Entrustable Professional Activities to Facilitate the Transition from Veterinary Medical Education into Veterinary Practice

Research Project
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Abstract

The veterinary profession is under great pressure as many veterinarians are faced with work-related stress and burnout, resulting in veterinarians leaving practice, mostly within the first years post-graduation. It is speculated that an experienced gap between veterinary medical education and the veterinary practice has a major role in these problems. The entrustable professional activity (EPA) was developed as a tool to be used in competency-based medical education (CBME) allowing abstractly defined domains of competence to be assessed holistically with an outcome-based approach. EPAs are hypothesized to be a useful tool to support the young veterinarian's transition from education to practice, and possibly to reduce work-related stress, increase job fulfilment, stimulate the feeling of engagement and capability, increase satisfaction regarding the received guidance from colleagues, increase awareness regarding one's current competence, and get grip on one's professional development. In this study, 14 recently graduated (< 2,5 years) veterinarians (study group (n=7) and control group (n=7)) filled out two digital surveys (three-and-a-half months apart) to assess their mental wellbeing and work experience during their phase of transition. All participants had a clinical coach, but only the study group discussed three EPAs with their coach to support their professional development, both technically and personally. Additionally, during the two survey moments the study group self-assed their knowledge and skills on the three EPAs using the scale of entrustment and supervision. Data suggests EPAs help to provide a more favorable private life-work balance and decrease work-related stress and are useful tools to support the starting veterinary professional as it provides a clear and appreciated structure to support development.

Key words: entrustable professional activity (EPA), competency based medical education (CBME), competency based veterinary education (CBVE), veterinary professional, burnout, wellbeing, work-related stress

1 Introduction

Starting veterinarians often experience a great amount of pressure when entering the professional field, leading to 16% of them meeting burnout criteria in the first five years after graduation (Mastenbroek, 2017).

It is suggested that providing support during the transition from education to practice is crucial and might help to decrease work related stress, increase engagement and overall well-being. Entrustable professional activities (EPAs), from 2005 onwards progressively introduced in both human and veterinary medical education as a method to support workplace learning, are now suggested as a tool to bridge this gap.

1.1 The Veterinary Profession and Mental Wellbeing

Recently, the well-being of veterinarians and more specifically of the young veterinary professional have drawn attention world-wide (Dawson et al, 2017; Duijn et al, 2019; Fink-Miller et al, 2018; Graves et al, 2019; Hatch, 2005; Heath, 2005; Mastenbroek, 2015; Mellanby, 2005; Routly et al., 2002). A large-scale study by Hatch et al. amongst Australian veterinarians demonstrated that the veterinary profession experiences higher levels of burnout, depression and stress in comparison to the general Australian population aged 18 years and older. Especially females and those within the first 10 years post-graduation scored particularly high (Hatch et al., 2011).

Research conducted in the Netherlands within a group of newly graduated veterinarians demonstrated that 14% of the respondents (n=860) were found to have a burnout, 27% had an increased emotional exhaustion, and 15% had an increased cynicism. On the contrary, 15% of the respondents ranked to be highly engaged and enjoyed a positive and fulfilling relationship with their work. These results among Dutch veterinarians are, however, in accordance with findings among the general Dutch working population (Mastenbroek, 2017). Despite similar results in the general population, work-related stress and veterinarians leaving the profession remains a problem as a shortage of veterinary professionals is growing.

It was also found that the state of mental wellbeing is at its worst during the first couple of years post-graduation (Mastenbroek, 2017), which might be linked to the fact that it takes years for a veterinary clinician to develop certain skills and overcome work difficulties such as time pressure and high expectations of colleagues, pet owners and oneself (Mastenbroek, 2017 & Routly et al., 2002). Research in the human medical field, due to its similarities to veterinary medicine, could be extrapolated to veterinarians. Graduated doctors have been found to experience un(der)preparedness for their tasks (Brennnan et al., 2010). During the transition from university into the clinical workplace, young doctors have to deal with stress, increased responsibilities, uncertainty, inexperience, learning to work both with others and independently, and learning to deal with death. These experiences and especially the feelings of inadequacy, whether accurate or not, have been related to increased occupational stress and burnout (Brennan et al., 2010). Within the veterinary profession, in a study by Routly et al., one in three young veterinarians left their first job in less than two years. For one in six, the main reasons for this were a “lack of support, heavy workload, stress or clashes with staff.” (Routly et al., 2002).

With stress, poor mental wellbeing, and burnouts currently being rather common, awareness about another probably related issue is also growing: suicide. Suicide rates within the

veterinary profession, at least in the United Kingdom (England, Wales), Australia, and the USA, are reported to be alarmingly high (Tomasi et al., 2019; Mellanby, 2005; Fink-Miller et al., 2017; Thompson et al, 2017). Research suggests male and female veterinarians are 2.1 and 3.5 times more likely, respectively, to die by suicide in comparison to the general public (Tomasi et al., 2019). One of the major contributing factors is reasoned to be occupational stress (Mellanby, 2005; Fink-Miller et al., 2017; Thompson et al., 2017). Stressors most commonly indicated by veterinary professionals include “long hours, social isolation, feelings of incompetence, and mistakes during practice” (Fink-Miller et al., 2017). Another identified possible cause of the high suicide rates in the USA are the high costs of college and university education leading to high student debt and financial (di)stress (Tomasi et al., 2019). The student loans in the Netherlands are much smaller and may explain why suicide rates here appear unremarkable.

With females encompassing around 80% of the Dutch veterinary student body for the past years and females scoring higher for burnout and lower for engagement than their male colleagues, it can be expected that a ripple effect is to be seen into the wellbeing of veterinary practices in the Netherlands (Mastenbroek, 2017; Hatch et al., 2011). With more females entering practices than ever before, increasing focus on wellbeing is of utmost importance.

1.2 Competency-based Medical Education

Since the early 50’s of the last century, competency-based medical education (CBME) has been introduced into medical healthcare education and since then been embraced by many countries across the world (“the United States, Canada, the United Kingdom, Sweden, Australia, and the Netherlands”) (Chen et al., 2015). It rapidly replaced the previous system of problem-based learning as it proved to be more impactful (Ten Cate, 2005). This change was initiated by the growing gap between the traditional forms of education and the changing wishes of modern society. With changing and increasing societal demands, graduates decreasingly possessed the skills necessary to deliver the type of medicine the general public demanded, and the same holds true for the veterinary profession (Bok et al., 2011).

One of the currently applied competency-based frameworks is The Veterinary Professional (VetPro) framework. This framework is used by the Faculty of Veterinary Medicine in Utrecht, The Netherlands. It encompasses sixteen competencies, categorized into seven “domains of competence: veterinary expertise, communication, collaboration, entrepreneurship, health and welfare, scholarship, and personal development.” (Bok et al., 2011). The VetPro framework is used to longitudinally support development of students throughout their university career. Intertwined with this development is the assessment of performance of the students with a programmatic assessment approach, resulting in a combination of formative and summative assessments (Bok et al., 2018; Favier et al.,2019).

The structured longitudinal support of learning is often found to be lacking in the postgraduate workplace (Heath, 2008). The gap between the structured learning environment at university and the great responsibilities of the workplace is often a stressor for young professionals (Heath, 2008). In healthcare, workplace learning holds a large stake in the overall development of the professional (ten Cate et al., 2015). Trainees are expected to master skills through experience in the workplace (Billet et al., 2013), but until recently there was little attention for the kind of environment that supports this type of learning (ten Cate et al., 2015). Besides this, assessment of domains of competence has been criticized

and proposals for a more valid and holistic approach have been proposed. One of the proposed approaches is the concept op entrustable professional activities (EPAs) (ten Cate et al., 2005).

1.3 Entrustable Professional Activities

Competencies are rather abstract and difficult to assess. It has been suggested that entrustable professional activities (EPAs) can be used to be the link between a robust holistic assessment in the clinical workplace and the relevant competencies to be assessed (ten Cate, 2005; ten Cate, 2007; ten Cate, 2013; ten Cate et al., 2015; ten Cate et al., 2017). ten Cate first presented the concept of EPAs in 2005 (El-Haddad et al., 2015; Shorey et al., 2019; ten Cate, 2005). As stated by ten Cate, the necessity arose to further develop CBME past its theory and into a tangible aspect of practice. Without EPAs to define, implement and assess competencies, they may remain a mere label (ten Cate, 2005; ten Cate, 2013; ten Cate et al., 2017). While competencies describe a person's quality on separate domains, EPAs are the units of work that are expected to be delivered on the authentic work floor (ten Cate et al., 2015). EPAs are elements of professional practice that can be entrusted to a trainee at varying degrees of supervision once he or she has proven to be equipped with the necessary competence. While some EPAs may be small and only require a limited set of competencies, others may ask much more of the trainee (ten Cate et al., 2015 & Shorey et al., 2019). Just as a driver's license is distributed only once enough competency has been demonstrated to entrust a driver with unsupervised road access, EPAs hold a similar function in the field of (veterinary) medicine (ten Cate et al., 2017). Ultimately, the profession is comprised of units of work and is not merely a sum of personal qualities.

The conditions required to be an EPA are that it (1) is part of essential professional work in a given context, (2) must require adequate knowledge, skill, and attitude, (3) must lead to recognized output of professional labor, (4) should be confined to qualified personnel, (5) should be independently executable, (6) should be executable within a time frame, (7) should be observable and measurable in its process and outcome (well done or not well done) and (8) should reflect one or more competencies" (ten Cate et al., 2007 & ten Cate et al., 2017). An example of an EPA can be found in table 1.

Table 1 Example of an EPA for undergraduate veterinary education (adapted from AAVMA, 2018)

1) Title of the EPA	Formulate recommendations for preventive healthcare
2) Description of activity	Create a preventive healthcare plan, considering the animal/herd needs, the client's capabilities and the care setting, to optimise health and welfare, and to prevent spread of disease.
3) Commentary	Prevention of disease is a core veterinary activity that protects the health of animals and the public.

4) Most relevant domains	Individual Care & Management Animal Population Care & Management Communication
5) Secondary domains	Clinical Reasoning & Decision-making Scholarship
6) Elements within activity	- Evaluate individual animal or herd needs, considering age, health status, exposure risk - Make recommendations regarding disease screening - Educate clients and stakeholders on disease prevention measures - Perform preventive healthcare measures - Document recommendations and procedures in the record

An EPA merely shows where in a learning process the trainee is and how much autonomy and responsibility he or she has been granted based on the competencies possessed. The supervision levels of an EPA include (1) observing, (2) acting with direct supervision, (3) acting with indirect but easily available supervision, (4) acting with supervision available at a distance, and finally (5) giving supervision to junior trainees (ten Cate et al., 2015). Figure 1 shows the expanded version of these supervision levels.

Figure 1 The expanded entrustment and supervision scale* (Chen et al., 2015)

1. Not allowed to practice EPA
    a) Inadequate knowledge/skill (e.g., does not know how to preserve sterile field); not allowed to observe
    b) Adequate knowledge, some skill; allowed to observe
2. Allowed to practice EPA only under proactive, full supervision
    a) As co-activity with supervisor
    b) With supervisor in room ready to step in as needed
3. Allowed to practice EPA only under reactive/on-demand supervision
    a) With supervisor immediately available, all findings and decisions double checked
    b) With supervisor immediately available, key findings and decisions double checked
    c) With supervisor distantly available (e.g. by phone), findings and decisions promptly reviewed
4. Allowed to practice EPA unsupervised
    a) With remote monitoring (e.g. next day check-in for learner questions)
    b) Without monitoring
5. Allowed to supervise others in practicing the EPA

Next to being awarded a higher level of autonomy, trainees can be awarded a STAR (statement of awarded responsibility) for their EPAs (ten Cate et al., 2015). This is the official recognition that the trainee has reached a particular point of competency that allows them to practice the EPA at a particular level of supervision. STARs mark the transition into the profession and therefore need to hold a certain degree of notability. Hundreds of small

EPAs would lose their impact and so EPAs must be of a noteworthy size. The suggested number of EPAs to master is therefore no more than ten per year (ten Cate et al, 2015).

Entrustment decisions can be made in two ways: *ad hoc* and summative. *Ad hoc* decisions are usually a one-time entrustment to practice a specific EPA along the road of development. These decisions are made for a particular case on a particular day. Robust summative entrustment decisions result in a more formal and permanent endorsement. These decisions are based on a longer period of work (ten Cate et al., 2015).

Each trainee can combine or receive their own set of EPAs, consisting of core and non-core EPAs. With this, trainees can create their own individual curriculum based on personal interests, allowing development into one's desired professional direction. The EPAs all trainees are expected to become proficient at are the core EPAs (ten Cate et al., 2015). Non-core EPAs may accompany the core EPAs of the trainee program. For example, while every veterinarian is expected to be capable of completing a consultation, some may choose to expand their basic surgical skill set with more advanced (non-core) surgical EPAs.

EPAs are suggested as a possible solution for the young veterinary professional by supporting the transition from veterinary education to veterinary practice (Duijn et al. 2018, Favier et al. 2020).

1.4 Current use of EPAs

Since their launch in 2005, EPAs have spread and become an integral part of many healthcare institutions using CBME worldwide (Bok et al, 2018; Chen et al, 2015; El-Haddad et al, 2015; Graves et al, 2019; Jared et al, 2019; Shorey et al, 2019; ten Cate, 2013; ten Cate et al, 2017; Valentine et al, 2019). EPAs can be found integrated in undergraduate, graduate, and postgraduate programs. Over the last few years, EPAs have been welcomed into the veterinary undergraduate profession (Duijn et al., 2019; Graves et al., 2019).

