Obesity in all its Aspects: Causes, Consequences and Curative Treatment

Veterinarians' Perspective on Obesity Management

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Preface

I would like to express my gratitude to all respondents that completed the survey, for this study could not have been done without you. Also, thanks to all veterinary association pages on social media that allowed the survey to be distributed. Finally, I would like to express my sincere gratitude to my supervisors Prof. dr. Catherine Delesalle, ms. De Meeûs and Prof. dr. Myriam Hesta. Your time, energy and guidance has been of great inspiration to persevere with this study.

Table of content

Preface
Table of content

1. Abstract

Obesity is the most important nutritional disease in small animal medicine at this moment (Mason, 1970; Carciofi et al., 2005; McGreevy et al., 2005; German, 2006; Bland et al., 2009; Fascetti et al., 2012). This study presents an estimated prevalence of overweight, BCS 6-7/9, of 41.4% (+/- 19.8) on average. Clinical prevalence of obesity, BCS 8-9/9, was estimated at 12.5% on average (+/- 10.9). This dissertation is a limited research study and aims to investigate how obesity is managed within the small animal clinics in Belgium and the Netherlands and which factors can be improved in order to decrease prevalence and improve treatment of this severe condition in cats and dogs. It concluded that veterinarians experience more therapeutic success in canine obesity management, than in feline obesity management. Avoiding discussing obesity influences therapy success negatively, while addressing obesity influences therapy success positively. Calculating the individual caloric need to determine the amount of weight loss food should be preferred to using the described amount on the packaging. Elaborating on the type of exercise needed to induce weight loss influences mean therapy success positively in cats. How follow up appointments are made, influences mean therapy success significantly. Biweekly follow up appointments are preferred to waiting for the client to contact the clinic. Assisting staff members influence therapy success positively when handed the responsibility of the follow up. In cases of therapy failure, veterinary action afterwards can still influence mean therapy success positively.

2. Samenvatting

Obesitas is het meest belangrijke nutritionele probleem binnen de geneeskunde van de gezelschapsdieren (Mason, 1970; Carciofi et al., 2005; McGreevy et al., 2005; German, 2006; Bland et al., 2009; Fascetti et al., 2012). Deze studie geeft een geschatte prevalentie weer van overgewicht, BCS 6-7/9, van gemiddeld 41.4% (+/- 19.8). De prevalentie van obesitas, BCS 8-9/9, werd gemiddeld 12.5% (+/- 10.9) geschat.

Deze masterproef is een beperkt onderzoek en heeft als doel te onderzoeken hoe obesitas gemanaged wordt binnen de gezelschapsdieren praktijk in België en Nederland, en welke factoren verbeterd kunnen worden om de prevalentie te laten dalen en de behandeling van deze ernstige aandoeningen bij kat en hond te kunnen verbeteren.

Er kan geconcludeerd worden dat dierenartsen gemiddeld meer therapiesucces ervaren in de behandeling van obesitas bij honden dan bij katten. Het vermijden van het onderwerp "obesitas" heeft een negatieve invloed op therapiesucces, terwijl het actief benoemen van obesitas een positieve invloed uitoefent op het gemiddeld therapiesucces. Qua diagnostiek, is het berekenen van de individuele calorische behoefte is een betere methode dan de hoeveelheid voeding te bepalen aan de hand van de voederverpakking. Bij katten, heeft ook uitleggen welk type beweging van belang is voor gewichtsverlies, invloed op therapiesucces. Hoe opvolging aangepakt wordt, heeft een significant invloed op therapiesucces. Opvolging iedere twee weken geeft beter therapiesucces dan afwachten tot de cliënt de praktijk contacteert. De assistent kan best ingezet worden om de opvolging van obesitas patiënten over te nemen.

3. Introductory literature study

3.1. Introduction

Obesity is considered one of the most challenging issues in small animal medicine at this moment. In general, it is considered the most important nutritional disease in companion animals worldwide (Mason, 1970; Carciofi et al., 2005; McGreevy et al., 2005; German, 2006; Bland et al., 2009; Fascetti et al., 2012). In the feline population obesity is the second most prevalent disease next to dental disease (Lund et al., 1999; Robertson, 1999; Allan et al., 2000; Colliard et al., 2009; Cave et al.,2012).

Obesity can be defined in different ways. Some authors define obesity as body weight 10-25% above the ideal body weight (Burkholder and Bauer, 1998; Gossellin et al., 2007; Bland et al., 2009), whereas others use an increase in the body condition score to define obesity (Gossellin et al., 2007; Linder and Mueller, 2014). Others only consider dogs obese, when their excessive body weight causes adverse health effects (National Institutes of Health, 1985; Kopelman, 2000; German et al., 2010; Fascetti and Delaney, 2012). In human medicine scientists have left the idea of using "body weight" per se, as a golden standard to define "obesity". It is well known that the "fat percentage" of the body plays a crucial role. First there was the concept of "body mass index", keeping in mind the body height of a person, related to his or her weight. Nowadays, more attention is directed towards where "fat accumulations" are located. An increasing load of scientific studies point out that "abdominal fat" accumulation needs to be considered as more important when it comes to diseases associated with obesity. Apparently, abdominal fat triggers more pro-inflammatory processes and together with that, more hormonal influences such as insulin resistance, when compared to fat accumulation around the hip region. These considerations are not made in practice for dogs and cats, yet. Instead, the body condition score, BCS, is used to quantify excess body mass and can give an estimation of the excess body fat percentage when combined with the body fat index, BFI.

Also, differentiation can be made between overweight and obesity. Animals are considered overweight when their body weight exceeds ideal body weight by 10-19% and obese when their body weight exceeds ideal body weight by more than 20% (Burkholder and Toll, 2000; Courcier et al., 2010). When using the BCS, overweight correlates to a BCS of 6 or 7 out of 9, while obesity correlates to a BCS 8 out of 9 (Gossellin et al., 2007). This study uses the definition for overweight and obesity from Gosselin et al (2007).

Just like in humans, obesity seems to take on epidemic proportions in cats and dogs. Recent prevalence studies are shown in table 1 and show high prevalence of obesity in dogs as well as cats, and also show an increase in prevalence in the United States of America (Donoghue et al., 1991; Scarlett et al., 1994; Lund et al., 2005; Lund et al, 2006). Although UK prevalence for feline obesity seemingly decreases, Tarkosova (2016) reported higher sensibility to error in data from the Courcier (2012) study, due to different level of assessment of the body condition score in the 2010 study compared to the 2012 study, as well as a significant age difference in the feline patients assessed.

In parallel, human obesity is also increasing, which might result in a further increase of dog obesity, since obese owners are more likely to own an obese dog (Kienzle, 2002; Bland, 2009), which is a quite interesting finding.

3.1.1. Causes of obesity and their clinical prevalence

Obesity is a multifactorial disease. It is primarily caused by a disturbed balance between energy intake and energy expenditure. However several diseases and drugs can also be the primary cause for developing obesity (German, 2006). Furthermore, predisposing factors include genetic predisposition (Edney and Smith, 1986; Bland et al., 2009; Raffan et al.,

Table 1: prevalence of overweight and obese companion animals

Country	Prevalence	Species	Source
USA			
1994	25,0%	Cat	Scarlett et al. (1994)
1991	22,9%	Dog	Donoghue et al. (1991)
2005	35,1%	Cat	Lund et al.(2005)
2006	34,1%	Dog	Lund et al. (2006)
UK			
1998	52,0%	Cat	Russell et al. (2000)
2010	59,3%	Dog	Courcier et al. (2010) (a)
	52,0%	Cat	Courcier et al. (2010) (b)
2012	11,5%	Cat	Courcier et al.(2012)
France			
2006	38,8%	Dog	Colliard et al. (2006)
2009	26,8%	Cat	Colliard et al. (2009)
The Netherlands			
2013	19,7%	Dog	Corbee (2013)
2014	50,0%	Cat	Corbee (2014)

2016), spaying and neutering and owner management (Burkholder and Bauer, 1998; Bland et al., 2009).

A more recent study uncovered the veterinarian as possible contributing factor to the current prevalence of obesity, due to insecurity about their own knowledge, lack of time or a fear of upsetting clients (Churchill and Ward, 2016).

3.1.2. Consequences of obesity

Obesity is a nutritional disorder with an excess of adipose tissue that, as German (2010) put it, is no longer considered to be 'a passive fuel depot'. Adipose tissue secretes adipokines that have a wide variety of effects all around the body, affecting 'glucose homeostasis, inflammation and immunity, hemostasis, fluid balance, vascular biology, hematopoiesis, cell proliferation, angiogenesis and neurotrophic functions' (Radin et al., 2009; German et al., 2010). Therefore, we need to leave the view that fat is merely a passive fuel depot, ready to be used in case of increased energy demands. On the contrary, it needs to be viewed as the largest endocrine organ in the body of an obese organism.

