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Mindset and its relationship to anxiety in clinical veterinary students

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Abstract (200)

This study investigated anxiety, one aspect of mental wellbeing, in fourth year veterinary students prior to the final clinical section of their course (intramural rotations, IMR). It explored the relationship between reported anxiety and 'mindset': an individual's view on the ability to develop (e.g. improve intelligence). Questionnaires were completed by 130 students. Students were mindset typed for ability and personality and rated their anxiety towards IMR. Students with different overall mindsets ('strong growth', 'growth' and 'fixed') were invited to participate in focus groups, to discuss causes of their anxieties. Quantitative results indicated 63.1% of students had strong growth or growth mindsets overall, and that females were more fixed mindset-oriented than males. Females reported significantly greater anxiety than males. A fixed mindset view overall, and of ability, were significantly correlated with increased anxiety, while mindset view of personality was not. Students provided various reasons for their anxieties, which differed with mindset. Fixed mindset students (n=2) focused on concerns about knowledge, whereas growth students (n=6) were also anxious about work-life balance and future work. Growth students saw clinicians as future colleagues, rather than intimidating teachers. Students reported an awareness of being graded, although growth students were aware that IMR are learning opportunities.

Introduction

Mental wellbeing issues in veterinarians are acknowledged by the Royal College of Veterinary Surgeons (RCVS) (RCVS 2014a), but their cause is not fully understood. It has been hypothesised that personality traits (Bartram and Baldwin 2010; Crane and others 2015) and the nature of work (Bartram and Baldwin 2010; Platt and others 2010; Gyles 2014) may be an influence, but it is not known when these problems start. Bartram and Baldwin (2010) suggest that the high level of academic achievement needed to enter veterinary training and the demanding nature of the course affects students. A better understanding of the prevalence and causes of mental wellbeing issues in veterinary students is needed to enable educators to reflect upon these factors to improve the mental wellbeing of students, and thus future veterinarians.

There are many facets of mental health. Anxiety has been defined as 'a type of fear usually associated with the thought of a threat or something going wrong in the future, but can also arise from something happening right now' (Mental Health Foundation 2017). The prevalence of clinical

(diagnosed) anxiety is higher in females than males (Martín-Merino and others 2010). Little information exists regarding everyday general anxiety as opposed to clinical disease, but research has shown that females generally have more anxiety than males: 21.5% of UK females over the age of 16 showed signs of depression or anxiety compared to 14.8% of males (Mental Health Foundation 2015).

Several measures have been used within studies of veterinary mental wellbeing, with concerning results. For example, communication with support organisations indicates that three-quarters of contacts with the Veterinary Benevolent Fund's Vetlife Helpline are from females (2015). However, it is noted that this may be due only in part to increased mental health issues in females (Mental Health Foundation 2015) as females outnumber males in the profession (RCVS 2014b) and may show more help-seeking behaviour. The Veterinary Benevolent Fund (2015) also reports that roughly 50% of communications are with under 30 year olds, suggesting higher levels of mental distress or help-seeking behaviour in younger veterinarians. Suicide rates in the veterinary profession also provide evidence of potentially concerning mental health issues. Research has suggested that veterinarians are more likely to commit suicide than the general public (Mellanby 2005; Bartram and Baldwin 2010; Nett and others 2014) and other healthcare professionals (Mellanby 2005). However, although most accept that there are high levels of stress in the profession, some argue that there is little evidence that veterinarians have significantly poorer mental wellbeing than other professions (Platt and others 2012).

Despite these contrasting reports regarding wellbeing, it is accepted that training to be a veterinarian is long and demanding (Bartram and Baldwin 2010). The last section of the course is usually spent in clinics, taking joint responsibility for cases and performing supervised procedures. This emulates working life, which is known to be taxing: 87% of veterinarians from the USA found their job stressful (Platt and others 2012).