Despite having spread to many countries, EPAs still remain to be an uncommon tool to be used in medical and veterinary education. Research conducted under family medicine residency program directors in the USA found that 36 out of 238 (15,1%) were currently *using* EPAs in their residency program which is a remarkably lower percentage than the 90,1% of program directors who were *aware* of the concept of EPAs (Jarret et al., 2019). This discrepancy is argued to be due to the difficulties that are met when implementing EPAs. The three main problems encountered were (1) difficulty integrating EPAs into the current assessment program, (2) the need for senior doctors to develop the EPAs and (3) insufficient time for observation of trainees (Jarret et al., 2019).

In March 2018, the Association of American Veterinary Medical Colleges (AAVMC) published a white paper, aimed at veterinary undergraduate education at universities, describing a new curricular approach with eight core EPAs showing the increased recognition of EPAs as a useful tool in veterinary medical education (AAVMC, 2018). Currently, at the Faculty of Veterinary Medicine of Utrecht University, EPAs are not in use, but will be implemented during the next curricular revision (Bok, personal communication).

1.5 Evidence based support for the use of EPAs

Ever since their launch in 2005, articles about EPAs are appearing at an increasing rate.

A study conducted amongst Australian general practitioner trainees by Valentine et al. deduced that throughout a period of a year, trainees were entrusted to work unsupervised at a steady rate as time passed. Clinically orientated EPAs that were entrusted at level 4 of supervision “increased from 26% at 3 months, to 35% at 6 months, to 50% at 9 months and 69% at 12 months.” In addition to this, senior trainees were 2.1 to 3.7 times more likely to reach level 4 of supervision by using EPAs within a year compared to junior trainees (Valentine et al., 2019). This supports the idea that EPA entrustment levels increase for trainees over time and that senior trainees’ function at higher levels compared to junior colleagues. EPAs can be used in both educational and workplace settings to track the learning progress of trainees (Valentine et al., 2019).

Bonnie et al. interviewed both trainers and trainees from the Dutch General Practitioner training program (Bonnie et al., 2019). They concluded that both groups experienced EPAs to “provide a broad, structured overview” which helped to monitor learner progress. It also helped them giving and asking for specific and concrete feedback. Some problems that were mentioned were a lack of precisely defined EPAs, and too many EPAs to complete during the training program (Bonnie et al., 2019). Similarly, Steiman et al. found that EPAs worked very well to track the learning experience and progress of surgical residents. The EPAs created an overview of trainee competence (Steiman et al., 2018).

In a recent study by Duijn et al. it was concluded that young veterinary professionals required nearly seven months of work experience on average before feeling capable of completing five tasks at EPA level 4a (Duijn et al., 2019). A task such as obtaining a blood sample and interpreting the results was only experienced to be a level 4a or 4b skill by 72,8% of graduates on their first workday. This indicates that despite graduating with full qualifications, it takes months before a comfortable level of self-experienced capability for a seemingly simple clinical task is reached by young veterinarians (Duijn et al., 2019). In the workplace, EPAs could support the continuation of professional and personal development by offering structure and mapping out clear learning objectives.

Graves et al. performed a study at the University of Tennessee, College of Veterinary Medicine, Department of Large Animal Clinical Sciences. A four-day bootcamp for all new interns based on eight core EPAs was organized. Expectation and evaluation surveys were completed by the participating interns. Ninety-five% of the interns (n=18) felt better prepared by the support of the bootcamp program. However, while the bootcamp is named the Veterinary Intern Program for EPA skills, the correct usage of EPAs is questionable. Conclusions of the effectivity of EPAs can therefore not be drawn, only speculated, from this study (Graves et al., 2019).

Previous research on EPAs is largely focused on how to successfully define them or whether they can actually be used to show progress in a professional’s career (Bonnie et al., 2019; Chen et al., 2015; El-Haddad et al., 2016; Jarret et al., 2019; Shorey et al., 2019; Steiman et al., 2018; ten Cate, 2013, ten Cate, 2005; ten Cate et al., 2007; ten Cate et al., 2017; Valentine te al., 2019). Research on whether or not trainees experience an improved transition period from student to professional and lower levels of occupational stress when supported by EPAs is still merely lacking in both human and veterinary medicine.

1.6 Aim of this study

In theory, EPAs provide a structure to longitudinally assess competencies already made aware of during CBVE. One question that comes up is whether or not veterinary students and young veterinarians might benefit from EPAs for their development. Research on this matter is lacking both in human and veterinary medicine and therefore the following research questions where formulated:

Research questions:
Are EPAs a useful medium for first opinion practice companion animal veterinarians to facilitate their transition from veterinary education into veterinary practice?

1. Do EPAs increase wellbeing (lower work-related stress, increase job fulfilment, make one feel more engaged and capable and increase satisfaction regarding the received guidance from colleagues)?
2. Do EPAs help to gain a better grip on one's professional development?

Hypothesis (for research question one):
H0 = There is significant evidence that EPAs facilitate the transition from veterinary education into veterinary practice by lowering work-related stress, increasing job fulfilment, making one feel more engaged and capable, and creating greater awareness regarding one's current competencies of first line companion animal veterinarians within the first years post-graduation.

Ha = There is no significant evidence that the EPAs facilitate the transition from veterinary education into veterinary practice by lowering work-related stress, increasing job fulfilment, making one feel more engaged and capable, and creating greater awareness regarding one's current competencies in first opinion practice companion animal veterinarians within the first years post-graduation.

Hypothesis (for research question two):
H0 = There is significant evidence that EPAs help to gain a grip on one's professional development.

Ha= There is no significant evidence that EPAs help to gain a grip on one's professional development.

2 Materials and methods

2.1 Participants

Participants were reached through the IVC Evidensia Academy in the Netherlands in collaboration with the program director. Currently, in the Netherlands there are 245 clinics within the IVC Evidensia group (Evidensia Dierenziekenhuizen en Klinieken in Nederland, 2020). The IVC Evidensia Academy is starting to provide internal guidance using EPAs for the employees of Evidensia. For the year 2019 – 2020, there are thirty-one first and fifteen second year Graduates (post-graduation veterinarians) participating in the international IVC Evidensia Academy graduate program (see appendix 1 for program information). All graduates (n=46) were invited to partake, from which 14 (30,4%; 38,7% of the first years, 13,3% of the second years) finally participated. Participants were randomly divided into a study and a control group by using block randomisation (Suresh, 2011) with seven participants.

2.1.1 Study group

This group was comprised of seven first line veterinarians (85,7% first year, 14,3% second year) working in an IVC Evidensia companion animal practice in The Netherlands. These vets were supported by EPAs during a period of three-and-a-half months. One of the seven participants dropped out of the study during the study period for unknown reasons. This participant only completed the first survey.

2.1.2 Control group

This group was comprised of seven first line veterinarians (85,7% first year, 14,3% second year) working in an IVC Evidensia companion animal practice in The Netherlands who did not receive EPA guided development. Two of the seven dropped out of the study during the study period for unknown reasons. These participants only completed the first survey.

2.2 Data collection

2.2.1 Surveys

Surveys in Dutch were distributed through the IVC Evidensia Academy using Qualtrics, the digital survey tool used by Utrecht University (UU). The survey was based on an existing survey created and used by UU to assess student wellbeing. Questions were adapted to suit the circumstances of the recently graduated veterinarians.

These electronic surveys were aimed at several aspects surrounding the transition from university to the workplace. Questions on the topics of work experience, work-related stress, job fulfilment, feeling capable at work, support from colleagues and supervisors, work-private life balance, emotional burden of work, expectations one has of themselves, one's personality, self-image and mood, behavior after a day at work and awareness regarding one's current competencies. The survey was distributed at the start of the project (T0). The T0 survey was composed of closed questions on a five, six or seven-point scale. Three-and-a-half months after the start, a second survey (T1) was performed. The T1 survey contained the same closed questions as the T0 survey, with one or seven additional open question(s) for the control and study group respectively. These extra questions were added to collect input for answering the second research question.

The open questions were developed to determine whether the young veterinarians gained confidence and a grip on their professional development since T0. And if so, how the EPAs attributed to this, if at all. The study group was also asked their views on EPAs for young veterinarians. See appendix 4 for the survey.

2.2.2 EPA scoring

Three EPAs were used to support the study group. The selected EPAs were “Performing and supervising a consultation for health check and preventive treatments”, “The work up and guidance of the dog/cat with an external otitis” and “Performing and supervising basic surgical skills”. The contents of these EPAs were formulated via an iterative process by experienced first opinion veterinarians, relevant veterinary specialists, and a veterinary medical educator (R.P. Favier) working for the IVC Evidensia group. See appendix 3 for the EPAs.

The study group was asked to assess themselves for the three EPAs twice; first as a pre-intervention measurement and second during the post-intervention measurement. For each sub-unit as described in the EPA they had to grade themselves (self-perceived levels of supervision) on a one to five scale corresponding with the levels of supervision. The control group did not do this.

2.2.3 Guidance

First and second year veterinarians participating in the IVC Evidensia graduate program have a personal clinical coach with whom they have weekly contact. This contact is set up to stimulate professional and personal development. A subset of these clinical coaches received a short explanation of EPAs, the characteristics of the study, and the guidance they may be asked to provide during a nationwide coach training day. Not all study group coaches were present at the day of training. All coaches from the study group participants received an additional instruction manual about the reason for this research and the use of the EPA concept via email. See appendix 1 for these instructions (in Dutch).

To stimulate the active use of the three EPAs, the weekly contact between study group veterinarian and coach was structured around using these EPAs with which the recently graduated veterinarians had to work with during the intervention period of three-and-a-half months. The control group also had a weekly talk with their clinical coach but did not use the EPAs to discuss their development.

An overview of data collection can be found in table 2.

Table 2 Overview and time frame of measurements and interventions for the study and control group

	Pre- intervention	**Intervention Period (three-and-a-half months)**	**Post- intervention**
Study group (n=7)	Survey and self- grading of the three EPAs.	Weekly contact with clinical coach. EPAs provided structure for the contact.	Survey and regrading of the three EPAs.

Control group (n=7)	Survey.	Weekly contact with clinical coach.	Survey.

2.2.4 Statistics

Data was analyzed using SPSS Statistics 25. The p-value used to determine significance was $p<0,05$.

2.3 Ethical considerations

All participants had to sign an informed consent. The study was approved by the Ethical Review Board of the NVMO (ERB-2019.6.9).

3 Results

3.1 Population demographics

Data regarding gender, age and work experience of all participants was collected (table 3). A total of fourteen participants were randomly divided across two equal groups of seven, forming a study and a control group.

Table 3 Population demographics: gender, age and work experience distributions of the control (n=7) and study group (n=7)

	Gender	**Age (years)**		**Work Experience (years)**	
		Median	**Range**	**Median**	**Range**
Study group	7/7 Female (100%)	28	6	1,00	1,75
Control group	5/7 Female (71,4%) 2/7 Male (28,6%)	27	6	1,50	1,75

3.2 Frequency of EPA Usage Throughout the Intervention Period

An intervention period (time between surveys T0 and T1) of three-and-a-half months was applied. This time was intended for the study group veterinarians to actively discuss, apply and think about the EPAs.

In the post-intervention survey, the study group was asked how often they used the EPAs for discussion with their coach and how often they actively worked with EPAs outside of the coaching sessions (Tables 4 and 5). Six of the seven participants answered these questions. Out of these six, all coaches and study group veterinarians discussed the EPAs at least once during the intervention period.

Table 4 Frequency study group veterinarians (n=6) discussed the EPAs with their clinical coach during the 3.5-month intervention period

Frequency of veterinarian-coach EPA discussion*		
Median	**Range**	**Mode**
4,5	2	5

**Scored from 1 (weekly), 2 (every other week), 3 (monthly), 4 (every other month), 5 (once), to 6 (not at all)*

Table 5 Frequency study group veterinarians actively discussed and/or worked with the EPAs individually during the 3.5-month intervention period

Frequency of individual EPA usage*		
Median	**Range**	**Mode(s)**
6	4	6 and 7

**Scored from 1 (daily), 2 (weekly), 3 (every other week), 4 (monthly), 5 (every other month), 6 (once), 7 (only when filling out the surveys)*

On average, a study group veterinarian was, during the intervention period, actively involved with EPAs (1) at the moment filling out of the pre- and post-intervention surveys (twice), (2) two to three times during the discussions with their coach, and (3) once without the coaches' presence resulting in a total of five or six moments.

3.3 Results of self-perceived EPA levels

Study group veterinarians were asked to score themselves for three different EPAs using the five levels of supervision one through five as previously described. For most sub-units within the three EPAs a mean level of four (permission to act unsupervised) was scored by the study group, indicating that they perceive themselves as being able to execute a skill unsupervised. Mean scores for the pre- and post-intervention measurements were compared. Table six provides a summary for these scores. See appendix five for data tables per EPA.

