-35076. All the answers were kept anonymously and were not shared with third parties. They were kept securely and stored on a secure server which was held in relation to the UK Data Protection Act in the United Kingdom.

Participant recruitment

UK

The Royal College of Veterinary Surgeons (RCVS) list of registered surgeons was used to recruit UK participants. A link to the questionnaire was emailed to every registered email address accredited by RCVS (n = 2100) on 13th of March 2017. A reminder email was sent out two weeks after the initial email. The questionnaire also was published on the Facebook pages of both the Royal (Dick) School of Veterinary Studies and the Vet Times.

Malaysia

There were a total of 1354 registered veterinarians with Malaysian Veterinary Council (MVC). 832 veterinarians were approached via email. Paper questionnaires were sent to 450 veterinarians who did not have email addresses. The author was unable to contact the remaining veterinarians (n = 72) due to lack of contact details (e.g. no available email address or practice address).

The questionnaire also was released via social media (e.g. Facebook) by approaching a veterinarians' social media group discussion. All the methods of questionnaire distribution used different URL links to identify the mode of participant recruitment.

Questionnaire development

There were five sections in the questionnaire. The first section was 'Veterinary demographics' which focused on gender, year of graduation, school of graduation, area of practice, number of veterinarians and veterinary nurse/assistant in the clinical practice and field of practice. For the second section, 17 Likert-like scale statements relating to 'Knowledge and attitude to cat pain' were developed. In section three, there were 29 statements developed to investigate the ability of veterinarians to recognize and assess pain in cats which include how useful each pain indicator (physiological and/ or behavioural) was to assess pain in cats. 27 statements were developed in the fourth section which dealt more specifically with analgesia use in cats. Section 5 collected opinions regarding preferable educational resources for 'Continuing education' in cat pain. The questionnaire can be made available upon request.

There were two versions of questionnaire (English and Bahasa Malaysia). The Bahasa Malaysia questionnaire was written by the researcher and then back-translated by other Malaysian veterinarians in English to ensure the similarity between the two versions. Both questionnaires were created in SurveyMonkey® (San Mateo, California, USA), the software package which we used as our model for developing, distributing and collecting data from respondents.

Pilot questionnaire

All the questions were pilot tested by a small group of UK and Malaysian veterinarians. Five veterinarians in the Royal (Dick) School of Veterinary Studies and the Hospital for Small Animal at the University of Edinburgh and six Malaysian veterinarians were involved in the pilot test. Two reminders were sent out after the second and the fourth weeks after the initial pilot questionnaire opened. This applied to both forms of questionnaire distribution (e.g. via email and social media). All the comments and feedback from veterinarians were incorporated into an amended questionnaire.

Statistical analysis

Descriptive analysis was used for each question where the response rate was calculated. Participants were included in the response rate if they completed 50% or more of their questionnaire. To examine differences between countries in the Likert-like scale questions, the analysis was run separately and tested with each univariate demographic by using the non-parametric statistical test (e.g. the Kruskal Wallis and Wilcoxon ranked tests). The test is considered to be significant if the *P*-value is less than 0.05. Statistical analysis was carried out in R studio, using R version number 3.4.3 (R Core

Table 1. Demographic details of respondents for UK and Malaysia.

Demographics	% UK (n)	% Malaysia (n)
**Gender		
Men	17.0% (29)	29.5% (77)
Women	81.3% (139)	68.7% (180)
Prefer not to disclose	1.8% (3)	1.9% (3)
***Year of graduation		
Before 1960	0% (0)	0.4% (1)
1961-1970	0.6% (1)	0.4% (1)
1971-1980	2.3% (4)	1.9% (5)
1981-1990	9.9% (17)	6.1% (16)
1991-2000	13.5% (23)	9.5% (25)
2001-2010	39.2% (67)	30.5% (80)
2011-2016	34.5% (59)	51.1% (134)
School		
	UK: 85.4% (146)	UPM: 86.6% (227)
	Non-UK: 14.0% (24)	UMK: 5.0% (13)
	Other: 0.6% (1)	Other: 8.4% (22)
Area		
	Village/rural: 14.6% (25)	Rural: 4.3% (11)
	Small city/town: 40.9% (70)	Urban: 62.6% (161)
	Sub-urban city: 13.5% (23)	Mixed rural and urban: 29.6% (76)
	Urban city: 20.5% (35)	Not sure: 2.3% (6)
	Other: 10.5% (18)	Other: 1.2% (3)
**Field of practice		
Small animal	71.9% (123)	54.6% (143)
Large animal	1.8% (3)	5.0% (13)
Educators	6.4% (11)	3.8% (10)
Mixed practice	9.4% (16)	19.1% (50)
Other	4.1% (7)	13.7% (36)
Small animal & educator	6.4% (11)	3.8% (10)
***No. of veterinarians in a practice		
1-3	25.7% (44)	51.9% (136)
4-6	34.5% (59)	16.8% (44)
7-10	15.8% (27)	12.6% (33)
More than 10	24.0% (41)	18.7% (49)
***No. of veterinary nurses in a practice		
No veterinary nurse	4.7% (8)	18.1% (47)
1-3	27.5% (47)	42.9% (111)
4-6	28.7% (49)	13.1% (34)
7-10	11.7% (20)	7.3% (19)
More than 10	27.5% (47)	18.5% (48)

The table shows the percentage (number of participants) in each demographics questions by country.

Note: UPM = University Putra Malaysia, UMK = University Malaysia Kelantan, * P < 0.05, ** P < 0.01, *** P < 0.001.

Team, 2017). The following packages were used, *Likert* (Bryer *et al.*, 2016) and tidyverse (Hadley, 2017).