Mental and physical wellbeing are linked; mental distress can result in physical illness and vice versa (WHO 2001). Therefore, for veterinary students, mental distress could result in increased sick days, leading to lost opportunity to learn. Furthermore, mental disorders can lead to decreased academic achievement (Patel and others 2007) and have been associated with reduced self-confidence in adolescents (Zhou and others 2018). In the veterinary environment, autonomy and decisiveness are valued highly (Cornell University, n.d., Roder et al 2012). A student's lack of confidence could be detrimental to their learning, as they may be less likely to participate fully in the self-directed learning required to succeed. In addition, anxiety has been shown to negatively affect spatial working and long-term memory (Robinson and others 2013) which may affect veterinary students'

ability to learn practical skills and retain information over the course of their education. In short, mental health issues during veterinary training could decrease student confidence and competence.

Mental wellbeing is not the only factor affecting learning. A student's attitudes can have an effect. It has been suggested that the high level of mental health problems in the profession is due in part to the characteristics required to be accepted onto the veterinary degree (Bartram and Baldwin 2010) including the need to be a high achieving, dedicated individual. Bartram and Baldwin (2010) state that these individuals are at high risk of fear of being discovered to be less intelligent than expectations from society and peers, so-called "imposter syndrome" (Clance and O'Toole 1987; Zenner and others 2005).

One major differentiating aspect of student attitudes to learning is mindset (Dweck 2012). This relates to how individuals meet new challenges and variety, a feature of veterinary study. Some see new challenges as opportunities to learn, even if they initially fail. Such individuals believe that if they find an activity hard, extra work will lead to mastery. This has been characterised as a "growth" mindset. In contrast, others see new challenges as a threat, which might lead to exposing them as being stupid. These individuals do not see ability as an attribute that can be improved but rather a fixed attribute - you are either intelligent or not. These are examples of 'ability' mindsets. Individuals may have a different mindset regarding 'personality'. For example, regarding the ability to change basic things about the kind of person you are (SNRPDP, n.d.).

A "fixed" ability or personality mindset can lead to perverse behaviours such as avoidance of new challenges in the presence of others, leading to a denial of the very learning opportunities that could be helpful to their progress. There are correlations between fixed mindset and both imposter syndrome (Dweck 2012) and perfectionism (Dweck 2013), another trait linked to those who achieve high grades (Knights and Kennedy 2007). Perfectionism's further association with suicidal behaviour (O'Connor 2007) is an example of how mindset, learning and wellbeing are interlinked. A fixed mindset could hinder a student's progress, with consequences for their early career.

Research has begun to map mindset in different years of veterinary undergraduate students; first year (Whittington and others 2017) and second year (Root Kustritz 2017). Until recently, studies did not consider associations between mindset and mental wellbeing, but these studies researched potential links between mindset and mental wellbeing in terms of psychological well-being (Whittington and others 2017) and perceived stress (Root Kustritz 2017). However, these articles have not explored mindset in later years of study, nor investigated differences between students or utilised qualitative research to explore students' reasoning.

This study adds to this research. The study is focused on one aspect of mental wellbeing, anxiety, a common cause of mental distress with known effects on learning (Robinson and others 2013). Measuring anxiety is challenging and there is an abundance of scales available specific to categorising if an individual has an anxiety disorder, or focusing on contexts such as disease. This study uses a simple uni-dimensional scale to allow students to indicate their general anxiety towards one future event, intramural rotations (IMR). The students are from the final, clinical section, of the veterinary course, which is perhaps the most relevant section of training, due to its similarities to practice. The aims of this study were as follows:

1. To identify students' attitudes to learning by mindset typing and evaluate gender differences

2. To investigate the possibility of a correlation between anxiety and mindset

3. To identify the nature of self-reported anxieties experienced by veterinary students at the commencement of IMR.

Materials and Methods

Study participants

Fourth year veterinary students at the Royal Veterinary College (RVC) in 2015/16, n=219. Students enter IMR 17 months before graduating. The majority of university-based compulsory IMR takes place in the university referral teaching hospital (URTH), the focus of this study

Study design

This was a sequential mixed methods study whereby quantitative research informed qualitative research (Morgan 1998). It received ethical approval from the RVC's Clinical Research and Ethical Review Board (URN 2015 1459).