In a more clinical perspective, obesity in dogs has been identified as a risk factor for developing metabolic abnormalities and endocrinopathies, renal pathology, cardiorespiratory disease, dermatopathies, renal pathology, orthopedic disorders, reduced reproductive efficiency and a variety of functional abnormalities, such as exercise intolerance and dyspnea and increased risk when under anesthesia (Robertson, 2003; German, 2006; Becvarova, 2011; Pelosi et al., 2013). In feline patients, obesity also increases the risk of developing type II diabetes mellitus, hepatic lipidosis and feline lower urinary tract disorder or FLUTD. (Robertson, 1999; German, 2006; Becvarova, 2011; Raffan, E., 2013; Pérez-Sánchez et al., 2015). Of all these abnormalities, exercise intolerance, orthopedic and cardiorespiratory disease, as well as insulin resistance and dyslipidemias can be reduced or resolved with weight loss (Diez and Ngunyen, 2006; Pelosi et al., 2013). With that respect, scientific studies performed in dogs and cats match with expectations, in comparison with what is already know in human medicine.

3.2. Addressing obesity

3.2.1. Vet responsibility in animal welfare

Pet obesity can be considered a sensitive subject to discuss with pet owners. Not only veterinarians, but the entire veterinary team tends to avoid the topic altogether in fear of upsetting, or even losing, clients to this topic (Churchill and Ward, 2016). When weight loss is not achieved, veterinary team members can become less motivated to confront clients with their pets obesity (Churchill and Ward, 2016). However, client questionnaires have shown that dog owners preferably receive advice from their veterinarian and expect them to inform and educate them on items related to their pet's wellbeing (Coe et al., 2008; Bland et al., 2010). One could thus argue that this 'professional anxiety', as Churchill and Ward (2016) called it, is not only unfounded but also aids in failing to meet client expectations, which may adversely affect client satisfaction, client compliance and veterinarian satisfaction, similar as in human medicine (Coe et al., 2008). Proper communication can be a tool to improve patient expectation and result in higher standards of patient care.

Furthermore, the veterinary profession is required by law to protect animals and guard their wellbeing. This includes owner education on physiological and ethological needs of the pet, as pet owners are in their turn obliged by law to do everything in their power to succumb to these physiological and ethological needs in terms of recommended housing, nurturing and nutrition (Burgelman and De Vliegher, 2016).

Moral as well as legal obligation add up to a professional responsibility that undeniably result in addressing obesity to pet owners as mandatory. Waiving this mandate will neither benefit the patient, the client nor the veterinarian (Coe et al., 2008).

3.2.2. Principles of owner education

3.2.2.1. The need for owner education

Every client and pet should be assessed as an individual case, and owner education can help create a successful individualized weight loss program (Roudebush et al., 2008). For example, by educating pet owners to assess their pet's BCS (Chauvet et al., 2011; Churchill and Ward, 2016). Chauvet et al. (2011) concluded that additional client education significantly leads to more weight loss, when combined with an exercise regime. The influence of client education only on weight loss was, however, not researched in this study. Yaissle et al. (2004) found that owners that received owner education with a weight loss plan had no better results after a 24-month weight loss program for dogs, compared to the control group that received no additional owner education.

Regardless of the need for client education, awareness of certain principles of client communication can help the veterinarian when talking to clients about their pet's weight.

3.2.2.2. Communicative patterns

In human medicine, patterns of communication between patient and physician have been identified and used to create theoretical models based on the authoritative figure during a consultation, the importance placed on the patients value and the role of the physician (Emanuel and Emanuel, 1992; Shaw et al., 2006). Research done by Shaw et al. (2006) shows that these theoretical models can be extrapolated to veterinary-client communication. Three models have been formulated to describe patient-physician communication: the paternalist model, the consumerist model and the relationship centered model. In the **paternalist model** the physician is an

authoritative figure that provides the patient with health care by using mainly his skills. The physician assumes the patient shares the same values as he or she does and plans intervention accordingly. He or she takes on the role of "guardian" over the patient (Emanuel and Emanuel, 1992; Shaw et al., 2006). In the **consumerist model** the physician provides all information needed for the patient to choose an intervention that the patient himself sees most fit. The values of the physician are of no importance in this communication pattern, for he or she only serves as a source of information for the patient. The consumerist model was found to be of insignificance in veterinary medicine (Shaw et al., 2006). The **relationship centered model** is based on a balance of power, in which both the values of the physician and the patient are used to create a 'joint venture' as Shaw et al. (2006) called it. The physician takes on the role of counselor in this model. The use of a relationship centered model when communicating with patients has positive effects on patient and physician satisfaction, patient health, reduces malpractice complaints and increases therapy compliance (Gerrard, 2015; Shaw et al., 2006). Good use of the relationship-centered approach would, for example, be teaching pet owners to correctly perform a body condition score on their pet (Churchill and Ward, 2016).

In practice, physician-patient communication is based on the ratio of 'biomedical content', the content that purely focusses on the medical condition, and the 'psychosocial content', related to lifestyle and mental health. The ratio is decided by three components: the content of the questions asked by the physician, the information those questions convey to the patient by themselves, and the entirety of verbal and non-verbal communication used by the physician throughout the consultation (Shaw et al., 2006). This ratio presents three practical models that parallel the three theoretical models for physician-patient communication. A purely biomedical pattern reflects a paternalist pattern of communication. A consumerist patterns reflects the consumerism pattern of communication. And a biopsychosocial-psychosocial patterns reflects a relationship-centered pattern of communication. It can be assumed that these models can be used to describe communication between veterinarian and client as well (Shaw et al., 2006; Cornell and Kopcha, 2007). Using the right model to convey the message will benefit owner education and owner compliance, and thus result in improved patient care, owner satisfaction and veterinarian satisfaction.

Which model is mostly used is dependent on several factors. Firstly, during preventive appointments, such as routine vaccinations, the veterinarian is more prone to use a biopsycho-psychosocial pattern, while during a medical problem consultation, such as a case of epilepsy, they preferably resort to a biomedical pattern. Secondly, gender plays a role. When veterinarian and client are of the same sex, a biopsycho-psychosocial pattern is used more often, while if veterinarian and client are of opposite sex, a biomedical pattern is used more frequently (Shaw et al., 2006; Cornell and Kopcha, 2007). Although the relationship-centered pattern is optimal in many cases, clients might prefer, and specific medical situations might need, a more biomedical approach and it is up to the veterinarian to distinguish in each individual case, which pattern can be used best (Cornell and Kopcha, 2007). But not only the veterinarian needs to be aware of his manner of communicating with the clients. Efficient client communication has been proven to be a "team effort" when it comes to creating a weight loss plan. Consistency in the information given by all staff members and basic knowledge on prescribed diets and the therapeutic plan set by the veterinarian are important to communicate with clients about their pets individual weight loss plan (Churchill and Ward, 2016).

Besides the communicative style, using open ended questions provides the

veterinarian with more information (Gerrard, 2015). However, research shows veterinarians do the opposite (Coe et al., 2008; Churchill and Ward, 2016).

3.2.2.3. The transtheoretical model

Considering the right moment to discuss a weight loss program with a client will create better adherence and therefore better chance of therapy success (Churchill, 2010; Churchill and Ward, 2016).

Assessing 'readiness for change', as Churchill and Ward (2016) calls it, can be explained by the transtheoretical model. This model explains different stages that can describe the proces of behavioral changes concerning health, in people (Prochaska and Velicer, 1997).

The first stage is **precontemplation**, where clients are considered not to take action in the coming six months. Frequent monitoring and providing an opening for follow-up of any co-morbid disease can lead these clients into the next phase (Prochaska and Velicer, 1997; Churchill and Ward, 2016). The second phase is **contemplation** in which the client debates between the positive and negative effects of starting a weight loss program. In this phase it is considered important to provide information on the risks of obesity (Prochaska and Velicer, 1997; Churchill and Ward, 2016). Thirdly, in the **preparation phase** the client plans to begin the weight loss program within a month. In this phase it is advised to provide information on what the client may need to change his behavior even further in the right direction and start the weight loss program (Prochaska and Velicer, 1997; Churchill and Ward, 2016). The fourth phase is the **action phase**. In this phase the client has taken action to change and is actively reducing the weight for his or her pet. Creating an individual weight loss plan, suited for both the patient and the client, will help in achieving healthy and long lasting weight loss (Prochaska and Velicer, 1997; Churchill and Ward, 2016). The fifth and final stage, as discussed by Churchill and Ward (2016) is the **maintenance phase**, in which therapy failure by relapse is prevented. Prochaska and Velicer (1997) discuss a sixth stage, as the **termination stage**, in which the patient no longer has the temptation to resort to past, unhealthy, temptations. Following this model, overweight or obesity is not ignored in any stage, but veterinary action differs.