RESULTS

Of the 204 UK respondents, 171 (83.38%) were accordingly usable, and of the 341 Malaysian respondents, 265 (77.7%) were usable. Detailed demographic data is available in Table 1. For the UK responses, 81.3% respondents were women (n = 139). Most (39.2%, n = 67) graduated between the years 2001-2010, and 85.4% (n = 146) graduated from veterinary schools located in the United Kingdom. The majority of those who responded to this questionnaire practised in a small city or town (40.9%, n = 70). Over half of those questioned reported that they

were small animal practitioners (71.9%, n = 123) and only 1.8% (n = 3) were large animal practitioners. Most practices were reported to have between 4-6 veterinarians (34.5%, n = 59) and 4-6 veterinary nurses (28.7%, n = 49) working in the practice.

For the Malaysian respondents, the majority of responses also came from female veterinarians (68.7%, n = 180). However, Malaysian respondents tended to be more recently qualified than UK respondents (from 2011 vs 2001 to 2010). The majority of Malaysian respondents practised in an urban area (62.6%, n = 161), the majority of whom working as small animal practitioners (54.6%, n = 143). When asked about the number of veterinarians and veterinary nurses in the clinical practice where they worked, 51.6 % (n = 136) reported there were 1-3

veterinarians and 42.9 % (n = 111) reported there were 1-3 veterinary nurses/ assistant veterinary officer (AVO) in their clinical practice.

Differences between knowledge, attitudes and capabilities of UK and Malaysian veterinarians towards cat pain

The application of knowledge in cat pain

This section of the questionnaire explored veterinarians' knowledge of cat pain, consisting of (i) their

level of knowledge and skill in recognizing cat pain, their ability to manage cat pain and (ii) their ability to assess cat pain and their methods of assessing it. More details in Figure 1.

Respondents were also asked about the usefulness of sources for continuing education, and from where respondents would seek more information about cat

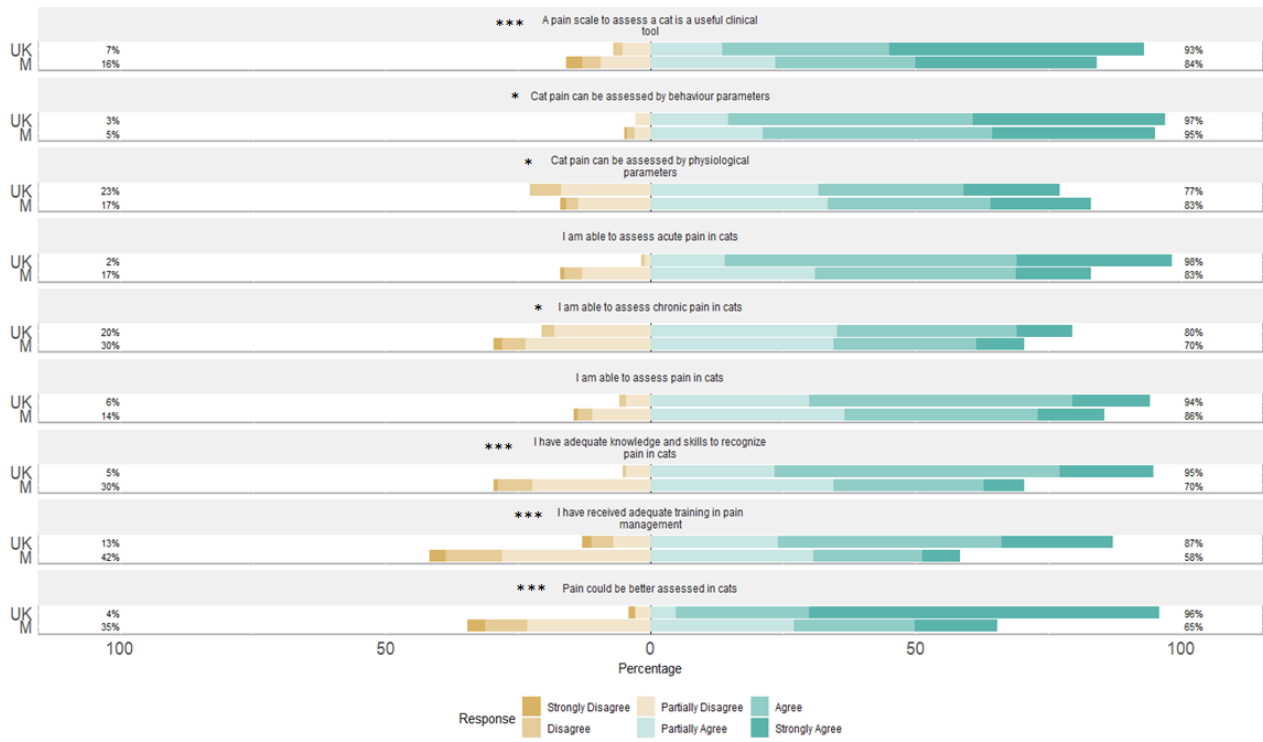


Figure 1. Proportion of veterinarians' difference between responses and country. Note: * P < 0.05, ** P < 0.01, * P < 0.001**

Table 2. Median, mean and standard deviation (SD) of veterinarians' difference between responses and country.

Attitudes to cat pain	UK		Malaysia		P-value
	Median score	Mean ± SD	Median score	Mean ± SD	
A degree of pain is required to stop cats being too active after surgery.	1.00	1.55 ± 1.085	4.00	3.85 ± 1.794	P < 0.001
Surgery does not usually result in sufficient pain to warrant analgesic therapy.	1.00	1.11 ± 0.514	2.00	2.83 ± 1.710	P < 0.001
Analgesia is always beneficial.	6.00	5.49 ± 1.020	5.00	5.02 ± 1.130	P < 0.001
Pain prevention is better than pain relief.	6.00	5.66 ± 0.841	5.00	4.94 ± 1.220	P < 0.001
The client will not pay for analgesia.	1.00	1.65 ± 1.030	2.00	2.34 ± 1.250	P < 0.001
I have sufficient knowledge of pain relief in cats.	5.00	4.58 ± 0.987	4.00	3.94 ± 1.080	P < 0.001

6 answer options: 1 = Strongly disagree, 2 = Disagree, 3 = Partial disagree, 4 = Partial agree, 5 = Agree, 6 = Strongly agree

Wilcoxon Signed-Rank test showed the difference between the UK and Malaysian veterinarians' responses towards six attitudes statements.