Table 6 Summary of (mean) changes between self-perceived EPA levels for study group veterinarians between pre- (n=7) and post-intervention (n=6) surveys

	Average change in self-perceived EPA level*	**Amount of sub-units with decreased (-) mean self-assessed level**	**Amount of sub-units with unchanged mean self-assessed level**	**Amount of sub-units with increased (+) mean self-assessed level**
EPA 1 Performing and supervising a consultation for health check and preventive treatments (24 sub-units)	+0,18	10 out of 24 (41,67%)	1 out of 24 (4,17%)	13 out of 24 (54,17%)

EPA 2 **The work up and guidance of the dog/ cat with an external otitis** **(21 sub-units)**	+0,30	5 out of 21 (23,81 %)	1 out of 21 (4,76%)	15 out of 21 (71,43%)
EPA 3 **Performing and supervising basic surgical procedures** **(15 sub-units)**	+0,07	9 out of 15 (60,00%)	0 out of 15 (0,00%)	6 out of 15 (40,00%)

**Means were derived from data on a five point scale (corresponding to the 5 levels of entrustment)*
Positive changes (+) are an increase in self-perceived level of entrustment
Negative changes (-) are a decrease in self-perceived level of entrustment

A Wilcoxon signed rank test was used to compare mean values of sub-units of self-perceived levels of supervision for the three EPAs. For most EPA sub-units no significant difference for the mean was found, except for three. The study group veterinarians assessed themselves at a higher level post-intervention (1) for the interpretation of the results of a physical examination (general physical examination and examination of the patient with a skin problem) (EPA2), (2) performing skin scrapings and being able to interpret them microscopically (EPA2) and (3) having knowledge of the most commonly used suture materials (including their composition, tissue reaction, manageability, knot security", half-life and time, and total absorption time) (EPA3).

3.4 Results regarding wellbeing

Quantitative data was gathered to answer research question one: '*Do EPAs lower work-related stress, increase job fulfilment, make one feel more engaged and capable and increase satisfaction regarding the received guidance from colleagues?'* See table seven for this data summarized per question. Individual data tables for the descriptive statistics done on survey questions one through twelve can be found in appendix six.

Table 7 Summary of changes in mean wellbeing between pre- (both groups n=7) and post-intervention (n=5 and n=6 respectively) data for Q1 through Q12 related to wellbeing for control and study group

	Average change in wellbeing (mean) per question*		**Amount of subquestions for which wellbeing improved**	
	Control	**Study**	**Control**	**Study**
Q1 **(9 subquestions)**	-0,16	-0,11	2 out of 9 (22,22%)	3 out of 9 (33,33%)
Q2 **(13 subquestions)**	+0,19	+0,01	9 out of 13 (69,23%)	5 out of 13 (38,46%)

Q3 (15 subquestions)	+0,05	+0,01	6 out of 15 (40,00%)	10 out of 15 (66,67%)
Q4 (4 subquestions)	+0,46	+0,54	4 out of 4 (100,00%)	4 out of 4 (100,00%)
Q5 (4 subquestions)	+0,26	+0,14	4 out of 4 (100,00%)	3 out of 4 (75,00%)
Q6 (8 subquestions)	-0,47	-0,20	0 out of 8 (0,00%)	3 out of 8 (37,50%)
Q7 (14 subquestions)	+0,20	+0,22	10 out of 14 (71,43%)	11 out of 14 (78,57%)
Q8 (15 subquestions)	+0,11	-0,20	5 out of 15 (26,67%)	5 out of 15 (26,67%)
Q9 (17 subquestions)	-0,11	+0,20	11 out of 17 (31,64%)	14 out of 17 (82,35%)
Q10 (9 subquestions)	+0,34	0,0	8 out of 9 (88,89%)	5 out of 9 (55,56%)
Q11 (3 subquestions)	-0,48	+0,36	0 out of 3 (0,00%)	3 out of 3 (100,00%)
Q12 (8 subquestions)	+0,08	+0,40	5 out of 8 (62,50%)	8 out of 8 (100,00%)

**Means were derived from data on a five, six or seven point scale (see appendix 3)*
Positive changes (+) represent an increase in wellbeing.
Negative changes (-) represent a decrease in wellbeing.

A Wilcoxon signed rank test was used to determine significance. See data tables in appendix six for significance (*= significance within group, **= significance between groups). For most sub questions related to wellbeing except two (Q4.1 and Q7.12), no significant difference for the mean within groups was found. The study group experienced significant increases in wellbeing when it comes to (1) meeting obligations at home (Q4.1) because one is busy at work and (2) a reduction of awareness of ones heartbeat (Q7.12) while not exercising physically (e.g. feeling a faster heartbeat or skipping of a beat). Between groups (control and study), a significant change of means was found for eight sub questions (Q1.5, 2.11, 3.4, 4.3, 4.4, 7.3, 8.3, 9.1). The study group had a more positive change in wellbeing for five (Q 2.11, 4.4, 7.3, 8.3, 9.1) of these eight sub questions compared to the study group. For the other three (Q 1.5, 3.4, 4.3), the control group saw a more positive change in wellbeing compared to the study group. See appendix 3 for subquestions.

3.5 Qualitative data: Participants views on self confidence and the use of EPAs

Research question two "*Do EPAs help gain a better grip on one's professional development?"* was answered through qualitative data collected through open questions.

3.5.1 Control group

Out of the control group five (of seven) participants answered the open question if their confidence has grown since the pre-intervention survey. All five participants answered it did. Four out of five answered that this was due to having gained knowledge and experience. Control group participant 4 (CP4) also noted that having younger colleagues seeking her advice gave her a confidence boost. CP3 found his/her confidence boosted by recognizing himself/herself to be an important team member adding value to their clinic. Parallel to the study period, the COVID-19 crisis broke out (March 2020). CP5 indicated that the COVID-19 measures resulted in a better workload.

3.5.2 Study group

Out of the study group six (of seven) participants answered the open questions. All six agreed having gained confidence, though two explicitly wrote that the gain was minimal. Three participants linked this to having gained experience and knowledge. Study group participant 3 (SP3) indicated that his/her confidence has grown because the EPAs made him/her realize that certain skills and knowledge he/she had been using since the day of graduation.

When asked if EPAs contributed to the development of their skills and knowledge, two (out of six) participants said they did not, because they forgot about them and/or used them too little to see effect. SP3 said the EPAs did not help his/her development as he/she did not apply them as he/she was already practicing veterinary medicine for almost two years. Out of the three participants who indicated that EPAs were helpful to themselves, two answered that they could have had more effect if they had used them more regularly than they already did.

All six participants thought EPAs were helpful to provide insight into what one already is doing well and areas with room for improvement. SP5 added to this question that this was *"because all subjects are divided into small steps and are in turn divided into levels of knowledge"*. SP3 stressed that it does really depend on whether a supervisor checks in on exactly how you are operating for example, otherwise one could end up executing the skill wrong for years without knowing so.

When asked if EPAs are a useful tool to support recently graduated veterinarians, four out of five agreed. Participants noted that *"it is important to keep tracking my progress"* (SP6) and that EPAs *"show in a very structured way what you (should) be able to perform per subject. Due to the structure and division into levels, you can see exactly which step you are missing and/or can improve"* (SP5). One of the participants that agreed answered that while being a good tool, it is not realistic in all clinics because *"you are often alone"* (SP3).

Five (out of six) participants indicated that they would recommend practices with recently graduated veterinarians to use EPAs. They are a *"good way to test the young vet's level per subject. Provides insight into what to improve and because of the structure you can easily ask help from colleagues about exactly what can be improved. It is also good to discuss these with colleagues, so that each of them knows where that person is on certain topics with clear insight into your strengths and points for improvement"* (SP5). SP2 mentioned that it is important to have a supportive supervisor for this, as *"well-meant advice can sometimes make someone less confident if told in an unfriendly manner" (*SP 2*).* SP3 indicated that EPAs are only a good addition in the first months post-graduation because he/she believes level 4 is reached quickly.

4 Discussion

4.1 Summary of results for research question one

The hypothesis of the first research question: *There is significant evidence that EPAs facilitate the transition from veterinary education into veterinary practice by lowering work-related stress, increasing job fulfilment, making one feel more engaged and capable, and creating greater awareness regarding one's current competencies of first line companion animal veterinarians within the first years post-graduation* was partially shown to be true.

The quantitative data supports the idea that the use of EPAs has a positive impact on the wellbeing of recently graduated veterinarians within the first years in private practice. The study group experienced significantly less symptoms of anxiety and a better work-private life balance while the control group did not experience any significant changes. These changes were only significant within, not between, groups

Since no previous research has been done on the effect EPAs have on stress and/or wellbeing of recently graduated veterinarians, these findings cannot be compared to previously found data within the veterinary profession. Valentine et al. studied the number of EPAs entrusted at level four in junior general practitioners in human medicine. This increased from 26% after 3 months to 35% after 6 months of using EPAs. A three-month period showed a 9% increase of EPAs entrusted at level four. A positive change in wellbeing is hypothesized to be seen as a result of EPAs helping to gain a grip on one's professional development and an increase in the EPA entrustment levels as seen by Valentine et al. Smaller increases in assessed EPA levels were seen in this study compared to the study by Valentine et al. With small steps in professional growth, small positive effects on wellbeing are expected. These were observed in this study.

Similarly, Duijn et al. found that nearly seven months of work experience was needed on average before feeling capable of completing five tasks at EPA level 4a (Duijn et al., 2019). The average work experience in years of the study group was one year, and indeed the average self-perceived EPA level was four. The last step from level four to five is not be expected to be made in merely three-and-a-half months, so changes in wellbeing of a similar smaller magnitude were also to be expected based on Duijn et al.

A decrease in work-related stress was experienced by the study group. This was more specifically seen in decreased symptoms of anxiety such as being less aware of ones heartbeat while not exercising physically (e.g. feeling a faster heartbeat or skipping of a beat).

A decrease in work-related stress in the study group was also seen through a reduction of having difficulties to schedule and perform (private) obligations at home. This positive change might be explained by different factors. The study group participants could have increased their work efficiency more compared to the control group, or they experienced their situation differently. Work-related stress attributes to the idea that one has less time and/or space for obligations at home. Nevertheless, the study group developed a more balanced work-private life.

Although, the remaining (sub)question data (summarized in data table six) was not found to be significant, it still hints towards a more positive change in the study group. More and

larger positive wellbeing changes were seen in the study group compared to the control group. As Valentine et al. showed, more time working with EPAs will create bigger increases in EPA entrustment levels that can be related to more positive changes in wellbeing.

4.2 Summary of results for research question two

The positive quantitative changes in wellbeing in the study group were affirmed by the qualitative data collected to answer the second research question. EPAs were well-received by the study group participants. Even if the participants experienced little effect due to inadequate use, the participants unanimously believed that EPAs are a useful tool to help young colleagues to gain a better grip on one's professional development. Similar findings by Graves et al. showed that 95% of veterinary interns felt better prepared by the support of an EPA program (Graves et al., 2019). Participants indicated that EPAs provided a clear and appreciated structure. These results are in line with previous findings by Bonnie et al., Steiman et al. and Duijn et al. Clinics with newly graduates veterinarians were encouraged by the young veterinarians to use EPAs to support development, another finding that matched with findings by Graves et al.

Despite these positive results, this research project also has some limitations.

4.3 Limitations

First, the post-intervention survey was distributed on April 14th 2020 amidst the nationwide COVID-19 lockdown and potential repercussions on mental health can be expected. Potentially the expected negative effects of the COVID-19 crisis on wellbeing also affected the participants and thereby the results, leading to less (significant) improvement seen in both groups. Participants were not asked if and how COVID-19 may have affected their quantitative scores.

Perfectionism and/or high demands for oneself (see supplemental tables 25 and 26; questions 8.1-9) are traits that negatively affect wellbeing. While the control group experienced a positive effect on wellbeing for five out of the nine sub questions, the study group sees more negative effects (eight out of nine). Potentially, depending on the perfectionist traits of the individual, EPAs can be confrontational for some veterinarians, showing all the skills and knowledge that they do not yet master. One can only speculate however, as this data was not significant.

Despite planned otherwise, the number of times a study group veterinarian actively worked with EPAs came to an average of five or six times in the intervention period of three-and-a-half months resulting in an occupation with EPAs about every two-and-a-half weeks. None of the veterinarians achieved the frequency of the aimed weekly discussion. It can be argued that the mean frequency of usage, and the frequency of usage by some participants, was too low to create the envisioned effect on wellbeing. As mentioned by several participants, more positive results could have been seen with more frequent usage of EPAs. One participant in particular stressed the importance of having a good supervisor by whom EPAs are entrusted and supervised.

An intervention period of only three-and-a-half months was feasible due to time constraints. This intervention period may have been too short to see full effect of the EPAs.

With a limited sample size (fourteen subjects in total) the validity of the data should be interpreted cautiously. The sample also limits the analysis of the quantitative data to descriptive statistics.

The dropping out of three participants during the study further decreased the group size, and may have had effects on the processed data; the minor but significant changes in mean found between the two surveys could among other things could be explained by the missing data of these participants.

The remaining thirty-two approached veterinarians who did not respond and/or did not want to take part for unknown reasons may have done so because of time related issues due to a heavy workload. Professionals experiencing heavy workloads may not be keen filling out surveys. The nature of the research methods may have selected young veterinarians who are (already) doing above average and experiencing higher levels of wellbeing when compared to their professional peers.

4.4 Further research

Due to the positive results despite small sample groups, further research using a larger representation of the newly graduated Dutch veterinarian population into the application of EPAs during the phase of transition from education to the veterinary practice is warranted.

4.5 Practical implications

Based on the results of this study, EPAs can be implemented by veterinary practices across the Netherlands as they have been proven to have a positive impact on the wellbeing of the young veterinarian in transition. In addition to this these newly graduated veterinarians experience positive changes on work related stress and by getting grip on one's professional development by using EPAs for self-assessment. Combined with the use of EPAs the active role of a coach is of importance.