Obese pets accompanied by obese clients can be especially difficult, for fear of insulting the client (Churchill and Ward., 2016). Obese dogs are more often accompanied by obese owners, than normal weight dogs are, so in light of reducing obesity prevalence, these type of clients cannot be ignored (Kienzle et al., 1998). Churchill and Ward (2016) state that placing the focus of the consultation on negative side effects of obesity, rather than a specific weight for the pet, might help the cause without being prompt about the pet's condition.

3.3. Diagnosing pet obesity

A complete patient work up should rule out diseases that can contribute to weight gain, as well as co-morbid disease already present (Linder and Mueller, 2014; Linder and Parker, 2016). This includes a complete patient history, including nutritional assessment, and will give the veterinarian further information on how owners relate to both their pet and their feeding regimes, which can help in setting up an individualized weight reduction strategy (Churchill and Ward, 2016). Estimating an ideal or target weight is crucial in setting up a weight loss plan. It is used for calculating the caloric intake needed to achieve weight loss, estimating the duration of the treatment and providing owner as well as veterinarian with a goal (German et al., 2009).

3.3.1. Qualitative methods

Qualitative methods to diagnose obesity are X-ray and ultrasound. Ultrasound can, in

combination with morphometric measurements, help in predicting body fat percentage (Toll et al., 2002). However, less time consuming and less expensive methods are available to quantify the excess of body mass at the same time as qualifying it. In light of owner education, these diagnostic methods should however, be kept in mind (Toll et al., 2002).

3.3.2. Quantitative methods

Quantitative methods give an estimation of the extend to which the patient is overweight. Dual-energy X-ray absorptiometry, DEXA, is a non-invasive technique that measures body composition with great precision by differentiating between different types of tissue the body is made up of by use of X-ray. The deuterium oxide, D2O, dilution technique gives an accurate calculation of the fat-free mass of a patient by measuring his total body water. However, the use of these methods in clinical circumstances is impractical (Mawby et al., 2004; Witzel et al., 2014).

In a clinical setting, quantifying the excess of body mass can either be done by weight scaling, the use of a body condition score, muscle condition score and body fat index, and morphometrical measurements. The use of a **weighing scale** for determining ideal body weight is a simple method in which the target or ideal body weight is set a certain percentage lower than the weight at the start of the weight loss program. However, underestimation of the weight loss needed to get back to a healthy weight leads to overestimating the caloric intake needed for weight loss and therapy failure (Butterwick and Markwell, 1996; German et al., 2009). The weight at onset of adulthood can also be used as an estimation of ideal body weight in cats and dogs, if this was considered to be optimal body weight (Toll et al., 2002). The ideal weight can also be determined using set standards for optimal weight within a certain breed. However, published standards do not take individual variations in account, and may therefor be faulty in determining ideal body weight (Toll et al., 2002).

Morphometrical methods are measurements of the patients form, in relation to its body composition (German, 2006). Morphometrical methods include tape measurements and the body condition score. The **tape measurement method** gives an estimation of body fat percentage by making a calculation taking into account the height of the animal at the shoulder and the pelvic circumference. Tape measurements can be used to calculate the body fat percentage via gender specific formulas or via the Body Mass Index, BMI. The body fat percentage obtained after BMI calculations showed lower correlation to the body fat percentage obtained with DEXA, than the gender-specific formulas did (Mawby et al., 2004). The pitfalls of morphometric methods are incorrect interpretation of variations in body types and unaccountability of interspecies variation on fat deposition or variables such as coat thickness, operator variability and patient restraint (Toll et al., 2002; Witzel et al., 2014).

A **body condition score**, BCS, can be used to assess the animal's body fat (Linder and Mueller, 2014; Toll et al., 2002). It is a subjective scoring system ranging from 1 to 9 ideally, as this range correlates most closely to weight calculated by the DEXA method (Mawby et al., 2004). The BCS for dogs and cats are shown in figure 1 and 2 respectively. An ideal BCS of 4 or 5, represents a body fat percentage of 11%. Each increase or decrease of the BCS with one, correlates with an increase or decrease in body fat percentage of 8,7% to 15% (Mawby et al., 2004; German et al, 2009; Linder and Mueller, 2014). The BCS is considered to be the most applicable method to diagnose obesity in a clinical setting (Linder and Mueller, 2014), and should be performed during every visit to the veterinary clinic as part of the fifth vital assessment as drafted by the WSAVA[1]. Together with the BCS, a **muscle**

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[1] http://petnutritionalliance.org/site/pnatool/patient-assessment/ (May 3rd, 2018)

Figure 1: Body Condition Score Dog
From: http://www.wsava.org/sites/default/files/
Body%20condition%20score%20chart%20dogs.pdf (May 3rd, 2018)
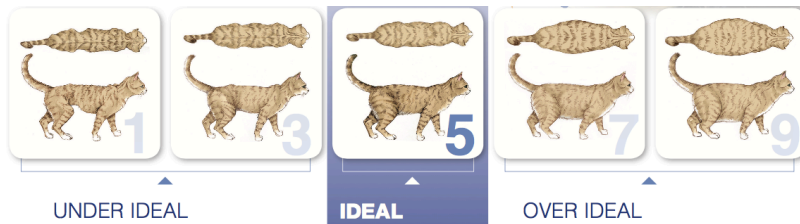
Figure 2: Body Condition Score Cat
From: http://www.wsava.org/sites/default/files/
Body%20condition%20score%20chart%20cats.pdf (May 3rd,
2018)

condition score, MCS, should be assessed, for weight loss is supposed to originate from loss of fat mass, and minimal loss of muscle mass (Linder and Mueller, 2014).

Although the BCS can be sufficient in quantifying the excess body mass and thereby the ideal weight in overweight patients, it will not suffice in patients with a body fat percentage that exceeds 40% (Toll et al., 2002; Witzel et al., 2014). Additional to defining a BCS and MCS, assigning the patient a **body fat index**, BFI, can help quantify the excess fat

Figure 3: Body Fat Index Dog
From: https://albertnorthvetclinic.wordpress.com/2013/06/12/body-fat-index-what-does-that-mean/ (May 3rd, 2018)

Figure 4: Body Fat Index Cat
From: https://albertnorthvetclinic.wordpress.com/2013/06/12/body-fat-index-what-does-that-mean/ (May 3rd, 2018)

14

mass more accurately in patients with body fat percentages up to 65%, leading to a more accurate maximum caloric intake needed for weight loss (Toll et al., 2002; Witzel et al., 2014). The BFI can be assessed by visual assessment and palpation, as can be done with the BCS and is shown in figure 3 and 4 (Witzel et al., 2014).

3.4. Curative treatment

The goal of any therapeutic regime for combatting pet obesity is long term weight loss that is obtained in a healthy manner. The success of t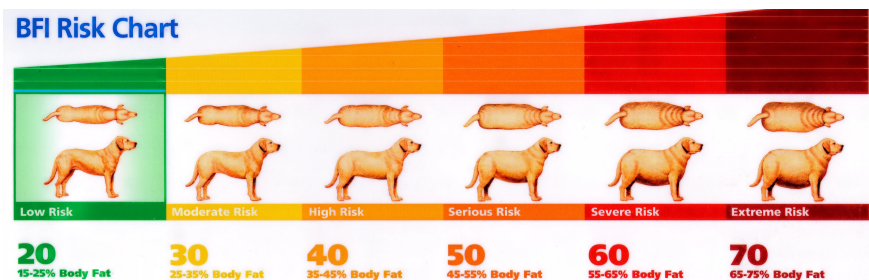he implemented treatment is dependent on several factors. Firstly, an individualized weight loss program, that focusses on restriction on energy intake and increased energy outlet, is essential (Gosselin et al., 2007; Wakshlag et al., 2012; Churchill and Ward, 2016). Secondly, owner commitment to the proposed therapy is vital for the survival of any therapeutic plan. Owners are more willing to perform dietary changes, than change exercise regime or treat-giving (Bland et al., 2013). Nutritional guidance can therefor be considered as a starting point for increasing owner compliance to any proposed therapy, from whereon the plan can be complemented with necessary, but achievable, options. And thirdly, regular contact with the supervising veterinarian increases the success of a weight loss plan (Wakshlag et al., 2012; Churchill and Ward, 2016). Furthermore, authors report the use of pharmaceutical drugs as an option when installing a weight loss program (German en et., 2009).