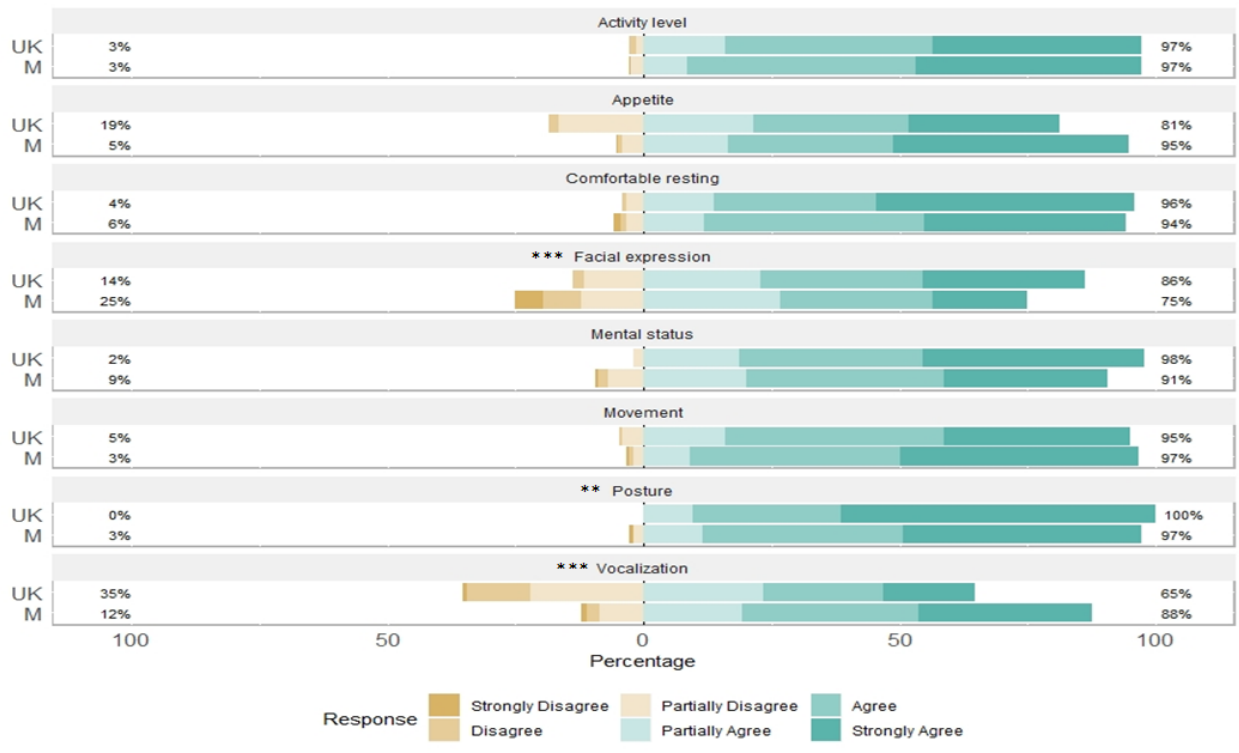


Figure 2. Prevalence of respondents towards cat pain indicators and country. Note: ** P < 0.01, * P < 0.001.**

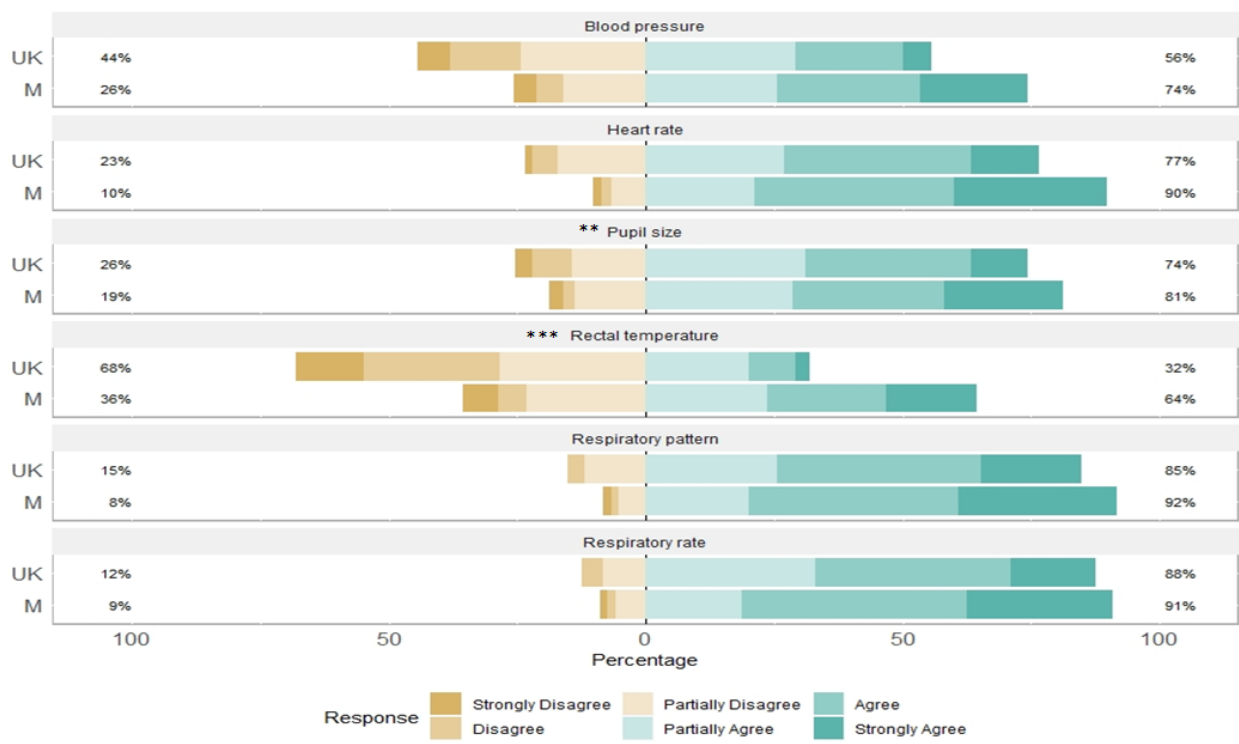


Figure 3. Prevalence of respondents towards cat pain indicators and country. Note: ** P < 0.01, * P < 0.001.**