Quantitative study design

Students were invited to participate in an online SurveyMonkey® questionnaire, during the last two days of pre-rotational teaching, by a research intermediary, who has little direct contact with students and no impact on their course progression. Three electronic reminders were given before the questionnaire closed on the first day of IMR; the survey was open for 19 days.

The questionnaire had three parts: mindset, self-reported anxiety and demographics. The mindset section was developed from a Southern Nevada Regional Professional Development Programme

(SNRPDP, n.d.) resource, which was based on Dweck's mindset research. This allowed determination of ability and personality mindsets. Twenty statements were adapted to ensure their relevance to veterinary students. Statements were reordered to reduce bias related to question grouping. The anxiety section required respondents to score subjectively their current anxiety level towards the URTH IMR on a five-point scale as either 'no anxiety', 'some anxiety', 'moderate anxiety', 'severe anxiety' or 'very severe anxiety'. There were also a small number of demographic questions, relating to routes into the veterinary course and career aspirations. Responses were collated by the research intermediary, anonymised, and sent to the research team.

Quantitative analysis

The mindset statements were given scores based on the approach of the original source (SNRPDP, n.d.). These were combined to give each respondent three scores: overall mindset; ability mindset ('growers' agree with the statement 'You can always substantially change how intelligent you are'); and personality mindset ('growers' agree with the statement 'You can always change basic things about the kind of person you are'). Due to the different number of ability and personality statements, ability and personality scores were corrected to provide scores out of 100 for comparison (Table 1).

Statistical analysis

Statistical analyses were completed using Microsoft Excel 2013 and GraphPad Prism 6. All variables except mindset scores (continuous) were classed as categorical. Analyses performed were as follows: D'Agostino-Pearson omnibus normality test for continuous data; unpaired t-test for comparison of male and female mindset scores; Pearson's rank Correlation Coefficient to assess correlation between ability and personality mindset scores; ANOVA for comparison of mindset and anxiety scores, and comparison of mindset and anxiety scores with age group, educational background and career aspiration; and Chi-squared for comparison of anxiety levels of males and females to the URTH IMR. Significance was set at $p<0.05$.

Qualitative study design

At the end of the questionnaire, students were asked if they would be willing to participate in future focus groups, aimed at investigating reasons for reported anxieties, and facilitated by an experienced non-veterinary interviewer (TK), blinded to the group's mindset. Students were invited to participate based on their ability mindset scores: strong growth, growth and fixed (no students had a strong fixed mindset). Growth students volunteered readily, whereas individual interviews were conducted for fixed students due to lack of response. Focus groups and interviews were run

over the fifth to seventh weeks of IMR, according to student availability. Interviews and focus groups were semi-structured, utilising a framework designed by the lead researcher (RB), which primarily asked the students to consider situations on rotations that would make them feel anxious. Interviews were transcribed independently and transcriptions were verified by the interviewer.

The results refer to the growth focus groups as SG (strong growth) and G (growth), and Fa and Fb to represent the two interviews with students reporting fixed mindsets.

Qualitative analysis

Thematic analysis was undertaken by RB, who was blinded to the group's mindset, on each transcript using the Braun and Clarke (2006) framework. This involved creating codes for each data extract and grouping these into possible themes using an inductive method. The themes and sub-themes were created where there was no overlap between sub-themes and where the development of a new sub-theme added to the understanding created through the analysis. Theme development did not depend on the number of references made to a point, and instead on relevance to the research question in accordance with qualitative methods (Braun and Clarke 2006). Iterative discussions were held with TK to enhance credibility, but as per Braun and Clarke's method, only one person, immersed in the data conducted the coding. Mindset results and qualitative results were linked prior to final analysis and manuscript writing.