3.4.1. Nutritional support

A thorough dietary history includes the type (dry, semi-moist, moist), brand, amount, and frequency of maintenance food, treats given, food used to give medication and food supplements (Linder and Parker, 2016). Getting a full dietary history also provides the veterinarian with, as Linder and Parker (2016) call them, the 'Non-negotiables'. This is the food that the owner is reluctant to leave out of any proposed plan. Client compliance will improve when working with the owner and incorporating these 'Non-negotiables' into your plan (Linder and Parker, 2016). This can be done by decreasing the caloric intake of maintenance food to balance the caloric intake generated by the feeding of snacks. However, the caloric percentage of snack feeding should not lead to a decrease of maintenance food in such quantities, that essential nutrients are in danger of becoming deficient. Snack feeding can best be limited to 10% of caloric intake (Becvarova, 2011; Laflamme, 2012).

3.4.1.1. Weight loss diets

Most owners are reluctant to use specially designed weight loss diets. However, using a commercial maintenance pet food for weight loss programs entails risks. In cases where 5-10% weight loss is indicated, veterinarians can turn to non-therapeutic diets to achieve caloric restrictions, without expecting problems (Becvarova, 2011). But when more weight loss is indicated, energy restriction with a maintenance diet will lead to deficiencies in other essential nutritional compounds (Diez et al., 2002; Toll et al., 2002). Besides the amount of weight loss, species, gender and level of activity must be considered, before an effective diet is chosen. More active dogs are able to have higher caloric intakes while still achieving weight loss, in comparison to less active dogs (Vitger et al., 2016).

Energy restriction can be achieved by decreasing the fat content of a food (Borne et al., 1996; Laflamme, 2006). Fat contributes the most to metabolizing energy of a food. Decreasing fat content, therefor has the most effect on the energy density of a food. Especially foods low in fat and high in fibre seem to have significant effect on weight loss in dogs (Laflamme, 2006). Linder and Parker (2016) warn about commercial weight loss foods, that can sometimes be considered low-fat when expressed in grams of fat

per calorie, but provide more calories per kg food than is needed to achieve weight loss. Reduction of fat content in dogs allows up till 9% fat on a dry matter basis. In cats 10% fat content on a dry matter basis is recommended as maximum, when not considering an Atkins' diets (Toll et al., 2002).

Instead of feeding energy in the form of fat, veterinarians can exert to a food higher in protein, which is preferable to preserve lean body mass (Diez et al., 2002; Vitger et al., 2016). By slowing down the weight loss process over a longer period, preservation of lean body mass and loss of fat mass can also be achieved (Diez et al., 2002).

3.4.1.2. Satiety

Weight loss is accompanied by the decrease in leptin concentrations, which adds to the feeling of being hungry (Bastien et al., 2015; Tarkosova et al. 2016). This can lead to food-seeking behavior (Toll et al., 2002). Owners get less compliant when their pets exert to these behaviors, such as begging (Becvarova, 2011). This can be countered by increasing the satiety, which can be done in different ways. Firstly, air and water can be used, in dry and moist foods respectively. This however, only increases satiety while the food passes through the gastro-intestinal system (Toll et al., 2002). Secondly, increased fibre fraction can help to increase satiety during weight loss (Toll et al., 2002; Becvarova, 2011). Increased fibre content increases the bulk which aids in gastric distention. Gastric distention stimulates the secretion of cholecystokinin, which decreases the sensation of 'hunger' (Cheng et al., 1993; Toll et al., 2002). Fibre can also interfere with the uptake of other nutrients and thereby decrease the caloric uptake of the food (Toll et al., 2002). Other studies, are in doubt about fibre contributing to satiety levels, and seek their contribution in weight loss diets more in metabolic effects only (Gossellin et al., 2007). However, the combination of high fibre diets and high protein levels has been proven to increase satiety during weight loss and is used successfully used in many weight loss studies (Weber et al., 2007; German et al., 2015; Flanagan et al., 2017). For weight loss diets fibre content is advised to be between 12-25% on a dry matter basis for dogs and 15-20% on a dry matter basis for cats (Toll et al., 2002). Besides the influence on satiety, fibre also offers other nutritional benefits. It aids in diluting the energy density of the food and decreases insulin secretion (Borne et al., 1996). When prescribing a diet high in fibre, the owner should be informed about the increase in stool volume that can be expected and is a negative side effect of this kind of diet (Toll et al., 2002; Gosselin et al., 2007).

3.4.2. Exercise regimes

3.4.2.1. Current perspectives on exercise

Exercise has long been a beneficial routine component in weight loss programs in humans. Recently, research has shown that exercise is a very beneficial component in canine weight loss programs as well (Roudebush et al., 2008; Morrison et al., 2013; Vitger et al., 2016). More intensive exercise regimes can lead to more weight loss than caloric restriction alone, even if the exercise regime consists of a mild fitness program. However, owners have the tendency to overestimate their exercise regime, which makes it harder to convince them to undertake more rigorous action in order to achieve proper weight loss (Frye et al., 2016).

Exercise in cats may be less conventional than it is in dogs. However, also cats that are less exercised by their owner are at higher risk of developing obesity (Roudebush et al., 2008). Studies on therapeutic exercise for feline obesity have not been done yet.

3.4.2.2. Positive effects

Exercise increases the energy expenditure of the animal, while preserving lean body

mass. This benefits weight loss, because preservation of lean body mass enables the animal to restore to full muscle function. Also, preservation of muscle requires more energy than preservation of fat does, which makes it easier to maintain the achieved weight loss (Wakshlag et al., 2012; Vitger et al., 2016). Furthermore, exercise has been proven to increase insulin sensitivity and partially reverse leptin resistance (Roudebush et al., 2008). Therefor it can help reverse comorbid disease, while at the same time decrease the sensation of hunger for the animal. Exercise also helps to reduce the status of chronic low grade inflammation, that obesity causes (Vitger et al., 2017). All these improvements can already be noticed when exercise is implemented into the regime of the pet, without it having lost weight yet (Roudebush et al., 2008). Thus exercise, in any obese pet without orthopedic co-morbidities, is beneficial to include in therapeutic regimes, even if there is a slim chance of actual weight loss. Lastly, controlled exercise, such as regular treadmill sessions, can increase the rate of weight loss (Chauvet et al., 2011). Although crash-dieting should be avoided, mild increase in the rate of weight loss, by means of regular exercise, can be an incentive for the owner to comply with the therapy, as results are more prominent more quickly. Furthermore, exercise can aid in the prevention of obesity and can be considered for prevention of relaps and long term therapy success (Robertson, 2003; Roudebush et al., 2008; Frye et al., 2016).

Exercise can be beneficial if done moderately and regularly. However, the definition of moderate, regular exercise is not defined by Roudebush et al. (2008) and is open for personal interpretation and dependent on the patient. Studies done by Diez et al. (2002) implemented at least 20 minutes of exercise per day to prevent loss of lean mass during their weight loss program. The exact duration of exercise needed to achieve weight loss is unknown (Vitger et al., 2016). Besides the duration, also the intensity of exercise needed for healthy weight loss is unknown. Robertson (2003) found that the intensity of exercise had no significant influence on a dog becoming obese. If this can be extrapolated to curative weight loss in an obese pet has yet to be investigated.

3.4.2.3. Negative effects

Although many benefits can be stated for exercise, the owner should be guided to implement this into the routine in a healthy manner. Safety and animal welfare should always be guarded and overheating due to exercise is a risk that should be avoided (Frye et al., 2016).

3.4.3. Psychological aspect

Obesity is often found to be a difficult problem to tackle, for if often includes the need for serious change in the owners behavior towards their pet (Churchill and Ward, 2016). Communication is key to better compliance rates and the increase in health care that comes with it (Bonvicini and Abood, 2006; Lue et al., 2008; Gerrard, 2015). The principles of owner education (see §3.2.2) are essential to achieve this. The first 'stage' of a clients willingness to change can be considered 'acceptance' of the problem at hand. Churchill and Ward (2016) found that acceptance can best be told by the veterinary interviewing skills and the quality of veterinarian-client interaction. The 'stages of change' model (see §3.2.2.3) can help by determining if the owner is ready to start the process of weight management. One must bare in mind that dog and cat owners have different life styles, which asks for a different approach to combatting pet obesity. Dog owners are generally more aware of their pets weight problem than cat owners are. Especially cat owners with overweight cats have difficulty acknowledging their pets health issues (Kienzle and

Berglery, 2006).