4.6 Conclusion

The study found quantitative and qualitative data that supported both research hypotheses. No data disproved the hypotheses. EPAs are a tool that are welcomed by veterinarians in the first years of their career as companion animal practitioner in the Netherlands. Small positive changes in wellbeing were found by the study group. It is suggested that spending more time on EPAs will increase this effect as they are said to provide structure that allows tracking of one's current skills and incremental steps towards improvement. EPAs can help gain grip on one's professional development.

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Appendix

Appendix 1: Instruction manual for the coaches (in Dutch)

Handleiding Vaardigheidsbewijzen bij het project:

Inzet van Vaardigheidsbewijzen ter ondersteuning van de overgang van student naar startende veterinaire professional

Wat zijn vaardigheidsbewijzen?
Om het leren op de werkplek gericht te ondersteunen wordt er binnen medische (vervolg)opleidingen sinds een 10-tal jaren gewerkt met **vaardigheidsbewijzen** (in de literatuur ook wel Entrustable Professional Activities (EPAs) genoemd). Deze vaardigheidsbewijzen geven een realistisch en authentiek beeld van de vaardigheden die een (dieren)arts op een bepaald moment in haar/zijn ontwikkeling zou moeten bezitten om met een bepaalde mate van zelfstandigheid aan het werk te kunnen gaan. Als de lerende, bijvoorbeeld een pasafgestudeerde dierenarts, een voldoende niveau heeft laten zien kan dit worden uitgedrukt in de mate van zelfstandigheid waarmee deze dierenarts vervolgens kan handelen.

De te onderscheiden niveaus van (mate van) supervisie zijn:
- Niveau 1: Aanwezig zijn en observeren
- Niveau 2: Handelen met directe, proactieve supervisie (supervisor is fysiek aanwezig op de werkplaats)
- Niveau 3: Handelen met indirecte, reactieve supervisie (supervisie op afstand, supervisor is wel direct beschikbaar indien nodig)
- Niveau 4: Zelfstandig handelen zonder beschikbaarheid van supervisie
- Niveau 5: Supervisie kunnen bieden aan collega's uit lagere niveaus

Waarom gebruiken we vaardigheidsbewijzen?
Veel pasafgestudeerde dierenartsen ervaren de overgang van de studie naar de praktijk als zwaar. Er wordt gesproken over een zogenaamde kloof tussen de vaardigheden die ontwikkeld zijn tijdens de studie en die nodig zijn in de praktijk. Dit kan bijdragen aan een toename van werkgerelateerde stress. Het idee is dat door samen met een begeleider/supervisor gebruik te maken van vaardigheidsbewijzen, pasafgestudeerde dierenartsen gericht en stapsgewijs meer verantwoordelijkheden krijgen zodat de ontwikkeling als dierenarts in de praktijk in de eerste jaren na het afstuderen op een meer gecontroleerde en minder stressvolle manier plaatsvindt. Echter, concrete onderbouwing of deze manier van ondersteuning van de overgang van de opleiding naar het werkveld effectief is, ontbreekt nog.

Voor wie zijn de vaardigheidsbewijzen?
Momenteel worden vaardigheidsbewijzen ingezet bij kleine groepen meer ervaren dierenartsen binnen de verschillende differentiatietrajecten. Evidensia wil dit echter graag gaan uitbreiden bij de eerste- en tweedejaars dierenartsen die in hun overgangsfase van de studie naar het werkveld zitten.

Opzet en uitvoering van het onderzoeksproject.

Aangezien vrijwel alle bij Evidensia werkende jonge dierenartsen deelnemen aan de Graduate Course (Graduates, 1e of 2e jaar) is er voor gekozen om bij deze groep een aantal vaardigheidsbewijzen in te zetten. Voor aanvang zal er aan alle deelnemende Graduates gevraagd worden om een toestemmingsformulier in te vullen. De deelnemers zullen gerandomiseerd in 2 groepen worden verdeeld: (1) groep MET inzet van vaardigheidsbewijzen en (2) groep ZONDER inzet van vaardigheidsbewijzen (zie de drie vaardigheidsbewijzen hieronder).

De Graduates in de groep MET inzet van de drie vaardigheidsbewijzen zullen hier zelf mee aan de slag gaan en hun ervaringen en voortgang bespreken tijdens de contactmomenten tussen coach en Graduate.
Bij aanvang in december 2019 zullen alle deelnemende Graduates via een digitale Survey een vragenlijst invullen over aspecten gerelateerd aan hun overgang van student naar dierenarts in de praktijk. Denk hierbij aan vragen over onderwerpen gerelateerd aan stress, (on)zekerheid, (in)competent voelen en plezier op de werkvloer.

De Graduate groep MET inzet van de vaardigheidsbewijzen zal ook gevraagd worden om zichzelf te scoren (self grading) m.b.t. de supervisieniveaus (N1 t/m N5) voor alle onderdelen zoals die in de drie vaardigheidsbewijzen zijn benoemd. Tijdens de diverse contactmoment met de clinical coach zal er aandacht worden besteed aan de ontwikkeling van de beoogde kennis en vaardigheden zoals die beschreven zijn in de drie vaardigheidsbewijzen.

De Graduate groep ZONDER inzet van de vaardigheidsbewijzen gaan zich niet bezighouden met de 3 vaardigheidsbewijzen en dus ook niet gebruiken tijdens de gesprekken met de clinical coach als richtlijnen.

De Rol van de Coach

Tijdens de wekelijkse contacten tussen Graduate en coach zal er aandacht worden besteed aan de drie vaardigheidsbewijzen. De Graduate en coach worden niet verwacht wekelijks de competenties te scoren. Wel kan de coach de Graduate aansturen tot nadenken over hun ontwikkeling door middel van vragen over (het gebruik van) de vaardigheidsbewijzen.

Denk aan vragen zoals:

- Is er deze week iets veranderd in je competenties genoemd in de vaardigheidsbewijzen? Zo ja, wat is er veranderd en hoe is dat zo gekomen?
- Is er een onderdeel van een vaardigheidsbewijs waar je de komende tijd aan wilt werken?
- Zijn er onderdelen die je wilt ontwikkelen of onderdelen waarover je nu tevreden bent?
- Hoe zou je ervoor kunnen zorgen dat je voor dit onderdeel op een hoger niveau gaat functioneren?
- Wat kan het vaardigheidsbewijs toevoegen aan jouw professionele ontwikkeling?
- Heb je nog nagedacht over de vaardigheidsbewijzen?

Appendix 2: The three EPAs used for the intervention of the study group (in Dutch)

No TBC	*Titel EPA*	**Het uitvoeren en begeleiden van een consult voor gezondheidscontrole en preventieve behandelingen**	**Mate van toevertrouwen[1]**
Beschrijving *(specificatie en beperking)*		Het doel van deze EPA is een set van kennis en vaardigheden te ontwikkelen die erop gericht zijn om zelfstandig bij een hond of een kat door een anamnese, een algemeen lichamelijk onderzoek en eventueel aanvullend onderzoek, de klant te kunnen adviseren over risico's en te nemen preventieve maatregelen op het gebied van: - Infectieuze aandoeningen (en bijbehorende vaccinaties) in binnen- en buitenland. - Ecto- en endoparasieten bestrijding (preventief en therapeutisch) - Voeding - Gebitsverzorging - Ontwikkeling van het jonge dier - Castratie/sterilisatie (neutralisatie) - Geriatrische aandoeningen zoals artrose en hypertensie - Gedrag - Mogelijkheden mbt Zorgplan en dierverzekering Dit om de kwaliteit van leven te waarborgen en de levensverwachting te verlengen/optimaliseren. De risico's en aanwezige problemen dienen vastgesteld te worden, waarna er een advies en mogelijk een stappenplan aan de eigenaar gegeven wordt. Deze informatie dient in begrijpelijke taal met de eigenaar gecommuniceerd te kunnen worden.	
Frequentie van voorkomen		Zeer frequent (dagelijks)	
Belangrijkste competenties		- Communicatieve vaardigheden - Samenwerken - Gezondheid en welzijn - Veterinair handelen - Plannen en organiseren	

Kennis & vaardigheden	- Het vaardig en gestructureerd kunnen uitvoeren van een clientgesprek, waarin de verschillende gespreksfasen (7 of 8 stappen, afhankelijk van UK of NL-model) bewust worden doorlopen. - Gezondheidscontrole: anamnese en lichamelijk onderzoek met betrekking tot punten genoemd in de beschrijving. - Ook zonder hulpvraag van de eigenaar een gedetailleerd gesprek kunnen voeren met betrekking tot deze punten. - Een probleemlijst kunnen opstellen, indien aan de orde, en de situatie van het dier en eigenaar kort en bondig kunnen samenvatten. - I.g.v. afwijkingen een differentiele diagnose kunnen opstellen en de indicatie voorverder onderzoek kunnen stellen. - Het nut van onderzoek zonder ogenschijnlijk probleem kunnen toelichten (o.a. geriatrische screening). - Aanvullend onderzoek (o.a. urine- en bloedonderzoek, bloeddrukmering) kunnen verrichten. - Kennis hebben van infectieuze aandoeningen in Nederland en het buitenland. - Kennis van en inzicht hebben in de fysiologie van het immuunsysteem en preventie van infectieuze aandoeningen d.m.v. vaccinatie. - Op de hoogte zijn van de actuele vaccinatierichtlijnen en het correcte gebruik van titerbepalingen. Vaccinaties en eventuele titerbepalingen lege artis voorbereiden (in samenwerking met de paraveterinaire ondersteuning) en uitvoeren. - Kennis van en inzicht hebben in de preventie van endo- en ectoparasieten en de beschikbare middelen in de praktijk. - De voedingstoestand (Body Condition score (BCS)) van het dier kunnen bepalen – samen met de eigenaar (uitleg). - Kennis en inzicht betreffende de oorzaken, symptomen en behandeling van een afwijkend gewicht.	

	- Kennis van en inzicht hebben in de juiste onderhouds- en dieetvoedingen voor gezelschapsdieren. - Kennis van en inzicht hebben in de preventie van gebitsaandoeningen bij hond en kat en deze aandoeningen herkennen bij lichamelijk onderzoek. - Kennis van en inzicht hebben in veel voorkomende geriatrische aandoeningen bij hond en kat, met bijbehorende symptomen, diagnostiek en behandeling. - Kennis van en inzicht hebben in de ontwikkeling van jonge dieren en de bijbehorende adviezen m.b.t. preventieve zorg, socialisatiefasen en (dierenarts)training. - Eigenaren kunnen voorlichten over de mogelijkhheden, voor- en nadelen mbt castreren/steriliseren. - Op een veilige en zo diervriendelijk mogelijke wijze onderzoeken en behandelen van gezelschapsdieren en de eigenaar kunnen adviseren over vervoer naar en de omgang met het dier in de kliniek. - Eigenaren kunnen voorlichten over mogelijkheden m.b.t. Zorgplan en dierverzekering. - Met de eigenaar in begrijpelijke taal kunnen communiceren en duidelijke adviezen kunnen geven omtrent preventieve zorg zoals vaccinatie, antiparasitica en voeding. - Het herkennen van en succesvol om kunnen gaan met barrieres, bezwaren of emoties van klanten. - Bevindingen en gemaakte afspraken in het patientenmanagement (Animana) kunnen vastleggen en, indien van toepassing, schriftelijk delen met de eigenaar. - Indicatie voor follow-up vaststellen en dit met de eigenaar vastleggen (indien aan de orde).	

Beoordeling (mate van toev-ertrouwen)	Voor de EPA beoordeling: 1. door **cursusleiders** op basis van onderlinge vraaggesprekken en observaties tijdens de onderwijsmomenten (modules – op een longitudinale manier). **2.** Praktijkbeoordelingen – (oa. a.d.h.v. eigen patiënten op de eigen werkplek) door **eigen supervisor** 3. Kennistoetsing adv mondelinge vragen tijdens de onderwijsmomenten **(door cursusleider).** Cursusleider en de eigen supervisor treden onderling in overleg om samen tot een oordeel te komen waar de kandidaat zich op dat moment in zijn/haar ontwikkeling bevindt en op welk niveau de EPA wordt toevertrouwd. Op basis van dit oordeel kan ook worden vastgesteld waar de kandidaat zich wellicht verder zou kunnen ontwikkelen.	