Results

Quantitative analysis

Demographic characteristics

Of the studied population (n=219), 62.1% (136) completed at least some of the questionnaire. Six incomplete responses were removed. 104 (80%) respondents were female. Most students were aged 20-25 (116; 89.2%) and from the UK (111; 85.4%). Students entered the BVetMed course via multiple routes, although the majority (81; 62.3%) came to the RVC immediately following high school or college. Future career aspirations were reported by the majority as working with small animals (91; 70.0%), followed by farm animals and horses. All proportions are typical of current RVC cohorts.

Mindset scores

Mindset scores revealed that the majority of students could be categorised as growth or strongly growth mindset overall (63.1%; 82). Regarding ability, 70.8% (92) were categorised as growth or strongly growth in mindset, compared to 60% (78) for attitudes towards personality.

All mindset scores were normally distributed, males generally having higher (64.4 ± 2.1 ability, 58.8 ± 2.5 personality) scores, indicating a stronger growth mindset orientation, than females (60.7 ± 1.0 ability, 54.4 ± 1.3 personality). However, there was no significant difference between male and female ability ($p=0.100$) or personality ($p=0.128$) scores.

Ability and personality mindset scores were significantly positively correlated ($r=0.546$ $p<0.0001$).

There was no significant relationship between mindset score and educational background or career aspirations.

Anxiety scores

Sixty percent of students reported moderate to very severe anxiety about the URTH IMR.

Comparisons of male and female reported anxiety levels revealed a significant gender difference ($p=0.0020$) (Figure 1).

Anxiety scores and mindset

Higher anxiety scores were associated with lower mindset scores (Figure 2a,b,c). There was a significant difference in overall mindset score between the grades of anxiety towards the URTH IMR ($p=0.0029$) and in the ability mindset score ($p<0.0001$), but not in the personality mindset score ($p=0.7684$).

Several other variables, including age, educational background, career aspirations and whether students opted out of focus groups, were compared with both reported anxiety and mindset scores, but tests were either not valid due to low numbers or showed no significant difference.

Qualitative analysis

Three students took part in a SG mindset focus group (2 male, 1 female) lasting 70min, three in a G mindset focus group (2 male, 1 female) lasting 60min, and two in individual fixed mindset interviews (both females) lasting 21m and 22m. Example quotations from the mindset groups support the students' position in their allotted group (Table 2).

Three main themes were developed. The themes, subthemes and example quotes are shown in Table 3. The first main theme is 'Course'. All mindset groups felt uncertain about IMR, but the G/SG students also considered future work. The second theme is 'Environment on IMR'. Students were

nervous of case responsibility and possibly looking stupid. While F students remained focused on anxiety about knowledge, G/SG students recognised IMR as a learning opportunity, though with challenges to work-life balance. The third theme is 'Students'. All groups were concerned about working with new peers. F students focused on others' opinions, with teachers seen as intimidating, while G/SG students focused on improving themselves, with teachers as their future colleagues.

Discussion

This study explored the anxieties of veterinary students prior to entering their rotation year, and the influence of mindset. Sixty percent of students reported moderate to very severe anxiety about the URTH IMR. Having a fixed mindset view of ability was related to reports of higher anxiety, as was being female, supporting the first two hypotheses. Reasons given for this anxiety focused on feeling unprepared, either for IMR or life after graduation, peer comparison, views of IMR as either assessments or teaching opportunities, and work-life balance.

Mindset

In this population, 63.1% of students were categorised as overall growth or strongly growth mindsets. Dweck has stated that approximately 40% of the general student population fit into one of the two categories, with 20% fitting partially into either category (Dweck 2008). However, some research has shown that the majority of individuals fit consistently into one of the two categories (Jegathesan and others 2016). Around 50% of human paediatricians have been typed as having a fixed mindset (Jegathesan and others 2016). Rollin (2006) suggests that the majority of veterinarians work with similar ethical principles to paediatricians, including primary consideration towards the welfare of the patient (child or animal), rather than to their carer (parent or owner). Therefore, an equal number of fixed mindset veterinary students may have been predicted. However, these results suggest that the population of veterinary students studied was more growth mindset than the comparable medical professionals. People of a growth mindset are more likely to pursue 'learning goals' rather than fixed 'performance goals', and to value an experience that allows them to learn rather than display their prowess (Dupeyrat and Mariné 2005). Although it would appear to be beneficial to hold learning goals in terms of improving as a clinician, Teunissen and Bok (2013) posit that where patient wellbeing is affected, it may be inadvisable to focus entirely on furthering one's own knowledge, and focus instead on patient outcome. However, in general, students with a growth mindset can better deal with setbacks (Dweck and others 1995), and during IMR, learning goals are likely to be more beneficial, as supervising clinicians can intervene if necessary.