The owner can be educated on different aspects of weight management. For instance determining correct BCS for the patient, which owners often have difficulty doing (Toll et al., 2002; Colliard et al., 2006; Kienzle and Berglery, 2006). Also positive side effects of weight loss can be discussed, such as improvement in insulin resistance in dogs, and decrease in clinical lameness in dogs with osteoarthritis (Impellizeri et al., 2000; German et al, 2009). It is also worth mentioning that dietary restriction can increase median life span (Kealy et al., 2002). Besides major health benefits, behavioral alterations that have been studied in cats, including increased purring and sitting on the owners lap more often after weight loss, can aid in owner persuasion (Levine et al., 2016). Besides mentioning positive effects weight loss can provide, the owner should be informed of negative effects certain therapeutic measures can give, such as increased volume of faeces and increased flatus (Toll et al., 2002; Gosselin et al., 2007). Serious adjustments on the owners account could include using play as a treat instead of food (Kienzle and Berglery, 2006).

3.5. Principles of therapy compliance

3.5.1. What is therapy compliance?

Therapy compliance is an essential part of the therapy implemented by veterinarians, as therapy success is determined by the willingness of the pet owner to follow veterinary recommendations. Compliance is described by the 2009 American Animal Hospital Association, AAHA, report as 'the percentage of pets receiving a treatment, screening, or procedure in accordance with accepted veterinary health-care recommendations', whereas adherence is described as 'the extend to which clients administer medications prescribed and completing the prescribed course'. As this dissertation covers the complete management of obesity, the term compliance will be used.

Owners are generally more compliant when they have a strong relationship with their pets. Compliance also increases when the vet-client relationship is stronger (Lue et al., 2008). This relationship is subject to communication, pet handling and owner education (Gerrard, 2015, Churchill and Ward, 2016). Results from the 'AAHA compliance report' (2009) point out that non-compliance more often stems from lack of advise or lack of conveying the importance of a certain therapy, than it is a result of high costs.

3.5.2. Causes for low therapy compliance

Veterinary teams often see compliance as a given when recommending certain procedures, and often place the responsibility for non-compliance with the client. However, clients express the need for more elaborate explanation about procedures and their importance, and require more intensive follow up, hereby expressing that it is more the veterinary team's responsibility to make them more compliant (AAHA press, 2003).

Although veterinary studies on the causes of low or non-compliance are absent, human studies give the primal reasons for lack in compliance:

- patient psychological factors

- lack of patient understanding of the importance of following therapy

- length of therapy and costs

- dysfunctional communication between physician and patient.

Direct extrapolation to veterinary medicine is not possible, as our patients are controlled by their owners. However, many similarities can be drawn between the way veterinary and

human medicine are practiced. In human medicine, increase in compliance is attempted in different ways:

- **Technical**: simplifying the therapeutic regimen, so patients have to do as little as possible by themselves.

- **Behavioral**: providing a reward for desired behavior.

- **Educational**: using handouts.

3.5.3. How to improve therapy compliance?

Table 6 shows different factors associated with compliance. Improving compliance in aspects of obesity management where veterinarians lose most of the compliance in the first place, can prove efficient. In general, good use of communication can increase client

	Factors Strongly Correlated with Adherence	Factors Slightly Correlated with Adherence	Factors Not Correlated with Adherence
Out of practice's control*	Species (dog owners reported higher adherence) No young children at home Experience of the pet owner	Weight of dogs Tenure at practice Condition Shared responsibility	Age of pet Consulting the Internet Pet owner gender Socioeconomic status Recheck appointments Cost of medication
Communication-related	Communication (overall) Written information Frequency of visits to veterinarian Veterinarian continuity	Length of visit Demonstration Multiple explanations Follow-up call from veterinarian Chronic refill reminders	
Other	Formulation of medication	Place of purchase	

Figure 6: 'Factors Correlated with Adherence' from: AAHA report, 2009

compliance by 40% (Bonvicini and Abood, 2006; Lue et al., 2008; Gerrard, 2015). Besides the principles for proper owner education, as discussed in §3.2.2, other communication skills can be used to increase client compliance. '**Reflective listening**' can be done by providing a short summary of the clients story to the client, by giving an interpretation of what the client has told the veterinarian or by testing a hypothesis the veterinarian has formulated by means of the clients information (Bonvicini and Abood, 2006; Gerrard, 2015). **Expressing empathy** and correct use of **body language** supports the message the veterinarian is trying to convey (Bonvicini and Abood, 2006; Gerrard, 2015). Client education should be clear and bond, for overwhelming the client with information has the opposite effect. Making an effort to increase client understanding of the problem and what can be done about it, for example by **providing written information** for the client to take home can increase compliance also (Bonvicini and Abood, 2006). For weight loss programs in particular, veterinary publications recommend the following:

- Provide the client with measuring instruments for the prescribed diet, and additionally a BCS chart, as well as written information (Bonvicini and Abood, 2006; AAHA report, 2009)

19

- Make the clinic scale available between rechecks (Becvarova, 2011)

- Provide financial rewards for success: installing discounts on procedures for healthy-weighing pets.

- Follow up on the patient: either by appointments in the clinic or by phone (Levy et al., 2007).

- Set realistic goals: weight loss of 0,5-2%/week is desirable (Becvarova, 2011)

- Take 'before' and 'after' photographs

When a team effort is made to increase overall client compliance, it will lead to higher quality of care, that does not necessarily involve high costs (AAHA report, 2009).
Furthermore, pet owners recommend consultations that take longer than 10 minutes and continuity with the veterinarian with every visit to increase client compliance (AHAA report 2009; Gerrard, 2015).

3.6. Evaluation

Proper evaluation is essential to any successful weight loss plan (Laflamme, 2006; Laflamme, 2012; German, 2016). This ensures the implemented weight loss regime is healthy for the individual pet, and can allow for therapy to be redirected if it is not giving the desired results, decreasing the risk for client dissatisfaction (Churchill and Ward, 2016). In the beginning, supervision for a healthy weight loss trend should be done by follow-up visits every 2 weeks (Becvarova, 2011; Churchill and Ward, 2016). Preferably weight loss is followed up using the same scale. In-clinic weight check are thus preferred to at home follow up in the beginning. Hereafter, monthly follow up visits should suffice to continue healthy weight loss (Becvarova, 2011).

3.7. Therapy success

The success of an implemented therapy can be relative according to personal opinion about what success entails. Successful weight loss can be defined by the numeric loss of kilograms, or a percentage of weekly weight loss that should be achieved (Becvarova, 2011). However, according to some authors, success is better measured by the decrease in co-morbid disease prevalence and a healthy pet (Churchill et al., 2016). Also reducing the risk alone of co-morbid disease, or improvement in clinical symptoms of co-morbid disease can be considered a success (German et al., 2009). Therefor, therapy success is considered to be a very personal concept, for the veterinarian as well as the owner.

4. Research question

   4.1. Research question
   The general aim of this survey was to investigate how obesity is managed within the small animal clinics in Belgium and the Netherlands and which factors can be improved in order to decrease prevalence and improve treatment of this severe condition in cats and dogs. Therapy success rates were compared to other survey questions to investigate if certain behavioral patterns had more or less effect on therapy success.

   4.2. Hypothesis
   The hypothesis of this study is that an active attitude in combatting obesity in companion animals is expected to lead to greater therapy success. An active attitudes includes acknowledging personal responsibility within obesity management, following the current consensus on diagnostics and therapy and applying communication guidelines as described in the above introductory literature study.

5. Materials and method

    For this dissertation, a format for limited research was chosen. A survey was chosen as research method, to investigate the pattern small animal veterinarians use when managing patients with obesity and their owners. The aim was to get a broad view of the current practice of obesity management by questioning the following aspects:

    - Introductory questions on specific characteristics of the respondent

    - Presumed causes of obesity

    - Diagnostic methods and estimated prevalence

    - Curative therapy for obesity

    - Communication with the owner both when addressing obesity as well as communication when following up on a certain patient.

    - Therapy success and failure

    The survey was made up of 53 questions, of which 7 introductory questions, 6 team-related questions, 10 questions on presumed causes and diagnostics, 12 questions on implementing a treatment plan, 8 questions on communication and 10 questions on therapy success and follow up. As an incentive, one free consultation about small animal nutrition, was raffled amongst the participating veterinarians.

    A dutch version was made by the author and translated into a French version by Home Office. A copy of the survey was included as appendix 1.