pain. Veterinarians from both countries chose clinical experience most often as their most useful source for continuing education (UK: 44.7%, $n = 72$, Malaysian: 60.5%, $n = 141$), followed by articles (41.6%, $n = 67$) and formal education (40.4%, $n = 65$) for UK and seminar/workshop (50.9%, $n = 118$) and conferences (45.1%, $n = 105$) for Malaysia. However, there is only one significant difference between countries: concerning whether clinical experience is a useful source for updating and maintaining skill in managing cat pain, Malaysians were more likely to strongly agree that it is, than UK vets ($W = 21212$, $P = 0.018$, $r = .11$).

Attitudes to cat pain

Overall, respondents from the UK and Malaysia strongly agreed with the statement ‘*cats experience pain*’ (UK: 65.5%, $n = 112$, Malaysia: 71.4% $n = 187$) and [cats] ‘*have the same physiological apparatus like humans do*’ (UK: 68.4%, $n = 117$ and Malaysia: 43.5%, $n = 114$), and there was no significant difference between countries in their likelihood to agree with these statements. However, there were significant differences for six attitudes statements (Table 2).

Useful indicators for assessing cat pain

The majority of UK respondents agreed that posture (61.4%, $n = 89$) was an extremely useful indicator for assessing pain in cats, followed by comfortable resting (50.3%, $n = 73$) and mental changes (43.4%, $n = 63$). For Malaysian veterinarians, the greatest number of veterinarians rated posture (46.7%, $n = 114$), movement (46.7%, $n = 114$) and appetite (46.1%, $n = 112$) as useful indicators to assess cat pain (see Figure 2 and 3).

Further analysis showed that there were five significant differences in terms of the usefulness of cat pain indicators between veterinarians from the UK and Malaysia. More number of respondents from UK than Malaysian respondents scored “extremely useful” for facial expression ($W = 13782$, $P < 0.001$, $r = .18$) and posture ($W = 15013$, $P < 0.01$, $r = .14$) as cat pain indicators. In contrast, more number of respondents from Malaysian than UK respondents agreed that vocalization ($W = 23516$, $P < 0.001$, $r = .27$), rectal temperature ($W = 25314$, $P < 0.001$, $r = .35$) and pupil size ($W = 20404$, $P = 0.01$, $r = .13$) were useful indicators of cat pain.

Pain score

Medical conditions

There was little difference identified between both countries on the perception of the painfulness of each medical conditions (Figure 4). However, most Malaysian veterinarians considered (a) Lower Urinary Tract Infection (LUTI) ($W = 27626$, $P < 0.001$, $r = .29$) and (b) chronic Degenerative Joint Disease (DJD) ($W = 27656$, $P < 0.001$, $r = .29$) as “severely painful” compared to UK veterinarians who scored both conditions as “moderately painful”.

Both countries scored (c) carnassial tooth abscess and (d) constipation as “moderately painful”, however, this was shown by higher proportion of Malaysian veterinarians than UK veterinarians ((c) carnassial tooth abscess, $W = 24358$, $P < 0.002$, $r = .15$, and (d)

constipation, $W = 27772$, $P < 0.001$, $r = .29$). Because UK veterinarians more split in their responses between moderately and severely painful for these conditions.

Surgical procedures

Similar findings were reported for the surgical procedures as to the medical conditions above. Overall, the responses were broadly similar between the two countries (Figure 5). However, most UK veterinarians were more likely than Malaysians to consider surgical procedures (e.g. abdominal exploratory-laparotomy ($W = 16451$, $P < 0.001$, $r = .17$), diaphragmatic hernia repair and ($W = 17524$, $P = 0.008$, $r = .13$), ovariohysterectomy (flank approach) ($W = 17331$, $P = 0.007$, $r = .13$)) as “severely painful”. UK veterinarians also were more likely to consider castration as “moderately painful” than Malaysian veterinarians ($W = 18059$, $P = 0.027$, $r = .11$).

Cat pain management

The decision to prescribe analgesia in cats

About 70% of UK veterinarians said their decision to provide analgesia for cat patients was strongly impacted by contributions from veterinary nurse colleagues, compared to 28% of Malaysian veterinarians, and this was significantly different ($W = 9263$, $P < 0.001$, $r = .47$).

Rating the importance of the administration of analgesia in cats

The next question asked the respondents to rate the importance of providing analgesia for cat pain for a list of medical conditions and surgical procedures on a 6-point Likert scale. Overall, veterinarians from both countries showed a similar response with a slightly different level of agreement towards the question. Most of them scored “important” in regard to providing analgesia for conditions such as acute necrotizing pancreatitis ($W = 9158.5$, $P < 0.001$, $r = .50$), carnassial tooth abscess ($W = 11416$, $p < 0.001$, $r = .35$), lower urinary tract infection ($W = 11892$, $P < 0.001$, $r = .33$) and chronic Degenerative Joint Disease ($W = 14994$, $P < 0.001$, $r = .19$). UK veterinarians tended to rate the provision of analgesia more strongly (they scored “extremely important to provide analgesia”) than Malaysian veterinarians (they only scored “important to provide analgesia”). Interestingly, there is a different response to the question of whether analgesia should be administered for constipation. While many of the UK veterinarians scored “important to provide analgesia” for constipation, Malaysian veterinarians scored “partial” or, “not important” to provide it ($W = 11674$, $P < 0.001$, $r = .32$).