Dweck showed that females are more likely to be fixed mindset than males (2013) which this study mirrored. In particular, high achieving females have an increased likelihood of being fixed mindset and responding helplessly to failure (Dweck 2007). Both fixed mindset students interviewed in the current study were female, with one expressing concern about clinicians expecting her "to know everything". The other was conscious of everyone around her and showed characteristics of 'imposter syndrome'. This is more commonly reported in females, and is linked to fixed mindsets (Kumar and Jagacinski 2006).

Generally, the students interviewed with fixed mindset scores demonstrated fixed views in discussion. However, the growth and strong growth groups, although reporting views that are classically growth, appeared to have some fixed traits as well. The growth group in particular felt anxious about being graded whilst on IMR, despite acknowledging that it is a safe learning environment. This suggests that the 20% of the population that has been reported as fitting into both growth and fixed categories (Dweck 2008) might have emerged in this study as cognitively growth through the way they have rationalised their learning opportunities, although they still had some underlying naïve fixed beliefs and emotions.

This study identified 63.1% growth or strong growth mindset in fourth year veterinary students. It was beyond this study's scope to track changes throughout the course, although this would be relevant to student support. It would be interesting to determine whether students entering veterinary education are inadvertently selected for the course due, in part, to their mindset, and whether their mindset changes as they develop. Previous research has identified that approximately 42.9% of first year veterinary students had growth mindset (compared to intermediate, which was removed from further analysis, and fixed) (Whittington and others 2017) and 70.2% of second year veterinary students had strong growth/ growth mindset (compared to fixed and strong fixed) (Root Kustritz 2017). However, due to the different scales used, different cohorts and veterinary schools studied and varying number of responses, it is not possible to map mindset changes while at veterinary school until longitudinal research is conducted.

Anxiety

A high level of anxiety towards the URTH was reported. A certain level of anxiety can be beneficial (DeMaria and others 2010; Yusoff and others 2010), but severe anxiety has been found to be negatively correlated with memory (Nunes and others 2018; Yousefi and others 2010a) and academic achievement (McIlroy and Bunting 2002; Yousefi and others 2010b). In addition, high levels of stress can result in physical and mental wellbeing deficiencies (Yusoff and others 2010). Mental wellbeing issues as a young person tend to continue into adulthood (Patel and others 2007),

so poor mental wellbeing could become a pervasive trait of veterinarians if it is commonplace in students. It is currently unknown whether high levels of anxiety are due to an inherent susceptibility of students selected for the veterinary course, or whether the training itself, reinforcing trends towards perfectionism in the guise of "best practice", and professional identities ill-suited to certain branches of practice(Armitage-Chan and others 2016), is the root cause of the problem.

Females have been reported to have a higher prevalence of mental wellbeing issues in the medical (Toews and others 1997; Amr and others 2008) and veterinary (Platt and others 2012; Reisbig and others 2012) professions, and in the general population (Tyssen and others 2001), reflecting this study's finding that females generally reported more anxiety than males. It is interesting to note that some studies in the medical field, however, have reported no gender difference in stress levels (Supe 1998; Tyssen and others 2001). The veterinary population is becoming more and more 'feminised' (Allen 2016), so higher levels of anxiety in females during veterinary training may result in higher levels of anxiety in the working population, negatively impacting the mental wellbeing of the profession.