    The survey was made in SurveyMonkey and distributed via Facebook pages of veterinary associations (Vlaams Dierenartsen Vereniging, Intérêts des vétérinaires Dierenartsen Belangen, IVDB, Small Animal Veterinary Association Belgium, Het Dierenartsengilde, Caring Vets, NeoAnimalia Vettube and Union Proffesionnelle Vétérinaire). Distribution via social media was chosen to keep the costs as low as possible, while gaining high responses at the same time. Additionally, the survey was distributed via a website (IVDB) and a mailing list ('Dierenartsen Kring Den Haag', an arrangement for veterinary emergency services in The Hague, the Netherlands).

    The Dutch survey aired on facebook on December 13th 2017 and was send by mail on december 15th. The French survey aired on facebook on december 14th. The survey was online for three weeks, after which a reminder was send. The application was then open for another three weeks and closed after a total of six weeks.

    In order to get fair results, the option 'multiple responses', that enable people to respond multiple times from the same device, was turned off, as was the option 'response editing', which enables responders to alter their answers after leaving the survey page. In order to avoid responders in the same clinic to alter answers in order for a certain outcome to result, the option 'instant result' was also turned off. Instead, responders could enter their e-mail address and notify the author of their interest in the results.

    Survey responses were excluded from the study when:

    1. < 25% of the survey questions answered

    2. There was no respons to the questions on therapy success.

    After exclusion criteria were set, a description of the survey respondents was made. Respondents were classified according to their gender, graduation year, current working position and their continuing education in the field of nutrition and communication.

    The data analysis resumed with description of therapeutic success ranges according to survey data. Specific perspectives on therapy success, or lack of it, and its' causes were described accordingly. Subsequently, the rest of the data was first described, before links between the different parts of

the survey were made. Correlations were made using IBM SPSS Statistics 25. P-values were calculated with a two-tailed test, with significance being at the 0.05 level. A one-way ANOVA test was used to compare continuous with non-continuous data.

6. Results

The survey got a total of 101 responses. 72 responses were gained from the Dutch survey. 29 responses were gained from the French survey. 13 responses were excluded because less than 25% of the survey was completed. 23 responses were excluded because questions regarding therapy success were not answered. This left a total of n=65 to be used in the study.

The survey was completed by 12 male veterinarians and 52 female veterinarians. Respondents graduated between the years 1985 and 2017, with an average of 2010 as graduation year. Graduation year showed weak negative correlation to therapy succes (r=-0.08), that was not significant (p=0.50). Gender did not significantly influence therapy success either (F=0.01, p=0.94), nor did current occupation (F=0.27, p=0.77). Of the Francophone veterinarians all graduated in Belgium, of which 4 are still working in Belgium, 7 in France and 6 did not answer.

The current working positions are presented in table 2 and do not influence mean therapy success

Table 2: current working position of veterinarians

Occupation	Respondents (%)	Mean therapy success (%)
Owner	32,3%	29.6% (+/-17.6)
Associate	6,2%	36.6% (+/-11,5)
Employee	60,0%	31.6% (+/-18.9)

Table 3: available clinical staff in veterinary clinics

	0	1	2	3	4	5-10	>10
Veterinarians	N/A	18,5%	26,2%	13,9%	10,8%	18,5%	12,3%
Assisting staff members	32,3%	4,6%	18,5%	9,2%	9,2%	15,4%	10,8%

significantly. Table 3 shows the amount of staff present in the clinic respondents are currently working in. The number of veterinarians showed negative correlation to mean therapy success (r=-0.21, p=0.09), as did the number of assisting staff (r=-0.10, p=0.43), though neither were significant. Within the obesity management protocol, assistants have been given the task of taking a detailed anamnesis in 39.8% (+/- 24.6) of the cases on average, which is positively correlated to therapy success (r=0.042), but without significance (p=0.79). Weighing the patient is delegated to assisting staff in 81.3% (+/- 24.2) of the cases on average, which is also positively correlated to therapy success (r=0.11), without significance (p=0.50). Assistants make up the BCS in 40.9% (+/- 38.4), with r=0.04 and p=0.81, of the cases on average and create the weight loss plan, including type of diet and amount to be given of a specific diet in 39.9% (+/-32.0) of the cases on average, with r=0.16 and p=0.33. Explaining the therapy is delegated to assisting staff in 58.4% (+/- 37.4) of the cases on average, with r=0.03 and p=0.83. Follow up is done by assisting staff in 48.9% (+/- 33.6) of the cases on average, and shows a positive correlation to therapy success (r=0.31) that is significant (p=0.05).

Respondents were also asked about their current and future continuing education, regarding communication and veterinary nutrition. Data are shown in figure 2. An analysis of variance for both the effect of continuing education about communication and nutrition on therapy success showed no significance, F=0.56, p=0.65 and F=0.27, p= 0.85 respectively.
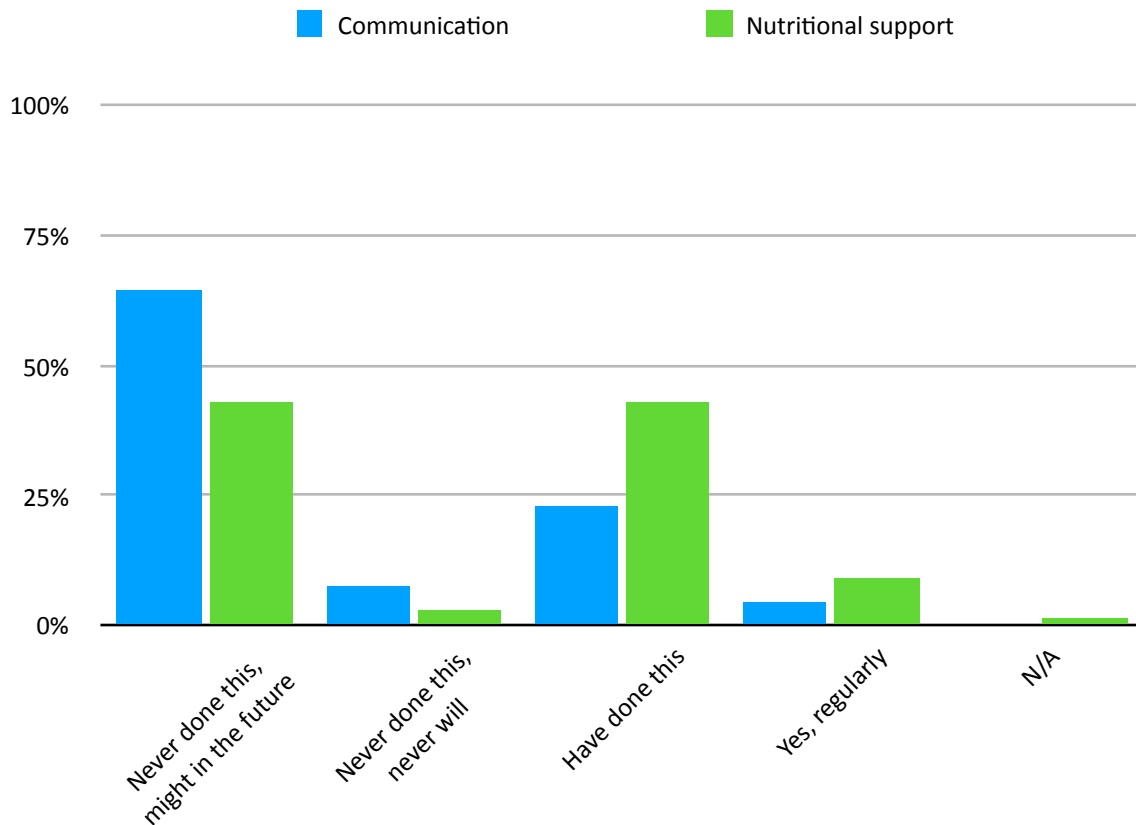
Figure 2: current opinion on doing continuing education on communication and nutritional support. The X- axis shows the options respondents could choose from. The Y-axis shows the percentage of respondents choosing that option.

6.1. Therapy success

Mean therapy success rate, estimated by veterinarians was on average 31.4% (+/- 17.8) but slightly differed according to the different categories. For overweight dogs, therapy success estimations on average were 39.1% (+/- 20.2). For obese dogs, therapy success on average was 35.2% (+/-22.8). For overweight cats, veterinarians estimate a success rate of 28.2% (+/- 18.0). Veterinarians estimated their therapeutic success in feline obesity on 22.9% (+/- 17.1) on

Table 4: "What do you consider to be the main cause for therapy failure?"