No TBC	*Titel EPA*	**Het opwerken en begeleiden van de hond/ kat met een otitis externa.**	**Mate van toevertrouwen[1]**
Beschrijving *(specificatie en beperking)*		Het doel van deze EPA is een set van kennis en vaardigheden die erop gericht zijn om zelfstandig bij een hond of een kat met otitis externa na anamnese, algemeen en dermatologisch lichamelijk onderzoek incl. otoscopie, de indicatie voor aanvullend onderzoek (huidafkrabsels, cytologie, microbiële kweken, bloedonderzoek, allergologisch onderzoek (eliminatiedieet, allergietesten) en histopathologisch onderzoek te kunnen stellen, om tot een oorzaak van de otitis externa te komen. De gevonden afwijkingen dienen te kunnen worden geïnterpreteerd en te worden teruggekoppeld met de gevonden afwijkingen tijdens het lichamelijk en aanvullend onderzoek. Na het stellen van de diagnose moet er een passend therapieplan inclusief follow-up kunnen worden opgesteld en dient er aangegeven te kunnen worden wat de prognose is. Deze informatie dient op een duidelijke manier aan collegae en in begrijpelijke taal met de eigenaar gecommuniceerd te kunnen worden. Het behandelplan dient uitgevoerd te worden en opgevolgd te worden waar heldere afspraken met de eigenaar over gemaakt dienen te worden.	
Frequentie van voorkomen		Frequent	
Belangrijkste competenties		- Veterinair handelen - Communicatieve vaardigheden - Samenwerken - Gezondheid en welzijn - Plannen en organiseren	

Kennis & vaardigheden	- Afname anamnese en lichamelijk onderzoek, met speciale aandachtspunten hierbij voor de hond of kat met otitis externa. - Kennis omtrent anatomie en fysiologie van het oor (externa, media, interna), de huid en het immuunsysteem van de hond en de kat. - Het verschil kennen tussen voedselintolerantie en voedselallergie. - Pathofysiologie van immuungemedieerde en infectieuze huidaandoeningen kennen en kunnen uitleggen aan collegae. - Kennis en inzicht van oorzaken van otitis externa bij de hond en de kat hebben; een differentiële diagnose (DDx) kunnen opstellen en daarbij vooruitlopend op een aanvullend onderzoek de volgorde in de DDx kunnen prioriteren. - Interpreteren van de uitkomst van het lichamelijk onderzoek (algemeen lichamelijk onderzoek, huid). - Kennis, begrip en inzicht rondom opstellen van een diagnostisch plan in een logische volgorde m.b.t. de hond en kat met otitis externa. - Aanvragen en interpreteren van aanvullend bloedonderzoek, indien geïndiceerd. - Verrichten van huidafkrabsels en deze microscopisch kunnen interpreteren. - Otoscopisch onderzoek kunnen verrichten - Oren kunnen spoelen - Verrichten van cytologisch onderzoek van afwijking in / op de huid (epidermaal, dermaal, subdermaal) - Correct bemonsteren van de gehoorgang voor BO/ABG - Indicatie voor video-otoscopisch onderzoek kunnen stellen. - Indicatie voor verdere diagnostiek met beeldvorming (video-otoscopie/ CT) kunnen stellen	- A - B1 - B2 - C/D

	- Indicatie voor het nemen van histologische huidbiopten kunnen geven en uitvoeren. - Uitvoerig video-otoscopisch onderzoek kunnen uitvoeren incl. het uitvoeren van myringotomie en het spoelen van het middenoor - Kunnen interpreteren van een histologisch rapport welke door een patholoog is opgesteld.* - Therapieplan opstellen en prognose bepalen en deze aan collegae en in begrijpelijke termen aan de patiënteigenaar kunnen overdragen. - Uitvoeren van het therapieplan. - Indicatie voor follow-up vaststellen en dit met de eigenaar vastleggen.	- C/D - C+/D
Beoordeling (mate van toevertrouwen)	Voor de EPA beoordeling: 1. door **cursusleider** op basis onderlinge vraaggesprekken en observatie tijdens de onderwijsmomenten (modules – op een longitudinale manier). **2.** Praktijkbeoordeling – (oa. a.d.h.v. eigen patiënten op de eigen werkplek) door **eigen supervisor** 3. Kennistoetsing adv mondelinge/schriftelijke vragen tijdens de cursus **(door cursusleider).** Cursusleider en de eigen supervisor treden onderling in overleg om samen tot een oordeel te komen waar de kandidaat zich op dat moment in zijn/haar ontwikkeling bevindt en op welk niveau de EPA wordt toevertrouwd. Op basis van dit oordeel kan ook worden vastgesteld waar de kandidaat zich wellicht verder zou kunnen ontwikkelen.	

* Verdiepende zelfstandige interpretatie van histologie is geen primair onderdeel van deze EPA, is wel benodigd, maar in teamverband (DIT is nl. niveau D)

No. 4.1	*Titel EPA*	**Uitvoeren en begeleiden van de basis chirurgische handelingen**	**Mate van toevertrouwen[1]**
Beschrijving *(specificatie en beperking)*		Het doel van deze EPA is een set van kennis en vaardigheden te ontwikkelen die erop gericht zijn om zelfstandig bij een hond of een kat een basis chirurgische handeling uit te kunnen uitvoeren. Deze kennis en vaardigheden omvatten de volgende aspecten: • Correcte voorbereiding van de patiënt voor de chirurgsche ingreep • Correcte hand desinfectie van de chirurg • het correcte gebruikt van peri-operatieve antibiotica • het kunnen selecteren en correct toepassen van hechtmateriaal en hechtpatroon • een goede kennis hebben van de verschillende chirurgische instrumenten (gebruik en limitaties). • Het correct kunnen maken en sluiten van een chirurgische incisie (“lege artis”) de directe nazorg na afronden van de operatie	
Frequentie van voorkomen		Frequent	
Belangrijkste competenties		- Veterinair handelen - Plannen en organiseren - Communiceren	

Kennis & vaardigheden	- Correct uitvoeren van pre-chirurgische hand preparatie mbv “alcohol-based hand rub method”
	- Correct aandoen van een chirurgische schort
	- Correct aandoen van chirurgische hand-schoenen volgens het principe van “closed or open gloving”
	- Kennis hebben van de meest courant gebruik-te hechtmaterialen inclusief
	  ○ hun compositie
	  ○ weefsel reactie
	  ○ handelbaarheid
	  ○ “knot security”
	  ○ halfwaarde tijd en
	  ○ totale absorptie tijd
	- Kennis hebben van de voor en nadelen van monofilament versus multifilament hecht materiaal
	- Het correct kunnen selecteren van een hechtmateriaal voor de chirurgische ingreep
	- Kennis hebben van de verschillende soorten hecht naalden en correct kunnen selecteren van een correcte hechtnaald op basis van het weefsel en chirurgische ingreep
	- Kennis hebben van de verschillende hechtpa-tronen inclusief:
	  ○ “simple interrupted”
	  ○ “Simple continuous”
	  ○ Horizontal mattress
	  ○ Vertical matress
	  ○ Modified Gambee suture
	  ○ Lembert hechting
	  ○ Cushing hechting
	- Correct selecteren van een hechtpatroon op basis van de chirurgische ingreep en weefsel
	- Het correct kunnen maken en sluiten van een chirurgische incisie “lege artis” .
	- Het correct kunnen aanbrengen van een chirurgische knoop mbv een naaldvoerder en met de hand (“one-handed & two-handed)
	- Het correct kunnen ligeren van een bloedvat mbv de volgende technieken: eenvoudige ligatuur, transfixatie ligatie
	- Het correct kunnen aanbrengen van een tabakshechting (purse string suture)
	- Het correct kunnen beveiligen van een drain mbv een “finger trap suture”
	- Een postoperatief plan kunnen opstellen na de operatie en dit effectief kunnen commu-niceren met het nazorg team en de eige-naar.	

Beoordeling (mate van toev-ertrouwen)	Voor de EPA beoordeling: 1. door **cursusleider** op basis onderlinge vraaggesprekken en observatie tijdens de onderwijsmomenten (modules – op een longitudinale manier). 2. Praktijkbeoordeling – (oa. a.d.h.v. eigen patiënten op de eigen werkplek) door **eigen supervisor** 3. Kennistoetsing adv mondelinge vragen tijdens de cursus **(door cursusleider).** Cursusleider en de eigen supervisor treden onderling in overleg om samen tot een oordeel te komen waar de kandidaat zich op dat moment in zijn/haar ontwikkeling bevindt en op welk niveau de EPA wordt toevertrouwd. Op basis van dit oordeel kan ook worden vastgesteld waar de kandidaat zich wellicht verder zou kunnen ontwikkelen.	

Te onderscheiden niveaus voor wat betreft het vertrouwen in de capaciteiten van de dierenarts (lerende):

Niveau 1: Aanwezig zijn en observeren
Niveau 2: Handelen met directe, proactieve supervisie (supervisor is fysiek aanwezig op de werkplaats)
Niveau 3: Handelen met indirecte, reactieve supervisie (supervisie op afstand, supervisor is wel direct beschikbaar indien nodig
Niveau 4: Zelfstandig handelen zonder beschikbaarheid van supervisie, met rapportage achteraf
Niveau 5: Supervisie kunnen bieden aan collega's uit lagere niveaus

Evidensia methodiek / toevoeging:
Te onderscheiden niveaus (*mate van differentiatie*) voor wat betreft de mate van ontwikkeling van de dierenarts (de lerende):

A: Een beginnend dierenarts
B1: De gevorderde 1e lijns dierenarts
B2: Expert 1e lijns dierenarts, met eventueel competenties op differentiatie niveau
C: Afgerond gedifferentieerd dierenarts
D: Specialist / Diplomate

Appendix 3: The surveys

This survey was executed in Dutch by the veterinarians and translated into English.

Questions in both first (pre) and second (post) surveys:

Question 1: scored 1 through 7 (never, once per year, once per month, few times a month, once per week, few times a week, every day)
The next questions are about how you experience your work and how you feel about that. Assess how often the statements below apply to you.
Q1.1 When I am working I am full of energy.
Q1.2 I find my work useful and meaningful
Q1.3 When I am working, time flies by.
Q1.4 I feel strong and fit when I am working
Q1.5 I forget everything around me when I am working.
Q1.6 My work inspires me.
Q1.7 When I get up in the morning I am excited to go to work.
Q1.8 I am proud to be doing this kind of work.
Q1.9 I am completely absorbed by my work.

Question 2: Scored 1 through 5 (never, sometimes, regularly, often, always).
The next questions are about how you experience your work and how you feel about that. Assess how often the statements below apply to you.
Q2.1 Because of my work I feel mentally exhausted.
Q2.1 I don't get rested after I work.
Q2.3 I want to be active for my work, but I don't manage.
Q2.4 When I make an effort for my job, I get tired quickly.
Q2.5 I cannot generate interest and enthusiasm for my work.
Q2.6 I feel a strong aversion to my work.
Q2.7 I am cynical about my work.
Q2.8 I find that I have no control over my emotions.
Q2.9 I get angry or sad without knowing why.
Q2.10 I can react too strongly emotionally when I didn't mean to.
Q2.11 It is difficult to hold my attention while working.
Q2.12 While working, I have trouble thinking clearly.
Q2.13 I make mistakes while working because my head is "not fully there."

Question 3: Scored 1 through 5 (never, sometimes, regularly, often, always).
The next questions are about how you experience your work and how you feel about that. Assess how often the statements below apply to you.
Q3.1 Do you have to work very quickly?
Q3.2 Do you have to do a lot of work?
Q3.3 Do you work extra hard to get things done?
Q3.4 Do you have to work under high time pressure?
Q3.5 Do you have enough time to finish your work?
Q3.6 Do you know exactly what is expected of you at work?
Q3.7 Is it completely clear to you what you are and are not responsible for?
Q3.8 Do you know exactly what your supervisor / boss expects of you?
Q3.9 Is it completely clear to you what exactly your duties are?
Q3.10 I can develop myself sufficiently within my work.
Q3.11 My work offers me the opportunity to learn new things.
Q3.12 In my work I have the space to develop my strengths.

Q3.13 Does your work offer you sufficient opportunities to find out how well you perform?
Q3.14 Do you receive information about your performance from your supervisor / boss?
Q3.15 Do you get information from your colleagues about how well you are performing your work?

Question 4: Scored 1 through 5 (never, sometimes, regularly, often, always).
The next questions are about how you experience your work and how you feel about that.
Assess how often the statements below apply to you.
Q4.1 How often does it occur that it is difficult for you to meet your obligations at home because you are always busy with work?
Q4.2 How often do you have to change or cancel agreements with your partner / family / friends due to obligations at work?
Q4.3 How often does it happen that you have to do so much work that you do not have time for your hobbies?
Q4.4 How often does your work take up time that you would rather spend on your partner / family / friends?

Question 5: scored 1 through 4 (never, sometimes, often, always)
The following questions are about the burden your work puts on you. For each question, always enter the answer that applies to your situation.
Q5.1 Is your work emotionally demanding?
Q5.2 At your work, are you confronted with things that touch you personally?
Q5.3 Do you end up in heavy situations due to your work?
Q5.4 Do you end up in emotionally charged situations because of your job?

Question 6: Scored 1 through 5 (never, sometimes, regularly, often, always).
The next questions are about how you experience your work and how you feel about that.
Assess how often the statements below apply to you.
Q6.1 My colleagues pay attention to my feelings and problems.
Q6.2 My colleagues show that they appreciate the way I do my work.
Q6.3 If necessary, colleagues help me with a certain task.
Q6.4 If necessary, my colleagues give me advice on how to tackle something.
Q6.5 My supervisor / boss pays attention to my feelings and problems.
Q6.6 My supervisor / boss shows that he appreciates the way I do my work.
Q6.7 If necessary, my supervisor / boss helps me with a certain task.
Q6.8 If necessary, my supervisor / boss will advise me on how to tackle something.

Question 7: scored 1 through 4 (not at all / never, little / sometimes, quite / often, very definitely / usually)
The following questions are about your well-being from the past week. There are no right or wrong answers. Don't spend too much time on every statement, it's about your first impression. To what extent did the statements below apply to you in the past week?
Q7.1 I noticed that my mouth was feeling dry.
Q7.2 I was not able to experience any positive feeling.
Q7.3 I had trouble breathing (e.g. breathing excessively fast, being out of breath without straining).
Q7.4 I found it difficult to take the initiative to do something.
Q7.5 I noticed that I was shaking (e.g. with my hands).
Q7.6 I was concerned about situations in which I could panic and ridicule myself.
Q7.7 I felt like I had nothing to look forward to.
Q7.8 I felt gloomy and melancholy.
Q7.9 I felt like I almost panicked.
Q7.10 I was unable to get excited about anything.
Q7.11 I felt that as a person that I am not much.
Q7.12 I was aware of my heartbeat while not exercising physically (e.g. feeling a faster heartbeat or skipping of a beat).
Q7.13 I was anxious for no reason.