Growth mindset students reported feeling unprepared for future life. Indeed, Garrett (2009) reports that the transition from veterinary student to equine practitioner is a difficult one, with many students opting to enter an internship to 'bridge the gap'. In one study over half of graduates surveyed said their course had poorly or very poorly equipped them for interacting with clients (Gilling and Parkinson, 2009). Recent research on clinical reasoning suggests some students have a deficit in skills when starting their first job (Vinten and others 2016). It is disappointing that students do not feel appropriately prepared for life as a clinician after five years of full time training. This perceived inadequacy could result in increased stress when entering a first job.

Unsurprisingly, many students reported decreased feelings of anxiety about working with species with which they were more experienced, although statistical comparison was not valid due to sample size. This could be investigated further, as increasing students' familiarity with different species throughout the course could reduce anxiety about IMR.

Mindset and anxiety

Although mindset views of personality did not correlate with anxiety level, students with a fixed mindset view of ability (intelligence) were significantly more likely to report being anxious than students with a growth mindset towards ability. Fixed mindset students have been identified as more 'performance' driven (Dupeyrat and Mariné 2005), and have a helpless response to failure (Dweck and Leggett 1988). Although all mindset groups in the present study reported some aspects

of fear of failure, which mirrors recent results of Cardwell and Lewis (2017), the fixed mindset students were especially anxious about being questioned, compared their achievements to others' and were intimidated by others' knowledge. In the IMR environment where students cannot know everything, success is not guaranteed, and patients may die, these experiences may be taken as a sign of inadequacy (Dweck 2013), especially for fixed mindset students, which will be detrimental to learning.

This study has demonstrated that it is simplistic and inaccurate to think of fixed mindset students as being anxious and growth mindset students as not. However, one interesting finding is that "constructive anxiety" may not just relate to the level of anxiety (Meharg 1988), it may also relate to its effect. Thus the anxiety of growth mindset students, focused on learning to remedy their feelings of lack of preparedness for practice and their wellbeing, including work-life balance, is likely to be a much more constructive perspective than anxiety focused on exposure and limitation.

Anxiety is only one factor that affects mental wellbeing of veterinarians and there is little research on other such factors and how these are affected by mindset. This is an area for further study.

Limitations

Interpretations of differences between genders should be understood in light of the gender disparity in questionnaire results (20% respondents were males); however, this gender proportion reflects current ratios at veterinary schools.

Focus groups were smaller than ideal. Due to the nature of IMR, students were in various locations at any one time; therefore, students with the desired mindset scores were not available concurrently. Notably, multiple invitations were required to secure even two fixed mindset interviews. This is perhaps not surprising, since the interviews exposed anxieties, and a classic fixed trait is fear of exposure and being seen as less able. Despite low numbers, the purposive sampling of all mindsets allowed a range of opinions to be explored. It was not possible to hold the focus groups before students started IMR. Anticipation of an event has been shown to cause more anxiety than the event itself (Davidson and others 2000), so student reports of anxiety during focus groups may differ compared to those expressed in the questionnaire, despite them being asked to think back before IMR started. When students were asked whether their anxiety had changed, they all reported that it had stayed the same or decreased since starting IMR.

The majority of statements used (SNRPDP, n.d.) for mindset typing related to ability mindset, therefore personality score was less discriminating than ability score. Veterinary students in this population were more growth mindset oriented for ability than personality and only the ability

mindset had a significant correlation with anxiety. However, it is hard to determine whether these results may be due to lack of discrimination on the part of personality scores. Further research is needed to determine this. Finally, anxiety is challenging to measure and usually involves self-reported data, as in this study. Typical anxiety scales may relate to specific disorders or populations. This study focused on general (not clinical) anxiety towards one specific future event and therefore used a simple uni-dimensional scale.

In conclusion, this study found that there is a significant level of anxiety about clinical rotations reported by this veterinary student population, and that this is linked to gender and mindset. Having a fixed mindset view of ability and being female were linked with an increased level of reported anxiety towards IMR. In addition, the factors described as causing anxiety varied with mindset. Fixed mindset students were, in general, more concerned about knowledge and their lack thereof, whereas growth mindset students were aware of learning opportunities and that clinicians were their future colleagues, but wanted time to relax outside IMR to become effective veterinarians. Reported anxiety levels in the student body are concerning, especially given that these students, as they realised, are the future of the profession.