The availability and duration of analgesia postoperatively

The availability and duration of analgesia when prescribed after surgical procedures was reported by the UK and Malaysian veterinarians. Overall, most respondents from both countries reported that they prescribed analgesia for all surgical procedures. However, UK veterinarians preferred to prescribed analgesia for a slightly longer time than Malaysians for post-operative Ovariohysterectomy (OVH), castration, abdominal exploratory laparotomy and diaphragmatic hernia repair.

Figure 4. Average pain scoring for medical conditions by country.

Note: ** P < 0.01, *** P < 0.001.

Pain score chart:

- 1: No pain,
- 2-4: Mild pain,
- 5-7: Moderate pain,
- 8-10 (Worst pain): Severe pain.

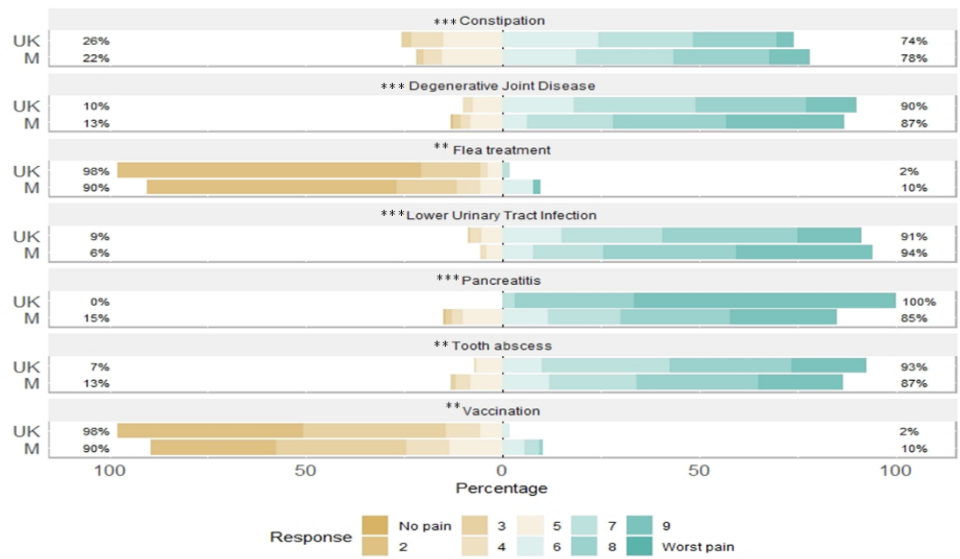
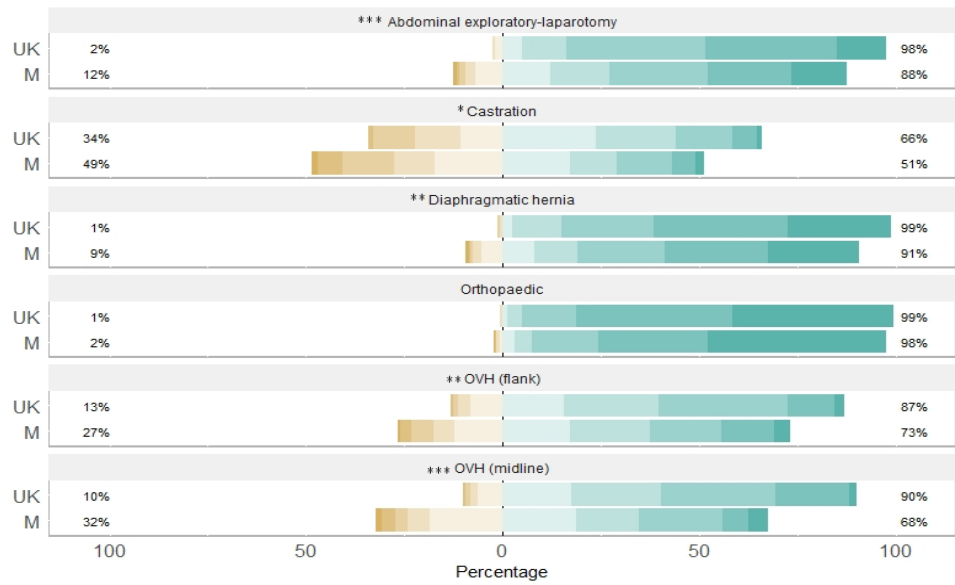


Figure 5. Average pain scoring for surgical conditions by country.

Note: * P < 0.05, ** P < 0.01, *** P < 0.001.

Pain score chart:

- 1: No pain,
- 2-4: Mild pain,
- 5-7: Moderate pain,
- 8-10 (Worst pain): Severe pain.