Main cause for therapy failure	Respondents (%)	Mean therapy success (%)
Owner related causes	87,7%	30.2% (+/-17.7)
Animal related causes	3,1%	51.4% (+/-15.0)
To little preventive action	6,2%	36.9% (+/-22.1)
N/A	3,1%	

average. Presumed causes for therapy failure are shown in table 4, the effect thereof on therapy success showed no significance (F=1.57, p=0.22). Personal definitions on therapy success and failure are shown in table 5 and 6. An analysis of variance showed that the effect of veterinary action taken after therapy failure (table 6) on therapy success was significant (F(2.71), with p=0.04). This was not the case for data from table 5 (F=0.96, p=0,44). Vets were also asked if rebound after therapy success, could still fall under their definition of therapy success, which on average 62.6% (+/-32.0) disagreed with. For 65.8% (+/-34.0) only long term

25

weight loss was considered therapy success. Respondents would not discuss the weight of an animal anymore, after therapy failure in 19.6% (+/-25.9) of the cases on average.

Table 5: Is the following statement applicable to patients you have treated for overweight or obesity?: "If weight loss is limited, I can still think of the therapy as successful."

"I can still view limited weight loss, as therapy success"	Respondents (%)	Mean therapy success (%)
Yes, I can see weight loss of any range as a success.	30,8%	26.0% (+/-16.8)
Yes, but only if the weight loss is long lasting. (no rebound).	41,5%	31.5% (+/-16.6)
Yes, but only if the weight loss comes with a decrease of comorbid disease or its intensity.	15,4%	34.9% (+/-24.1)
No, therapy succes is only achieved when the target weight is reached (when this is different from ideal weight).	7,7%	37.7% (+/-14.7)
No, therapy succes is only achieved when the ideal weight has been reached.	3,1%	44.3% (+/-20.2)
N/A	1,5%	

Table 6: When reaching for ideal weight does not seem achievable…:

When reaching for ideal weight does not seem achievable…:	Respondents (%)	Mean therapy success (%)
I can see the weight loss that has been achieved as a succes for the implemented treatment.	38,5%	30.2% (+/-17.2)
The therapy has failed and we will try again later.	7,7%	40.9% (+/-11.7)
The therapy has failed and we will try again with a different approach.	41,5%	35.4% (+/-18.6)
The therapy has failed, and I won't discuss the patients weight in the future.	7,7%	11.6% (+/-10.5)
The therapy has failed and I will refer the patient, if the client is open to this.	3,1%	19.5% (+/-8.8)
N/A	1,5%	

6.2. Causes and diagnostics

The presumed primary causes for canine and feline obesity according to respondents are shown in table 7 and showed no significant effect on mean therapy success in dogs (F=0.05, p=0.82) or cats (F=0.09, p=0.92). Estimated prevalence of overweight, BCS 6-7/9, in respondents' clinics was on average 41.4% (+/- 19.8), with a minimum value of 5% and a maximum value of 85%. Clinical prevalence of obesity, BCS 8-9/9, was estimated to be 12.5% on average (+/- 10.9), with a minimum of 2% and a maximum of 70%. Weight is discussed in 48.2% (+/-40.1) of patients with a BCS 5/9. When BCS increases to 7/9, overweight patients, 78.4% (+/-27.9) of the respondents discuss the weight. If the patient has a BCS of 8-9/9, obese patients, 90.0% (+/-23.7) of respondents discuss the weight. Overweight is discussed in 100% of the patients by 27 respondents and obesity is discussed in 100% of the patients by 40 respondents. Addressing overweight shows a positive correlation, though not significant, to

Table 7: presumed causes of obesity according to veterinarians (%)

Presumed primary cause	Dogs	Mean therapy success in dogs (%)	Cats	Mean therapy success in cats (%)
Owner related causes	96,9%	36.8% (+/-20.1)	83,1%	24.9% (+/-15.8)
Animal related causes	0,0%		3,1%	23.8% (+/-6.0)
To little preventive action	1,5%	50% (+/-.)	9,2%	29.2% (+/-22.7)
N/A	3,1%		4,6%	

mean therapy success (r=0.16), with p=0.21. Addressing obesity shows stronger, and significant, correlation to mean therapy success (r=0.27, p=0.03). Addressing weight in patients with a BCS 5/9 shows a weak negative correlation (r=-0.07) to mean therapy success, with no statistic significance (p=0.6). Table 8 shows the average frequencies that respondents discuss the overweight of a patient. It had no significant effect on mean therapy success (F=0.87,

Table 8: addressing obesity

"How many times do you address the overweight of a patient?"	Respondents (%)	Mean therapy success (%)
If needed, during every consultation	61,5%	33.3% (+/-15.6)
In a number of subsequent consultations. If the owner does not respond, I leave responsibility for the pets weight with the	29,2%	27.7% (+/-20.6)
During one consultation and no more if the owner does not comply.	6,2%	26.3% (+/-14.5)
N/A	3,1%	

Table 9: facilities for weight scaling (%)

Placement of the scale	Dogs	Mean therapy success in dogs (%)	Cats	Mean therapy success in cats (%)
Scale in the waiting area only	44,6%	36.4% (+/-21.2)	15,4%	31.3% (+/-22.1)
Scale in the consultation room	26,2%	36.7% (+/-18.6)	64,6%	24.8% (+/-14.7)
Scale in the consultation room and the waiting	24,6%	38.7% (+/-21.1)	16,9%	21.9% (+/-14.8)
No scale	1,5%	0% (+/-.)	0,0%	
N/A	3,1%		3,1%	

p=0.43). Respondents are tempted to ignore obesity in 14.5% (+/-15.0) of the cases, which is negatively correlated to mean therapy success (r=-0.27 with a p=0.03). The mere presence of overweight and obesity is negatively correlated with mean therapy success though without statistic significance, r=-0.14 (p=0.28) and r=-0.06 (p=0.64) respectively.

The in-clinic possibilities of weight scaling, including the placement of the scale for cats and dogs is shown in table 9 and showed no significant influence on mean therapy success (F=0.96, p=0.39 and F=0.11, p=0.95). The different methods used to diagnose pet weight are shown in figure 3 and do not influence mean therapy success significantly (F=1.04, p=0.42). Methods used for diagnosing pet obesity are shown in figure 4, and do not influence mean therapy success significantly (F=0.87, p=0.54).

Methods used for diagnosing pet weight

Figure 3: the make up of a diagnosis concerning pet weight in general. The Y-axis shows the number of responses about diagnostic methods (total n=65). The X-axis shows the different combinations of diagnostic methods used by respondents. The bars show the make up of a diagnosis. eg. The second bar: 19 respondents use weight scaling combined with BCS 5-system to evaluate a pets weight.

6.3. Therapeutic regimes

On average 59.9% (+/-29.7) of the respondents decrease the amount of commercial pet food that the pet was eating before the start of a weight loss program, whilst 58.2% (+/-29.4) of respondents on average prescribe a diet specifically indicated for weight loss. Home cooked diets created for weight loss were only recommended by 7.9% (+/-17.6) of the respondents on average. The type of diets prescribed in obesity management all showed weak positive correlation to mean therapy success, of which none were significant. Commercial weight loss