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Table 1

Composition of mindset categories based on the Southern Nevada Regional Professional Development Programme Scheme. Ability and personality scores were corrected to provide scores out of 100 to allow comparison.

Mindset category	Overall mindset score	Ability mindset – corrected score	Personality mindset – corrected score
Strong growth	45 – 60	76 – 100	78 – 100
Growth with some fixed ideas	34 – 44	57 – 75	56 – 77
Fixed with some growth ideas	21 – 33	36 – 56	33 – 56
Strong fixed	0 - 20	0 – 35	0 - 33

Table 2. Mindset groups and representative example quotations

Mindset Group	Example Quotations [participant identifier]
Fixed Ability mindset score range: 48-55	'if you have a more confident, extroverted personality, you're like, go for it and ask for things, you'll get more out of it and that's hard for someone like me but I don't blame anything for it, it's just me!' [Fb, female]
	'I know they have the learning advice centre, I've personally never gone, I've thought about it but been a bit … reluctant, anxious to go!' [Fb, female]
Growth Ability mindset score range: 64-67	'my anxieties have gone from what a normal university student would be like: make sure you get good grades, not try and disappoint my parents, the competition aspect and stuff like that and what am I doing on Saturday night sort of thing, to now I worry about am I making the most of my education, am I going to make the most of my placements so I can be the best vet I want to be, optimise these training experience because there's very few times in my professional career I'm going to be surrounded by such a breadth of specialists, who have such an insight to teach me.' [G, Participant A, male]
	'something that's changed throughout my life because before, I didn't like hectic, busy things but now I feel I really enjoy the busy days … I love those days and I love like the challenge of difficult clients or difficult animals.' [G, Participant C, female]

Strong Growth Ability mindset score range: 76-90	'I think when I was younger, I used to get quite anxious about talking to new people and public speaking … all the placements I think have really helped, or meeting lots of people at uni or things like that, so I think that's probably helped a lot so when you get to rotations, you're a bit more confident to meet lots of new people' [SG, Participant C, female]
	'[It's] not just the fear of looking silly because essentially that's why we're here, we're all here to look silly just now and we're all here to ask the stupid questions' [SG, Participant B, male]

Table 3. The three main themes and sub-themes developed to explain anxiety. Example quotations are provided, with participant information, and an indication if this sub-theme related to a specific mindset group, or spanned all groups

Main Theme	**Sub-theme**	**Example quotation**	**Mindset Groups affected**
Course	Unprepared - knowledge	'…it's the depth of my ignorance that now really terrifies me' [SG, Participant C, male]	All
	Uncertainty – what to expect	'as much as there is [advance] information…until you've done a couple of days, you don't actually know what to expect, as in knowledge wise, what you're going to be doing, how busy you're going to be, what's your working day going to be like?' [G, Participant A, male]	All
		'I was kinda [sic] expecting them to expect me to know everything which I certainly do not.' [Fb, female]	
	Species effect	'…personally, I would be less anxious in the [hospital] than farm… I'm more comfortable with small animals.' [Fb, female]	All
	Disparity between course and real life	'I feel … that I can pass my exams and be a rubbish vet…there's nothing on how well you communicate, how well you empathise and there's nothing on how well you handle animals, how well you do practical skills, it's all literally really in-depth clinical knowledge.' [G, Participant B, male]	G
	Concern about future career in veterinary medicine	'One of the anxieties I have developed is actually worrying that I won't enjoy it… the job isn't what I think it's going to be and so yes, that's another anxiety that's come in.' [G, Participant B, male]	G