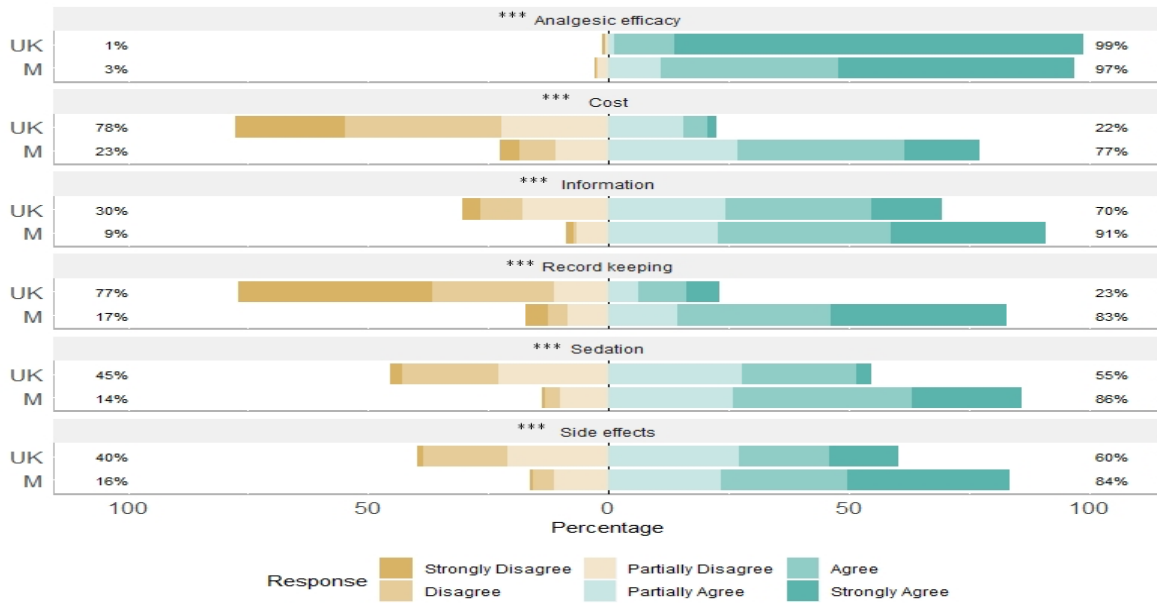


Figure 6. Proportion of veterinarians regarding factors influencing the choice of drug (Opioid) in cat pain
 Note: *** $P < 0.001$.

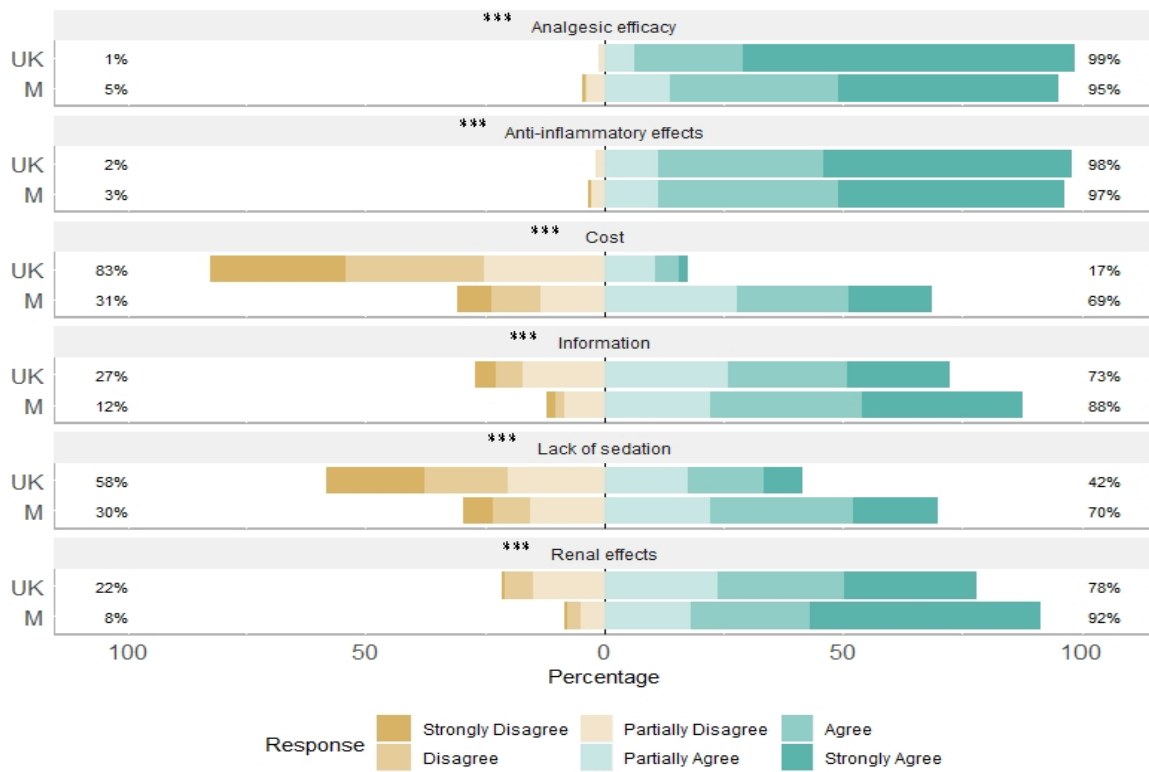


Figure 7. Proportion of veterinarians concerning factors influencing the choice of drug (NSAIDs) in cat pain.
 Note: *** $P < 0.001$

Factors influencing the use of Opioid and NSAIDs in cats

Malaysian respondents agreed more strongly than those from the UK with most statements about factors contributing to their choice of Opioid and NSAIDs in cat pain: the cost, the need for record-keeping, side effects, sedative effects, and the availability of relevant information. UK respondents were more willing to use both types of drugs owing to their efficacy as an anti-inflammatory and analgesic (Figure 6 and 7).

DISCUSSION

This study characterises the attitudes and knowledge of Malaysian and UK veterinarians towards cat pain, in 2017. To our knowledge, this is the first study to examine the attitudes of veterinarians with regard to cat pain in Malaysia.

The majority of participants who responded from both countries were women, which is similar to the previous studies (Dohoo and Dohoo, 1996; Hewson *et al.*, 2006; Beswick *et al.*, 2016). However, Malaysian respondents were twice as likely to be male than those from the UK, perhaps because the majority of Malaysian veterinarians are male. More Malaysian respondents graduated in the 2010s, and practice in urban areas, than UK respondents who were more likely to graduate in the 2000s and practice in small cities or towns. There may be an implication that internet availability is more limited in non-urban Malaysian areas, but it is not possible to be certain of this. From this study, we can see that most of the Malaysian participants are considered to be “young” veterinarians because they had less than 10 years’ experience in practice.

There are a number of potential limitations to this study’s conclusions. It was not possible to calculate the exact response rate of both countries because the participation in the questionnaire was voluntary. In addition, the questionnaires were distributed through many sources such as by email, social media (e.g.: Facebook, Twitter), website and post. In both countries, the respondents may be biased merely by taking an interest in the subject matter of the questionnaire and consequently they took the time to complete the questionnaire (Hunt *et al.*, 2015). In this study, we can see that for both countries the majority of respondents were small animal practitioners, which is not surprising considering the study was aimed at the small animal practitioner community in both countries. There were small number of mixed practice veterinarians answering the survey and this could lead to some of their answers being less knowledgeable than those that focus on small animals as for example, they may have less awareness of the management of pain in cats. However, because of the very small subset (UK, n= 16 (9.4%), Malaysia, n= 50 (19.1%)) of mixed practice veterinarians in this survey, this effect was not analysed systematically.