Q7.14 I felt that my life was of no use.

Question 8: scored 1 through 5 (totally disagree, disagree, neutral, agree, totally agree)
The following questions are about your way of thinking in your work. To what extent do you currently disagree with each of the following statements?
Q8.1 To feel valuable, I have to be very good at the work I do.
Q8.2 I have to perform well at work to be satisfied with myself.
Q8.3 I believe I have to do my job perfectly.
Q8.4 I must be the best at my job.
Q8.5 I am not allowed to make mistakes at work.
Q8.6 If I do something wrong in my work it has disastrous consequences.
Q8.7 If I don't get my job done on time, it's a disaster.
Q8.8 It is terrible if I don't function properly at work.
Q8.9 It is terrible when things go wrong at work.
Q8.10 It is terrible to forget a work-related appointment.
Q8.11 I can't stand it when I encounter uncertainties in my work.
Q8.12 I can only handle work situations well when they are predictable.
Q8.13 I am able to deal with unexpected events in my work.
Q8.14 I cannot tolerate taking risks at work.
Q8.15 I cannot deal with uncertainties in my work.

Question 9: scored 1 through 6 (strongly disagree, disagree, slightly disagree, slightly agree, agree, strongly agree)
A few questions now follow about how you view your work at the moment. To what extent do you currently (dis)agree with the following statements?
Q9.1 I assume a good outcome, even when things are uncertain in my work.
Q9.2 If something can go wrong in my work, then it will go wrong.
Q9.3 I always look at my work from the bright side.
Q9.4 I am optimistic about my future in the professional field.
Q9.5 Things at work never go the way I would like.
Q9.6 My motto at work is: the sun shines behind the clouds.
Q9.7 If there are difficult problems at my work, I know how to solve them.
Q9.8 I achieve my goal at work, even when unexpected situations arise.
Q9.9 When I come across obstacles at work, I always find a way around them.
Q9.10 Even though it costs me a lot of time and energy, I achieve what I want at work.
Q9.11 If something new happens to me at work, I always know how to deal with it.
Q9.12 If I have a setback in my work, I have a hard time getting back up and moving on.
Q9.13 Normally I can handle difficulties at work well.
Q9.14 I can work well without the help of others if necessary.
Q9.15 I usually take stressful things at work as they come.
Q9.16 I can handle difficult moments at work because I have already faced hotter fires.
Q9.17 I can handle many things at the same time at work.

Question 10: scored 1 through 6 (strongly disagree, disagree, slightly disagree, slightly agree, agree, strongly agree)
A few questions now follow about how you view your work at the moment. To what extent do you currently (dis)agree with the following statements?
Q10.1 Because of my 'shyness', I sometimes hesitate to make appointments.
Q10.2 To be honest, people often abuse me.
Q10.3 I sometimes avoid asking questions because I am afraid I am stupid.
Q10.4 If someone is angry about me, I will visit him / her as soon as possible to talk about it.
Q10.5 I find it difficult to say no.
Q10.6 If someone tries to push ahead, I will immediately say something about it.
Q10.7 I give my opinion quickly.
Q10.8 I am confident.
Q10.9 I am perfectionistic.

Question 11: scored 1 through 7 (not at all true, 2, 3, 4, 5, 6, completely true)
To what extent do the statements below apply to you?
Q11.1 I am more moody than others.
Q11.2 My mood goes up and down a lot.
Q11.3 I am more irritable than others.

Question 12: scored 1 through 5 (totally disagree, disagree, neutral, agree, totally agree)
The following questions are about your way of thinking in your work. To what extent do you currently disagree with each of the following statements?
Q12.1 After my workday ends, I forget my work.
Q12.2 After my workday is over, I don't think about my work at all.
Q12.3 After my workday ends, I take my work away.
Q12.4 After my workday ends, I get rid of the demands of my work.
Q12.5 After my workday ends, I relax.
Q12.6 After my workday is over, I do relaxing things.
Q12.7 After my workday ends, I use the time to relax.
Q12.8 After my workday ends I take time for relaxing activities.

Additional questions in second (post) survey:
Control group:
13) Has your confidence in your veterinary skills increased, decreased, or stayed the same in the last few months (since the first survey)? Please explain.

Study group:
13) Has your confidence in your veterinary skills increased, decreased, or stayed the same in the last few months (since the first survey)? Please explain.
14) Do you find EPAs to be a good didactic method to support young veterinarians? Is so, why? If not, why not?
15) Would you recommend veterinary practices with young veterinarian employees to use EPAs? Please explain.
16) How often did you and your coach discuss the EPAs?
17) How often where you actively aware of the EPAs?
18) Do the EPAs provide more insight into the skills you already have and the skills on which you can improve? Please explain.
19) Have the EPAs helped you to develop these particular skills? Please explain.

Appendix 4: Data Tables for self-assessment of the EPA levels (3 EPAs; table 8-10)

Table 8 Pre- and post intervention measurements and resulting change in mean of study group Graduate self-perception regarding skill and knowledge levels for EPA 1: Performing and supervising a consultation for health check and preventive treatments

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=6)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
EPA 1.1	3	4,43	5	0,79	5	4	4,33	5	0,52	4	-0,10
EPA 1.2	4	4,57	5	0,53	5	4	4,50	5	0,55	4 and 5	-0,07
EPA 1.3	4	4,14	5	0,38	4	4	4,33	5	0,52	4	+0,19
EPA 1.4	4	4,43	5	0,53	4	4	4,33	5	0,52	4	-0,10
EPA 1.5	3	3,86	4	0,38	4	3	3,83	4	0,52	4	-0,03
EPA 1.6	3	3,83	4	0,41	4	4	4,33	5	0,41	4	+0,50
EPA 1.7	3	4,00	5	0,58	4	4	4,33	5	0,52	4	+0,33
EPA 1.8	3	3,57	4	0,53	4	3	3,67	4	0,52	4	+0,10
EPA 1.9	3	3,57	4	0,53	4	3	3,83	4	0,41	4	+0,26
EPA 1.10	3	4,14	5	0,69	4	3	4,00	5	0,63	4	-0,14
EPA 1.11	4	4,14	5	0,38	4	4	4,00	4	0,00	4	-0,14
EPA 1.12	4	4,43	5	0,53	4	4	4,50	5	0,55	4 and 5	-0,07
EPA 1.13	3	3,86	4	0,38	4	4	4,17	5	0,41	4	+0,31
EPA 1.14	2	3,29	4	0,76	3 and 4	3	3,83	4	0,41	4	+0,54
EPA 1.15	2	3,57	5	0,98	4	3	4,00	5	0,63	4	+0,43
EPA 1.16	4	4,00	4	0,00	4	4	4,00	4	0,00	4	0,00
EPA 1.17	1	3,43	4	1,13	4	3	4,67	4	0,52	4	+1,24
EPA 1.18	4	4,23	5	0,49	4	4	4,20	5	0,45	4	-0,03
EPA 1.19	4	4,23	5	0,49	4	4	4,17	5	0,41	4	-0,06
EPA 1.20	1	3,29	5	1,25	3	3	3,67	4	0,52	4	+0,38

Table 8 Pre- and post intervention measurements and resulting change in mean of study group Graduate self-perception regarding skill and knowledge levels for EPA 1: Performing and supervising a consultation for health check and preventive treatments

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=6)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
EPA 1.21	3	4,29	5	0,76	4 and 5	4	4,33	5	0,52	4	+0,04
EPA 1.22	2	3,71	5	0,95	4	4	4,17	5	0,41	4	+0,46
EPA 1.23	4	4,57	5	0,53	5	4	4,50	5	0,55	4 and 5	-0,07
EPA 1.24	3	4,00	5	0,58	4	4	4,33	5	0,52	4	+0,33

*Medians were derived from data on a five point scale (corresponding to the 5 levels of entrustment)

***significant change in means*

Positive changes (+) are an increase in self perceived level of entrustment

Negative changes (-) are a decrease in self perceived level of entrustment

Table 9 Pre- and post intervention measurements and resulting change in mean of study group Graduate self-perception regarding skill and knowledge levels for EPA 2: The Work up and guidance of the dog / cat with external otitis

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=6)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in means**
EPA 2.1	4	4,43	5	0,53	5	4	4,67	5	0,52	5	+0,24
EPA 2.2	3	3,71	4	0,49	4	4	4,00	4	0,00	4	+0,29
EPA 2.3	3	3,43	4	0,53	4	3	4,00	5	0,63	4	+0,67
EPA 2.4	1	3,00	4	1,00	4	3	3,67	4	0,52	4	+0,67
EPA 2.5	3	3,71	4	0,49	4	3	3,67	4	0,52	4	-0,04
EPA 2.6	3	3,71	4	0,49	4	4	4,33	5	0,52	4	+0,62*
EPA 2.7	3	3,86	4	0,38	4	4	4,17	5	0,41	4	+0,31

Table 9 Pre- and post intervention measurements and resulting change in mean of study group Graduate self-perception regarding skill and knowledge levels for EPA 2: The Work up and guidance of the dog / cat with external otitis

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=6)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in means**
EPA 2.8	3	3,86	4	0,38	4	4	4,17	5	0,41	4	+0,31
EPA 2.9	3	3,43	4	0,53	4	4	4,17	5	0,41	4	+0,74*
EPA 2.10	4	4,29	5	0,49	5	4	4,33	5	0,52	4	-0,04
EPA 2.11	4	4,23	5	0,53	4	4	4,33	5	0,52	4	+0,10
EPA 2.12	3	3,57	4	0,53	4	4	4,33	5	0,52	4	+0,67
EPA 2.13	4	4,29	5	0,49	4	4	4,17	5	0,41	4	-0,12
EPA 2.14	2	3,00	4	0,63	3	1	3,00	4	1,10	3	0,00
EPA 2.15	2	3,14	4	0,90	4	1	3,00	4	1,10	3	-0,14
EPA 2.16	3	3,43	4	0,53	3	3	3,40	4	0,55	3	-0,03
EPA 2.17	1	1,43	2	0,53	1	1	2,17	4	0,98	2	+0,74
EPA 2.18	1	3,14	4	1,07	3 and 4	3	3,83	4	0,41	4	+0,69
EPA 2.19	3	3,57	4	0,53	4	3	3,67	4	0,52	4	+0,10
EPA 2.20	3	3,86	4	0,38	4	4	4,17	5	0,41	4	+0,31
EPA 2.21	3	3,86	4	0,38	4	3	4,17	5	0,75	4	+0,31

*Medians were derived from data on a five point scale (corresponding to the 5 levels of entrustment)

***significant change in means*

Positive changes (+) are an increase in self perceived level of entrustment

Negative changes (-) are a decrease in self perceived level of entrustment

Table 10 Pre- and post intervention measurements and resulting change in mean of study group Graduate self-perception regarding skill and knowledge levels for EPA 3: Performing and supervising basic surgical procedures

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=6)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in means**
EPA 3.1	4	4,43	5	0,53	4	4	4,50	5	0,55	4 and 5	+0,07
EPA 3.2	4	4,43	5	0,49	4	4	4,33	5	0,52	4	-0,10
EPA 3.3	4	4,43	5	0,53	4	3	4,33	5	0,82	5	-0,10
EPA 3.4	2	3,57	5	0,98	4	3	4,00	5	0,63	4	+0,43*
EPA 3.5	4	4,43	5	0,53	4	4	4,33	5	0,52	4	-0,10
EPA 3.6	4	4,14	5	0,38	4	3	4,00	5	0,63	4	-0,14
EPA 3.7	3	3,86	5	0,69	4	3	4,00	5	0,63	4	+0,14
EPA 3.8	3	3,71	4	0,49	4	3	3,50	4	0,55	3 and 4	-0,21
EPA 3.9	3	3,71	4	0,49	4	3	3,67	4	0,52	4	-0,04
EPA 3.10	3	3,86	4	0,38	4	4	4,33	5	0,52	4	+0,47
EPA 3.11	4	4,14	5	0,38	4	3	3,83	5	0,75	4	-0,31
EPA 3.12	3	3,86	4	0,38	4	3	3,83	4	0,41	4	-0,03
EPA 3.13	1	3,29	4	1,11	4	3	3,67	4	0,52	4	+0,38
EPA 3.14	3	3,86	4	0,38	4	3	3,67	4	0,52	4	-0,19
EPA 3.15	1	3,43	4	1,13	4	4	4,17	5	0,41	4	+0,74

*Medians were derived from data on a five point scale (corresponding to the 5 levels of entrustment)

***significant change in means*

Positive changes (+) are an increase in self perceived level of entrustment

Negative changes (-) are a decrease in self perceived level of entrustment

Appendix 5: Data Tables Questions 1 through 12 related to wellbeing (tables 11-34)