	Deficit in practical skills	'People just assume you've got it. You get into practice and they're just like, "give it an injection", you're like "college has never taught me that" and if you say that to a vet, they'd laugh at you, "your college has never taught you how to inject an animal?" that's embarrassing.' [G, Participant B, male]	G and SG
Environment on IMR	Responsibility for caseload	'there's always going to be that fear that you mess up and obviously your mistakes, if they're small, it's not a big deal, it's just a little bit embarrassing but then if they're large, you literally kill something … I don't want to hurt any animals and then that animal's connected to a person who's seriously going to be upset.' [Fb, female]	All
	Fear of feeling stupid to clinicians and owners	'you don't want to give a bad impression … feeling like "I'm useless, why have I made that mistake? Why have I done this? They think I must be stupid."' [G, Participant A, male].	All
		'being asked a question in front of an owner and if you don't know the answer, it makes you look really silly and feel intimidated' [SG Participant B, female]	
	Individual questioning	'I guess worried about being asked questions on rounds and it was the first time that we would get one on one questioning… I was a bit worried about that one on one brain picking.' [Fa, female]	F
	Time management	'some rotations drag you back in after you've finished rounds…when that takes up three hours of your time … no wonder people don't have a work/life balance if in your final year before you graduate, all you're used to being is getting in at 7[am], leaving at 9[pm]' [G, Participant A, male]	G
	Learning opportunity	'I'm being watched by someone who's grading me …that does lead to stress because you're like, … "If I make a mistake, how is that going to impact?" when what you should be thinking is "this is a learning opportunity, this is the safest environment I ever have to make a mistake" but because you're being assessed, you don't think like that, you think it's an exam, this is what I need to do, which it's not and they do make perfectly clear it's not…' [G, Participant A, male]	SG (G)
Students	Personality trait affects anxiousness	'the personality of some people, just a lot more placid and chilled… some people are able to [think they'll be ok] whereas some people imagine the worst case scenarios and	All

		need to eat a text book before they turn up.' [Fa, female]	
	Fear of feeling stupid, comparison with others	'I think that consciousness of everyone else's performance has become more of a thing as I've got maybe a bit more shy [sic] about knowledge sharing or whatever, than I would have been just to say something in A Level' [Fa, female]	All
	Working with peers	'something else that's a bit of a worry is how well the rotation group is going to work together and how well individuals will get on with each other because I think it can either make the whole year really good or it can make it really horrendous' [SG, Participant B, female]	All
	Peer reports – reassure or create a reputation for stressful rotations	'other students say things that are highly ranked as being the most terrifying rotations are things like medicine, anaesthesia, … I can't think of any horror stories that I've been told from any of the other rotations' [Fa, female]	All
	Working with clients	'getting close in a room with a client and an animal is quite nausea inducing at the start but now I've done it and it's not been too bad' [Fa, female]	All
	Focus on others' opinions v Focus on self-improvement	'if you were top of the class in secondary school, it's not going to be the case here, so it's … feeling a bit more conscious of being surrounded by a lot of very intelligent people and maybe not so much being on that spectrum yourself.' [Fa, female]	F
		'I am one of these people that if I'm [bad] at something, I will make myself good at it' [SG, Participant C, male]	G and SG
	Working with clinicians – intimidation by teachers v. Working with colleagues	'a lot of clinicians we're working with have been doing it for 40 years and literally they're top in their field so, it's a bit intimidating because their knowledge is going to be so much greater than yours'! [Fb, female]	F
		'they're our future colleagues rather than our superiors [SG, Participant B, female]…. Yeah it's not that, you know, I am going to be your colleague, I am their colleague now because essentially we are the future of veterinary medicine.' [SG, Participant C, male].	SG

Figure Captions:

Figure 1:

Male and female anxiety levels towards the URTH IMR. There was a significant difference between males and females, with females identifying as being more anxious.

Figures 2a, 2b and 2c:

Overall (2a), ability (2b) and personality (2c) mindset scores compared with anxiety level of students towards the URTH IMR. There is a significant difference between anxiety groups for figures 2a (overall score) and 2b (ability score), but not 2c (personality score). Dotted lines represent cut off points for being growth