There may also be cultural differences between the countries which affected the questionnaire responses. For example, responses from UK veterinarians were more often to the extremes of the Likert scales (“strongly agree” or “strongly disagree”) whereas Malaysian respondents tended to express less strong agreement, or disagreement and hence be found around the middle of the scale. A potential explanation could be the cultural differences seen in Asian and Western societies, between individualism and collectivism (Lee *et al.*, 2002). Individualism emphasizes qualities such as uniqueness and difference (Markus and Kitayama, 1991; Lee *et al.*, 2002). This often characterizes cultures such as Western societies, which promote the individual’s freedom to express personal opinions free from undue societal expectation (Lee *et al.*, 2002). Thus, UK responses potentially evidenced cultural individualism by tending to select extreme answers. In Asian societies notable for a collectivist culture, there is an expectation of harmonious interpersonal relationships which are particularly highly valued (Lee *et al.*, 2002) and one way to achieve this is to make sure one’s answer to a question is unlikely to be too different from another’s. We might see this as a tendency to be less extreme in answering questions. This may explain why we see our Malaysian respondents tending to provide less extreme answers. Even though there was a potential culturally-affected difference in responses between Malaysian and the UK, it is possible to generalize the results for the purposes of the present study. This is due to the coherence of the generally positive trend of responses between countries.

Overall, veterinarians in both countries reported positive attitudes towards the management of cat pain. However, when asked to what degree they agreed with the statement ‘*A degree of pain is required to stop cats being too active after surgery*’, about half of the Malaysian respondents “partially agreed” with the statement. These findings are in line with previous research in the UK, 1999 (Capner *et al.*, 1999; Raekallio *et al.*, 2003). Historically, pain was believed to be beneficial for animals, in order to restrict movement after surgery and thus prevent further injury (Epstein *et al.*, 2015). However, advances in knowledge of the physiology and mechanism of pain in animals (Kongara *et al.*, 2016), means that animal pain is now described in terms similar to the scientific description of human pain (Williams *et al.*, 2005), particularly with regard to its development, conduction and modulation. Animals (for example, dogs and cats) share similar neural pathways to humans in regards to pain (Partridge and Rossmeis, 2019), so a strong case can be made that animals also feel pain (Epstein *et al.*, 2015). There was a noticeable change in UK veterinarians’ attitudes towards the use of analgesia to treat cat pain compared to findings conducted during 1996-1997 in the UK (Lascelles *et al.*, 1999). Changes in attitudes towards cat pain and analgesia among UK veterinarians with regard to knowledge and awareness

of animal pain and pain management could be due to significant improvement in veterinary education and practices in the UK (Farnworth *et al.*, 2014). In order to enrich Malaysian veterinarians' attitudes and knowledge with regards to animal pain and management of pain, UK and Malaysian veterinary communities could undertake knowledge transfer activities between these two countries; exchanging views, training and sharing of best practices with regards to pain perception, handling and other topics. Malaysian veterinarians' reported that they found some types of continuing education resources "useful", so these could be further developed, for example, the development of new forums for discussion, webinars, online discussions and workshops would all enhance the educational resources available to Malaysian veterinarians on cat pain. These also have been indicated as one feature of OIE's Global strategy for the further improvement of animal welfare worldwide (World Organisation for Animal Health, 2017).

Malaysian veterinarians were less likely to "strongly agree" that 'pain could be better assessed in cats', than UK veterinarians. Bearing in mind the tendency for Malaysians to avoid the extremes of scales, this is still an interesting finding. It may be that Malaysian veterinarians are already competent at assessing pain in cats and so their response here is accurate. In this study, Malaysian veterinarians reported preferring to assess cat pain by using physiological and behavioural parameters equally, whereas, from the UK veterinarians responses, most of them preferred behavioural indicators rather than physiological indicators to assess cat pain. It is now accepted that pain assessment in cats is not only based on physiological parameters but behavioural parameters (Epstein *et al.*, 2015), and in clinical settings, this can be challenging as cats may experience multiple negative emotions (e.g. stress, fear and anxiety) at once, because they find the clinical environment stressful (Väisänen, 2007) which later may affect the use of physiological parameters for assessing pain in cats. Therefore, a greater understanding of pain behaviours among veterinarians and Malaysian veterinarians, in particular, would be helpful in the assessment of pain in cats. The increased confidence of Malaysian veterinarians in their methods of assessing pain may, in fact, be based on a misunderstanding of the relative importance of physiological and behavioural measurements of pain.

As presented, pain is multidimensional experiences that involve not only physical sensation but also psychological experiences. Findings showed that most UK veterinarians agreed that physical (e.g.: posture) and psychological (e.g.: comfortable rest and mental changes) were useful indicators for assessing pain in cats. But, fewer Malaysian veterinarians chose psychological as the useful signs of cat pain. This could compromise the cat patients' welfare. To improve, veterinarians are required to understand feline normal behaviours. However, a study conducted by Kogan and

colleagues reported that veterinarians had insufficient feline behavioural knowledge and this could be due to a few reasons (Kogan *et al.*, 2020). For example, a shortage of professionals and training in this area caused veterinarians to have less confidence to assess and manage cat behavioural health issues (Juarbe-Díaz, 2008; Calder *et al.*, 2017; Kogan *et al.*, 2020). At the time of writing, there are no formal feline behavioural health courses in the Malaysian veterinary curriculum. There are specialist courses on feline (and canine) medicine, but the extent to which behaviour is taught or even mentioned is not clear. As an understanding of behavioural health would improve all aspects of cat welfare, it is recommended. In a personal communication (U. Kaka, personal communication, December 21, 2021), the awareness and teaching about the use of pain scoring tools (e.g.: The Glasgow Feline Composite Measure Pain Scale (CMPS-Feline) and Feline Grimace scale) have been introduced into the curriculum for the years 4 and 5 at DVM since February 2020. However, there is no information about the efficacy of the use of pain scoring tools among students, so future studies could investigate this- i.e. in terms of their understanding to use these tools and in particular, apply in practice