Table 11 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q1

	Pre-intervention Measurement (n=7)					Post-Intervention Measurement (n=7)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q1.1	5	5,86	6	0,38	6	4	5,43	7	1,27	4 and 5 and 7	-0,43
Q1.2	5	6,71	7	0,76	7	5	6,29	7	0,76	6 and 7	-0,42
Q1.3	6	6,29	7	0,49	6	5	5,86	6	0,38	6	-0,43
Q1.4	4	5,29	6	0,76	5 and 6	5	5,58	6	0,53	6	+0,29
Q1.5	1	3,57	6	2,44	1	4	5,29	6	0,95	6	+1,72**
Q1.6	4	4,86	6	0,90	4	4	4,71	6	0,95	4	-0,15
Q1.7	3	4,86	6	1,22	6	3	4,43	7	1,51	4	-0,43
Q1.8	5	6,14	7	0,69	6	4	5,29	7	0,95	5	-0,85
Q1.9	3	5,57	7	1,40	5 and 6 and 7	3	4,86	7	1,57	4	-0,71

**significant change within groups*
***significant change between groups*

Table 12 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q1

	Pre-intervention Measurement (n=7)					Post-Intervention Measurement (n=7)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q1.1	4	5,71	7	0,95	6	5	5,86	7	0,69	6	+0,15
Q1.2	4	6,14	7	1,21	7	5	6,14	7	1,07	7	0,00

Q1.3	5	6,29	7	0,76	6 and 7	4	5,86	7	1,07	6	-0,43
Q1.4	4	5,43	6	0,79	6	4	5,57	6	0,79	6	+0,14
Q1.5	1	4,71	7	2,06	5 and 6	3	4,86	6	1,21	6	+0,15**
Q1.6	2	5,14	7	1,68	6	4	5,00	6	1,00	4 and 6	-0,14
Q1.7	3	5,14	7	1,35	5 and 6	2	4,71	6	1,89	6	-0,43
Q1.8	4	6,00	7	1,16	7	3	5,56	7	1,62	7	-0,44
Q1.9	2	5,00	7	1,83	4 and 7	3	5,00	6	1,29	6	0,00

**significant change within groups*
***significant change between groups*

Table 13 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q2

	Pre-Intervention Measurement (n=7)					**Post-Intervention Measurement (n=5)**					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q2.1	2	3,00	4	0,82	3	2	3,00	4	0,71	3	0,0
Q2.2	2	3,00	4	1,00	2 and 4	2	3,00	4	0,71	3	0,0
Q2.3	1	2,86	5	1,22	3	2	2,40	3	0,55	2	-0,46
Q2.4	1	2,71	5	1,50	1 and 3	2	2,20	3	0,45	2	-0,51
Q2.5	1	2,00	3	0,58	2	1	1,80	3	0,84	1 and 2	-0,20
Q2.6	1	2,14	4	1,07	2	1	2,20	3	0,84	1 and 2	+0,06
Q2.7	1	2,14	4	1,07	2	1	2,20	4	1,10	2	+0,06
Q2.8	1	1,86	3	0,70	2	1	1,60	2	0,55	2	-0,16
Q2.9	1	1,86	3	0,70	2	1	1,80	3	0,84	1 and 2	-0,06
Q2.10	1	2,14	3	0,70	2	1	2,00	3	0,71	2	-0,14
Q2.11	1	2,14	3	0,70	2	1	1,80	2	0,45	2	-0,34**

Q2.12	2	2,43	3	0,54	2		2	2,20	3	0,45	2	-0,23
Q2.13	2	2,43	3	0,54	2		2	2,00	2	0,00	2	-0,43

**significant change within groups*
***significant change between groups*

Table 14 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q2

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=7)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q2.1	2	3,14	4	0,90	4	2	3,14	4	0,69	3	0,00
Q2.2	2	2,86	4	0,90	2	2	2,57	4	0,79	2	-0,29
Q2.3	1	2,43	5	1,27	2	2	2,57	4	0,79	2	+0,14
Q2.4	2	2,71	4	0,95	2	2	2,86	4	0,90	2	+0,15
Q2.5	1	2,00	3	0,58	2	1	2,14	3	0,90	3	+0,14
Q2.6	1	2,00	4	1,15	1	1	2,00	4	1,15	1	0,00
Q2.7	1	2,14	4	1,21	1	1	2,43	4	1,13	3	+0,29
Q2.8	1	2,29	4	0,95	2	1	2,14	4	0,90	2	-0,15
Q2.9	1	2,14	3	0,90	3	1	2,00	4	1,00	2	-0,14
Q2.10	2	2,71	3	0,49	3	1	2,29	4	1,11	1 and 2 and 3	-0,42
Q2.11	1	1,71	2	0,49	2	2	2,00	2	0,00	2	+0,29**
Q2.12	2	2,14	3	0,38	2	2	2,14	3	0,38	2	0,00
Q2.13	1	2,14	3	0,69	2	1	2,00	3	0,58	2	-0,14

**significant change within groups*
***significant change between groups*

Table 15 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q3

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=5)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q3.1	3	3,29	4	0,49	3	2	3,00	4	1,00	2 and 4	-0,29

Q3.2	2	3,00	4	1,00	2 and 4	2	3,00	4	0,71	3	0,00
Q3.3	2	3,43	4	0,79	4	2	3,00	4	0,71	3	-0,43
Q3.4	2	3,00	4	1,00	2 and 4	2	3,40	4	0,89	4	+0,40**
Q3.5	2	2,71	4	0,95	2	2	2,60	3	0,55	3	-0,11
Q3.6	3	3,86	4	0,39	4	2	3,60	4	0,89	4	-0,26
Q3.7	3	3,71	4	0,49	4	2	3,80	5	1,10	4	+0,09
Q3.8	3	3,57	4	0,54	4	2	3,40	5	1,34	2 and 4	-0,17
Q3.9	3	3,71	4	0,49	4	2	3,80	5	1,10	4	+0,09
Q3.10	2	3,57	5	0,98	4	3	4,00	5	0,71	4	+0,43
Q3.11	3	4,14	5	0,90	5	3	3,80	5	0,84	3 and 4	-0,34
Q3.12	2	3,29	4	0,95	4	3	3,60	4	0,55	4	+0,31
Q3.13	2	2,57	4	0,79	2	2	2,80	4	0,84	2 and 3	+0,23
Q3.14	2	2,71	4	0,95	2	1	2,60	4	1,14	3	-0,11
Q3.15	2	3,14	4	0,69	3	3	3,40	4	0,55	3	+0,26

**significant change within groups*
***significant change between groups*

Table 16 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q3

	Pre-Intervention Measurement (n=7)					**Post-Intervention Measurement (n=7)**					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q3.1	2	3,29	4	0,76	3 and 4	2	2,57	3	0,53	3	-0,72
Q3.2	3	3,29	4	0,49	3	2	2,71	3	0,49	3	-0,58
Q3.3	2	3,14	4	0,90	4	2	2,43	3	0,53	2	-0,71
Q3.4	2	2,43	3	0,53	2	2	2,00	2	0,00	2	-0,43**

Q3.5	2	3,29	4	0,76	3 and 4	3	3,14	4	0,38	3	-0,15
Q3.6	3	4,00	5	0,76	4	2	3,71	5	1,11	3 and 4 and 5	-0,29
Q3.7	3	4,00	5	0,58	4	2	3,43	5	0,98	3	-0,57
Q3.8	1	3,43	5	1,51	4 and 5	2	3,57	5	0,98	4	+0,14
Q3.9	2	3,86	5	1,07	4	3	4,00	5	0,82	4	+0,14
Q3.10	2	3,43	5	1,13	4	2	3,57	4	0,79	4	+0,14
Q3.11	2	3,86	5	1,07	4	2	3,43	4	0,79	4	-0,43
Q3.12	2	3,71	5	0,95	4	2	3,57	4	0,79	4	-0,14
Q3.13	1	2,57	4	1,13	2	2	3,00	4	0,82	4	+0,43
Q3.14	1	2,57	5	1,40	2	2	2,86	4	0,69	4	+0,29
Q3.15	2	2,86	4	0,90	2	2	3,29	4	0,76	4	+0,43

**significant change within groups*
***significant change between groups*

Table 17 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q4

	Pre-Intervention Measurement (n=7)					**Post-Intervention Measurement (n=5)**					
	Min	**Mean**	**Max**	**SD**	**Mode(s)**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in mean**
Q4.1	2	2,71	4	0,76	2 and 3	1	2,00	3	0,71	2	-0,72
Q4.2	1	2,43	4	0,98	2	2	2,40	3	0,55	2	-0,03
Q4.3	2	2,71	4	0,95	2	2	2,60	3	0,55	3	-0,11**
Q4.4	2	3,00	5	1,41	2	2	2,00	2	0,00	2	-1,00**

**significant change within groups*
***significant change between groups*

Table 18 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q4

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=7)					
	Min	**Mean**	**Max**	**SD**	**Mode**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in mean**
Q4.1	1	2,29	4	1,25	2	2	2,14	3	0,38	2	-0,15*
Q4.2	1	2,43	4	0,98	2	1	1,86	2	0,38	2	-0,57
Q4.3	1	2,43	4	0,98	2	1	1,57	2	0,53	2	-0,86**
Q4.4	2	2,57	4	0,79	2	2	2,00	2	0,00	2	-0,57**

**significant change within groups*
***significant change between groups*

Table 19 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q5

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=5)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in mean**
Q5.1	2	2,71	4	0,76	2 and 3	2	2,40	3	0,55	2	-0,31
Q5.2	2	2,57	4	0,79	2	2	2,40	3	0,55	2	-0,17
Q5.3	2	2,71	3	0,49	3	2	2,40	3	0,55	2	-0,31
Q5.4	2	2,86	3	0,38	3	2	2,60	3	0,55	3	-0,26

**significant change within groups*
***significant change between groups*

Table 20 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q5

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=7)					
	Min	**Mean**	**Max**	**SD**	**Mode**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in mean**
Q5.1	2	2,57	3	0,53	3	2	2,29	3	0,49	2	-0,28
Q5.2	2	2,14	3	0,38	2	1	2,00	3	0,58	2	-0,14
Q5.3	2	2,00	2	0,00	2	2	2,00	2	0,00	2	0,00
Q5.4	2	2,42	3	0,53	2	2	2,29	3	0,49	2	-0,13

**significant change within groups*
***significant change between groups*

Table 21 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q6

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=5)					
	Min	**Mean**	**Max**	**SD**	**Mode**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in means**
Q6.1	3	3,86	4	0,38	4	2	3,20	4	0,84	3 and 4	-0,66
Q6.2	2	3,57	4	0,79	4	3	3,40	4	0,55	3	-0,17
Q6.3	4	4,29	5	0,49	4	3	4,20	5	0,84	4 and 5	-0,09
Q6.4	4	4,29	5	0,49	4	3	4,00	5	1,00	3 and 5	-0,29
Q6.5	2	3,71	5	0,95	4	2	2,60	4	0,89	2	-0,11
Q6.6	1	3,00	4	1,29	4	2	3,00	4	1,00	2 and 4	0,00
Q6.7	3	4,00	5	0,58	4	1	2,80	5	1,64	2	-1,20
Q6.8	2	4,00	5	1,00	4	1	2,80	5	1,64	2	-1,20

**significant change within groups*
***significant change between groups*

Table 22 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q6

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=7)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q6.1	3	4,00	5	0,82	4	3	3,86	5	0,69	4	-0,14
Q6.2	2	3,71	5	0,95	4	2	3,71	5	0,98	4	0,00
Q6.3	4	4,57	5	0,53	5	2	3,57	5	0,98	4	-1,00
Q6.4	4	4,29	5	0,49	4	2	3,57	5	1,27	2 and 4 and 5	-0,72
Q6.5	1	3,14	5	1,35	3 and 4	2	3,43	4	0,79	4	+0,29
Q6.6	1	3,29	5	1,25	3	2	3,43	4	0,79	4	+0,14
Q6.7	2	3,43	5	1,13	4	2	3,57	5	0,98	4	+0,14
Q6.8	2	3,86	5	1,07	4	3	3,57	5	0,79	3	-0,29

**significant change within groups*
***significant change between groups*

Table 23 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q7

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=5)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in mean**
Q7.1	1	2,00	4	1,16	1	1	1,80	2	0,45	2	-0,20
Q7.2	1	1,29	2	0,49	1	1	1,40	2	0,55	1	+0,11
Q7.3	1	1,29	3	0,76	1	1	1,00	1	0,00	1	-0,29**
Q7.4	1	1,14	2	0,38	1	1	1,60	2	0,55	2	+0,46

Q7.5	1	1,71	4	1,11	1	1	1,60	2	0,55	2	-0,11
Q7.6	1	1,71	3	0,76	1 and 2	1	1,40	2	0,55	1	-0,31
Q7.7	1	1,43	3	0,79	1	1	1,20	2	0,45	1	-0,23
Q7.8	1	1,57	3	0,79	1	1	1,60	2	0,55	2	+0,03
Q7.9	1	1,86	3	0,90	1	1	1,20	2	0,45	1	-0,66
Q7.10	1	1,14	2	0,38	1	1	1,20	2	0,45	1	+0,06
Q7.11	1	1,86	4	1,22	1	1	1,20	2	0,45	1	-0,66
Q7.12	1	1,71	4	1,25	1	1	1,40	2	0,55	1	-0,31
Q7.13	1	1,43	3	0,79	1	1	1,20	2	0,45	1	-0,23
Q7.14	1	1,43	4	1,13	1	1	1,00	1	0,00	1	-0,43