Urinary Tract Infection (UTI) and chronic Degenerative Joint Disease (DJD) were listed as more severely painful for cats by Malaysian veterinarians than by UK veterinarians. This can be related to the types of case presentation in clinical practice in Malaysia and the UK. Most of the cases received by the UK veterinarians could be early-stage cases and so could still be manageable. In the Malaysian cases, a number of them are presented in the late stage by clients (Lyn *et al.*, 2012). Lyn *et al.* (2012) in a retrospective study, reported that the common clinical disease in cats in University of Veterinary Hospital Malaysia was kidney disease (33%) which included Urinary Tract Infection (UTI). The highest frequency of the disease occurred in geriatric cats. As the cost of treating this disease is prohibitive, owners of these cats usually only sought treatment when the cats were very unwell (Lyn *et al.*, 2012). However, veterinarians from both countries took the view that these cats require analgesia, which is a positive movement in better providing good welfare and management of pain in cats.

Many cat gonadectomy patients are discharged without receiving sufficient analgesic interventions (Farnworth *et al.*, 2014). Although the provision of analgesia on discharge was not directly questioned in this study, participants were questioned in both countries about the duration of analgesia prescribed for different types of surgical procedures in cats, within a set of specified time periods. Most participants prescribed analgesia for 24 hours or less post-ovariohysterectomy. According to WSAVA Global Pain Council's Pain Management Protocol for castration and ovariohysterectomy, post-surgery treatment of these cases may require analgesia for up

to three days after surgery (Mathews *et al.*, 2014). One experimental study looking at the requirement of analgesia for OVH and castration in cats and dogs proved that the number of female patients receiving rescue analgesia was greater than the number of males patients receiving it (Quarterone *et al.*, 2017). In the experiment, the animals received meloxicam (0.1 mg/kg body weight (BW), orally) and acepromazine (0.05 mg/kg BW, intramuscular (IM)) 1-2 hour prior surgery (Quarterone *et al.*, 2017). Then fentanyl (2 µg/kg BW, IV) was given as intraoperative analgesia (Quarterone *et al.*, 2017). Rescue analgesia is the administration of extra analgesia post-operative surgery based on the results of pain assessment. This difference in males and females receiving rescue analgesia could be due to the type of surgical procedures influenced by the degree of surgical trauma. For example, for castration, involves the removal of testicles which are external to the body. OVH involves the exploration internally, the excision of a number of muscles and tissues hence the pain endured by the female cats may be more than male cats. In the study, pain scoring tool such as the UNESP-Botucatu Multidimensional Composite Pain Scale (UBMCPS) for cats was used to evaluate the pain experienced by cat patients.

In this study, we asked about what influences the respondents in their choice of Opioid and NSAIDs in pain management in cats. Malaysian veterinarians were more concerned about the cost, side effects and record-keeping requirements of Opioid and NSAIDs for use in cats. But, for UK veterinarians, they were more concerned about the efficacy of both drugs as anti-inflammatory and as an analgesic. There are similarities between the attitudes expressed by Malaysian veterinarians in this study and those described by Brazilian (Lorena *et al.*, 2014) and South African veterinarians (Joubert, 2001). For example, the side effects of NSAID on the renal function. However, the side effect was reported very rarely in healthy cat patient (Lascelles *et al.*, 2007) if they are used correctly (Gurney, 2012).

Malaysian veterinarians reported that they were usually the sole decision-makers for providing analgesia to cats; however, in the UK such decisions were made collaboratively, where veterinarians took contributions from other veterinarians, colleagues and importantly, veterinary nurses who have received formal training before their employment within the veterinary practice. This training equips veterinary nurses with skills and knowledge which is a valuable resource for veterinarians in their decision making about analgesia for cats. In Malaysia, veterinary nurses/AVO do not receive such formal training, which may account for the difference between decision making in the UK and Malaysia, as Malaysian veterinary nurses are not formally trained.

Overall, participants rated all listed resources in the questionnaire as quite useful for future continuing education. Clinical experiences were reported as being

beneficial for facilitating continuing education in cat pain management by veterinarians in both countries. Similar findings were reported in previous studies in both the UK and New Zealand (Lascelles *et al.*, 1999; Williams *et al.*, 2005; Beswick *et al.*, 2016). Therefore, in order to develop an understanding of pain in cats, as well as the skill to recognize it, newly graduated veterinarians are encouraged to work with those veterinarians who already have expertise in this field of practice. However, the requisite length of experience for developing such expertise could not be specified as this could vary between individual practitioners.

Together with attendance at seminars and conferences, Malaysian veterinarians rated online tools as “useful” for obtaining information about cat pain management. On the basis of this finding, it is clear that the internet is an effective medium for providing educational interventions to Malaysian veterinarians.

CONCLUSION

In summary, the results from this present study revealed that UK and Malaysia veterinarians’ attitudes towards cat pain do not significantly differ in many key aspects. Both countries also showed positive responses to the use of analgesia in cats.

There were some key differences suggesting that Malaysian veterinarians had less understanding of pain relief, fewer worries about the effects of analgesia, and a lack of understanding of the importance of cat behaviour for pain assessment than UK veterinarians.

Therefore, the most important result of this study is not the overall differences between countries, but the need for continued focus in both the UK and Malaysia on education and training of current and future veterinarians with regard to cat behaviour, the recognition and management of pain in cats and how this impacts cat welfare.

CONFLICT OF INTEREST

None of the authors of this paper has any financial or personal relationship with other people or organisations that could inappropriately influence or bias the content of the paper.

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