**significant change within groups*
***significant change between groups*

Table 24 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q7

	Pre-Intervention Measurement (n=7)					**Post-Intervention Measurement (n=7)**					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in mean**
Q7.1	1	2,43	4	1,27	1 and 2 and 4	1	2,14	4	1,07	2	-0,29
Q7.2	1	1,57	3	0,79	1	1	1,57	3	0,79	1	0,00
Q7.3	1	1,14	2	0,38	1	1	1,43	2	0,53	1	+0,29**
Q7.4	1	1,86	3	0,69	2	1	1,71	2	0,49	2	-0,15
Q7.5	1	1,43	2	0,53	1	1	1,29	3	0,76	1	-0,14
Q7.6	1	1,71	3	0,76	1 and 2	1	1,29	2	0,49	1	-0,42
Q7.7	1	1,29	3	0,76	1	1	1,14	2	0,38	1	-0,15
Q7.8	1	1,71	3	0,76	1 and 2	1	1,43	3	0,79	1	-0,27
Q7.9	1	1,43	2	0,53	1	1	1,14	2	0,38	1	-0,29
Q7.10	1	1,71	3	0,76	1 and 2	1	1,29	2	0,49	1	-0,42

Q7.11	1	1,86	3	0,90	1	1	1,29	3	0,76	1	-0,57
Q7.12	1	1,14	2	0,38	1	1	1,71	2	0,49	2	-0,57*
Q7.13	1	1,43	3	0,79	1	1	1,43	3	0,49	1	0,00
Q7.14	1	1,29	3	0,76	1	1	1,14	2	0,28	1	-0,15

**significant change within groups*
***significant change between groups*

Table 25 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q8

	Pre-Intervention Measurement (n=7)					**Post-Intervention Measurement (n=5)**					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q8.1	3	3,86	4	0,38	4	3	4,00	5	0,71	4	+0,14
Q8.2	4	4,00	4	0,00	4	4	4,20	5	0,45	4	+0,20
Q8.3	2	3,29	5	1,25	2 and 4	2	2,80	5	1,30	2	-0,49**
Q8.4	1	2,29	3	0,95	3	2	2,60	4	0,89	2	+0,31
Q8.5	1	3,43	5	1.40	4	2	3,40	5	1,34	2 and 4	-0,03
Q8.6	1	3,43	5	1.51	4 and 5	2	2,80	4	0.84	2 and 3	-0,63
Q8.7	1	2,57	4	0,98	3	2	2,80	4	1,10	2	+0,23
Q8.8	1	3,43	5	1,27	4	3	3,40	5	0,89	3	-0,03
Q8.9	1	3,57	5	1,51	4	2	3,40	5	1,14	3	-0,17
Q8.10	2	3,71	5	0,95	4	3	3,80	5	0,84	3 and 4	+0,09
Q8.11	2	3,43	5	1,13	4	2	2,80	4	1,10	2	-0,63
Q8.12	1	1,86	3	0,69	2	2	2,20	3	0,45	2	+0,34
Q8.13	2	3,57	4	0,79	4	2	3,40	4	0,89	4	-0,17
Q8.14	2	3,57	4	0,79	4	2	3,00	5	1,22	2 and 3	-0,57
Q8.15	2	3,14	4	0,90	4	2	2,60	5	1,34	2	-0,54

*significant change within groups
**significant change between groups

Table 26 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q8

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=6)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q8.1	3	3,86	5	0,69	4	4	4,17	5	0,41	4	+0,31
Q8.2	4	4,14	5	0,38	4	4	4,33	5	0,52	4	+0,19
Q8.3	2	3,00	5	1,15	2	3	3,67	5	0,82	3	+0,67**
Q8.4	1	2,29	4	0,95	2	2	2,67	4	0,82	2	+0,38
Q8.5	2	3,29	5	1,25	2 and 4	3	3,83	4	0,41	4	+0,54
Q8.6	2	2,71	4	0,95	2	2	2,83	3	0,41	3	+0,12
Q8.7	2	2,00	2	0,00	2	2	2,50	4	0,84	2	+0,50
Q8.8	2	3,14	5	1,07	3	2	3,17	5	1,17	2 and 3	+0,03
Q8.9	2	3,29	5	1,11	2 and 3 and 4	2	3,17	5	1,17	2 and 3	-0,12
Q8.10	2	3,43	5	1,13	3	2	3,67	5	1,03	4	+0,24
Q8.11	2	3,43	5	1,13	4	2	4,17	5	1,17	5	+0,74
Q8.12	2	2,71	4	0,76	2 and 3	1	2,67	4	1,21	2 and 4	-0,04
Q8.13	3	3,43	4	0,53	3	1	2,83	4	1,33	4	-0,60
Q8.14	2	3,14	4	0,90	4	2	3,33	5	1,03	3	-0,19
Q8.15	2	3,14	4	1,07	4	1	3,17	5	1,47	4	+0,03

*significant change within groups
**significant change between groups

Table 27 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q9

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=5)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q9.1	3	4,57	5	0,79	5	2	3,60	5	1,52	2 and 5	-0,97**
Q9.2	2	2,71	5	1,11	2	1	2,60	5	1,52	2	-0,11
Q9.3	2	4,14	6	1,35	4 and 5	2	4,20	5	1,30	5	+0,06
Q9.4	3	4,43	6	0,98	4	4	4,60	5	0,55	5	+0,27
Q9.5	1	2,14	3	0,69	2	1	2,40	4	1,14	2	+0,26
Q9.6	1	3,57	5	1,40	3 and 4 and 5	3	4,20	5	1,10	5	+0,63
Q9.7	3	4,57	5	0,79	5	4	4,60	5	0,55	5	+0,03
Q9.8	3	4,57	5	0,79	5	4	4,60	5	0,55	5	+0,03
Q9.9	3	4,14	5	0,90	5	4	4,60	5	0,55	5	+0,46
Q9.10	3	4,57	6	0,98	5	4	4,40	5	0,55	4	-0,17
Q9.11	2	3,71	5	1,11	3 and 4 and 5	3	4,40	5	0,89	5	+0,69
Q9.12	2	4,29	6	1,50	4 and 6	2	3,60	5	1,14	4	-0,69
Q9.13	3	4,29	5	0,95	5	4	4,80	5	0,45	5	+0,51
Q9.14	4	5,29	6	0,76	5 and 6	5	5,40	6	0,55	5	+0,11
Q9.15	3	4,43	6	1,13	5	3	4,40	5	0,89	5	-0,03
Q9.16	3	4,29	5	0,76	4 and 5	4	4,60	5	0,55	5	+0,31
Q9.17	2	4,43	6	1,40	5	4	4,40	5	0,55	4	-0,03

**significant change within groups*
***significant change between groups*

Table 28 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q9

	Pre-Intervention Measurement (n=7)					Post-Intervention Measurement (n=7)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q9.1	1	4,14	5	0,46	5	4	4,83	6	0,75	5	+0,69**
Q9.2	2	2,14	3	0,38	2	2	2,33	4	0,82	2	+0,19
Q9.3	2	3,86	5	1,07	4	2	4,00	5	1,26	5	+0,14
Q9.4	3	4,71	6	1,11	4 and 5 and 6	3	5,00	6	0,63	5	+0,29
Q9.5	2	2,71	4	0,76	2 and 3	2	2,17	3	0,41	2	-0,54
Q9.6	2	4,00	5	1,00	4	1	4,17	5	1,6	5	+0,17
Q9.7	3	4,14	5	0,90	5	4	4,50	5	0,55	4 and 5	+0,36
Q9.8	4	4,57	5	0,53	5	4	4,50	5	0,55	4 and 5	-0,07
Q9.9	3	4,00	5	0,58	4	4	4,33	5	0,52	4	+0,33
Q9.10	3	4,43	6	1,13	5	4	4,67	5	0,52	5	+0,24
Q9.11	1	3,86	5	1,46	5	2	4,17	5	1,70	5	+0,31
Q9.12	2	3,43	6	1,62	2	1	3,67	4	1,63	4	+0,24
Q9.13	2	4,14	5	1,07	4 and 5	1	4,17	5	1,60	5	+0,03
Q9.14	2	4,29	5	1,11	5	2	4,20	5	1,30	5	-0,09
Q9.15	2	4,29	6	1,25	4	4	4,50	44	0,55	4 and 5	+0,21
Q9.16	2	4,00	5	1,15	5	2	4,00	4	1,10	4	0,00
Q9.17	2	3,86	5	1,07	4	2	4,00	4	1,10	4	+0,14

**significant change within groups*
***significant change between groups*

Table 29 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q10

	Pre- Intervention Measurement (n=7)					Post-Intervention Measurement (n=5)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q10.1	1	3,00	6	1,83	1 and 4	2	2,60	4	0,89	2	-0,40
Q10.2	1	3,43	6	1,62	4	1	3,00	4	1,41	4	-0,43
Q10.3	1	2,86	5	1,57	2	1	2,20	5	1,64	1 and 2	-0,66
Q10.4	3	3,57	5	0,98	3	3	3,60	5	0,89	3	+0,03
Q10.5	2	4,86	6	1,46	6	2	3,40	5	1,34	2 and 4	-1,46
Q10.6	2	4,14	6	1,35	4 and 5	3	4,00	5	1,00	3 and 5	-0,14
Q10.7	1	3,71	5	1,38	4	3	3,80	5	0,84	3 and 4	+0,09
Q10.8	2	4,14	5	1,07	4 and 5	3	4,20	5	0,84	4 and 5	+0,06
Q10.9	3	4,86	6	1,07	5	3	4,80	6	1,30	6	-0,06

**significant change within groups*
***significant change between groups*

Table 30 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q10

	Pre- Intervention Measurement (n=7)					Post-Intervention Measurement (n=6)					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in mean**
Q10.1	1	2,43	6	1,62	2	2	3,00	5	1,55	5	+0,57
Q10.2	1	2,29	4	1,25	2	2	2,33	4	0,82	4	+0,04
Q10.3	2	3,29	6	1,60	2	2	3,17	5	1,33	5	-0,12
Q10.4	2	3,43	4	0,79	4	1	3,33	5	1,51	5	-0,10
Q10.5	2	4,00	6	1,29	4	3	3,83	6	1,17	6	-0,17

Q10.6	2	3,29	5	1,11	2 and 3 and 4	2	2,67	4	0,82	4	-0,62
Q10.7	1	3,14	5	1,21	3	1	3,50	5	1,52	5	+0,36
Q10.8	1	3,57	5	1,61	5	1	4,00	5	1,67	5	+0,43
Q10.9	3	4,43	6	1,13	5	3	4,17	5	0,98	5	-0,26

**significant change within groups*
***significant change between groups*

Table 31 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q11

	Pre-Intervention Measurement (n=7)					**Post-Intervention Measurement (n=5)**					
	Min	**Mean**	**Max**	**SD**	**Mode(s)**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in mean**
Q11.1	1	2,00	5	1,41	1 and 2	1	2,80	5	1,64	2	+0,80
Q11.2	1	2,00	5	1,53	1	2	2,60	4	0,89	2	+0,60
Q11.3	1	2,57	5	1,72	1	1	3,00	6	1,87	3	+0,03

**significant change within groups*
***significant change between groups*

Table 32 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q11

	Pre-Intervention Measurement (n=7)					**Post-Intervention Measurement (n=6)**					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode (s)**	**Change in mean**
Q11.1	1	2,71	5	1,38	2	1	2,17	4	1,17	1 and 2	-0,54
Q11.2	1	2,86	6	1,95	1 and 2	1	2,67	5	1,37	2 and 3	-0,19

Q11.3	1	2,86	5	1,57	2	1	2,50	6	1,76	2	-0,36

**significant change within groups*
***significant change between groups*

Table 33 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the control group for Q12

	Pre-Intervention Measurement (n=7)					**Post-Intervention Measurement (n=5)**					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in mean**
Q12.1	1	1,86	3	0,70	2	2	2,00	2	0,00	2	+0,14
Q12.2	1	1,71	3	0,76	1 and 2	2	2,00	2	0,00	2	+0,29
Q12.3	1	2,83	4	1,17	3 and 4	2	3,00	4	0,71	3	+0,17
Q12.4	1	3,00	4	1,16	4	2	3,40	4	0,89	4	+0,40
Q12.5	3	4,00	5	0,58	4	4	4,00	4	0,00	4	0,00
Q12.6	4	4,14	5	0,38	4	4	4,20	5	0,45	4	+0,06
Q12.7	4	4,14	5	0,38	4	4	4,00	4	0,00	4	-0,14
Q12.8	3	3,86	4	0,38	4	3	3,60	4	0,55	4	-0,26

**significant change within groups*
***significant change between groups*

Table 34 Minimum, Mean, Maximum, SD and Mode(s) for the pre- and post-intervention measurements of the study group for Q12

	Pre-Intervention Measurement (n=7)					**Post-Intervention Measurement (n=6)**					
	Min	**Mean**	**Max**	**SD**	**Mode (s)**	**Min**	**Mean**	**Max**	**SD**	**Mode**	**Change in mean**

Q12.1	1	2,29	3	0,76	2 and 3	2	3,00	4	0,63	3	+0,71
Q12.2	2	2,14	3	0,38	2	2	2,50	4	0,84	2	+0,36
Q12.3	2	3,14	4	0,90	4	2	3,67	4	0,82	4	+0,53
Q12.4	2	3,14	4	1,07	4	2	3,50	4	0,84	4	+0,36
Q12.5	2	3,71	4	0,76	4	2	4,00	5	1,09	4	+0,29
Q12.6	3	4,00	5	0,58	4	3	4,17	5	0,75	4	+0,17
Q12.7	3	3,86	5	0,69	4	3	4,17	5	0,75	4	+0,31
Q12.8	3	3,71	5	0,76	3 and 4	3	4,17	5	0,75	4	+0,46

**significant change within groups*
***significant change between groups*