Methods used for diagnosing pet overweight
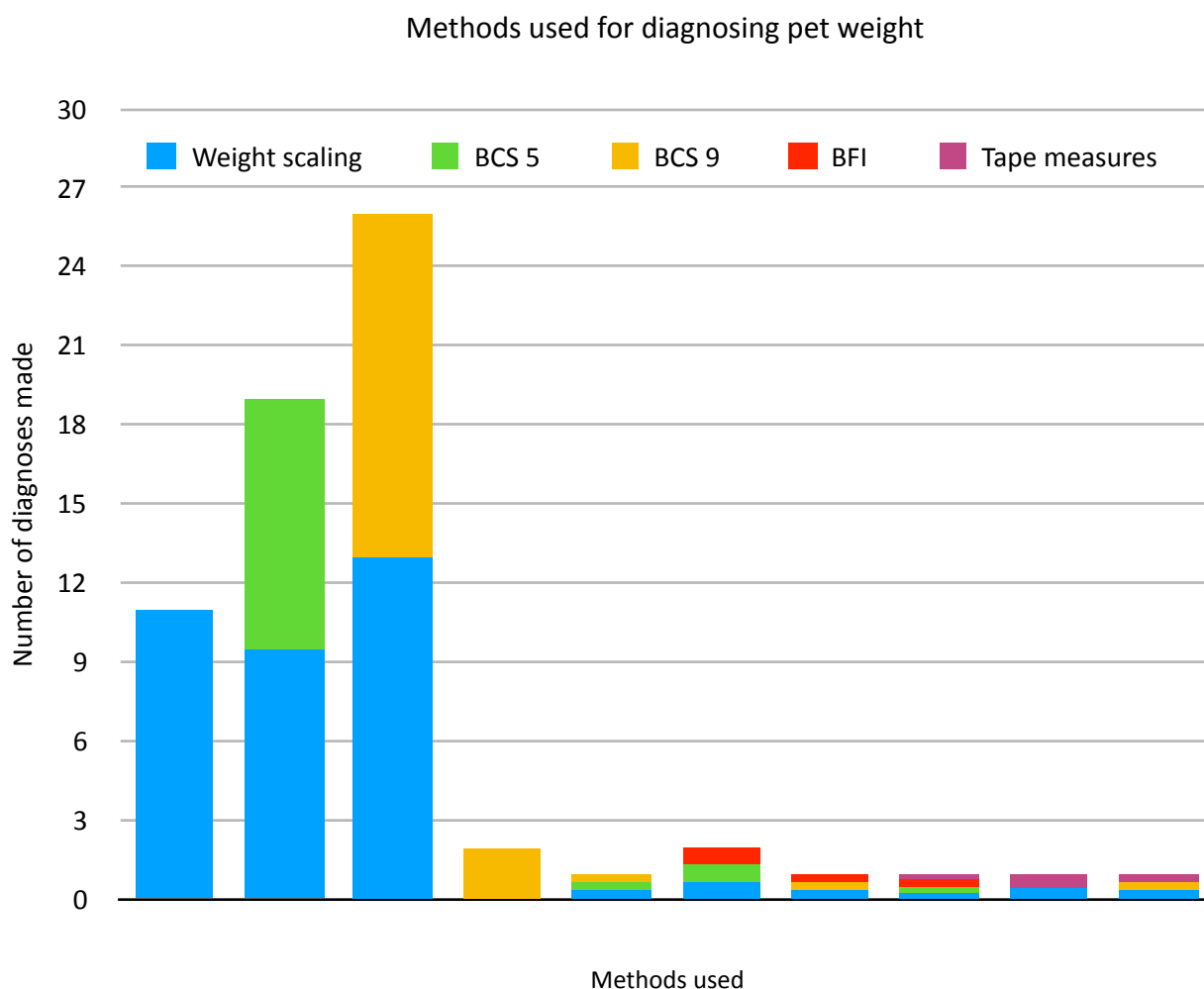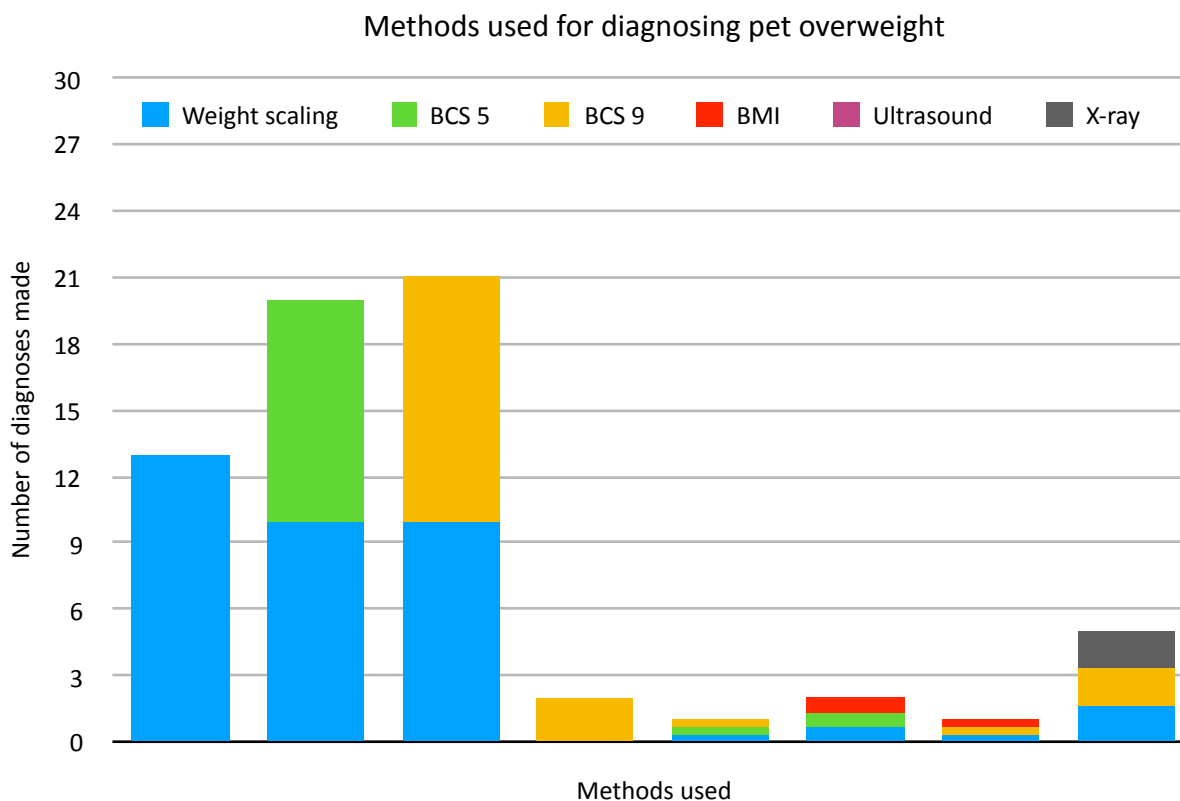

Figure 4: the make up of a diagnosis concerning pet obesity. The Y-axis shows the number of responses about diagnostic methods (total n=67). The X-axis shows the different combinations of diagnostic methods used by respondents. The bars show the make up of a diagnosis. eg. The second bar: 20 respondents use weight scaling combined with BCS 5-system to diagnose pet obesity.

diet shows stronger correlation (r=0,10 with P=0,46) than reduction of the pets maintenance food (r=0.04 with p=0.76) did. Prescribing a home cooked diet is positively correlated to mean therapy succes (r=0.07), but was also found to be not significant (p=0.62).

The daily quantity of food can be derived from the packaging of commercial pet foods, which is

Table 10: Recommendations regarding snacks

Snacks...	Respondents (%)	Mean therapy success (%)
are absolutely prohibited during the weight loss program. I am very firm on this subject.	10,8%	35.9% (+/-15.6)
are best left out of the ration during weight loss. However, I do realize many owners won't comply to this.	12,3%	29.0% (+/-15.7)
are best replaced with a caloric-poor snack, such as beans	23,1%	33.1% (+/-12.3)
are allowed to a set percentage of the daily caloric intake	7,7%	20.5% (+/-7.3)
are allowed as long as the given calories are retracted from the daily quantity of maintenance food.	41,5%	32.0% (+/-22.0)
are allowed, because it is extremely difficult to forbid	1,5%	0.0% (+/-.)
N/A	3,1%	

done bij 65.8% (+/-37.5) respondents on average, or by calculating individual caloric need, done by 30.7% (+/-38.2) of the respondents on average. Using caloric calculations to determine the amount of food indicated for weight loss was significantly, positively correlated to mean therapy success (r=0.30, p=0.02). Using the prescribed amount of food described on the packaging is negatively correlated with therapy success (r=-0.17), without significance (p=0.19). Recommendations regarding snacks are shown in table 10 and do not influence mean therapy success significantly (F=1.14, p=0.35). Next to nutritional support, 70.4% (+/-29.8) of respondents on average recommend exercise as part of the therapy in dogs, whilst in cats this is 57.0% (+/-32.4). However, in only 45.1% (+/-40.1) of canine patients on average the type of exercise is explained, and in 37.3 (+/-36.0) the duration and intensity of exercise are explained. In cats the type of exercise is explained in 39.68% (+/-39.83) of the cases on average. Recommendations about exercise in general have positive, though no significant, correlation to therapy success for dogs, r=0.16 with p= 0.22, as well as for cats, r=0.13 with p=0.30. Elaborating on the type of exercise is positively correlated to therapy success in dogs, r=0.19 with p=0.15, as well as cats, r=0.28 with p=0.03. This observation was only found to be significant in cats. Elaborating on intensity and duration of exercise in dogs is positively correlated with therapy success as well, r=0.22, but without significance (p=0.09).

6.4. Communication

Figure 5 shows the communication style that respondents feel describes themselves. The model used by respondents did not show significant influence on their mean therapy success (F=0.16, p=0.69).

Their motives for using this style, are shown in table 11. This did not influence mean therapy success significantly (F=1.82, p=0.15). On average, respondents spend 22 (+/-12.5) minutes on a consultation about pet obesity, with a min/max of 4 and 60 minutes. Respondents using a paternalist communication style for reasons of time efficiency, mostly did spend less time on
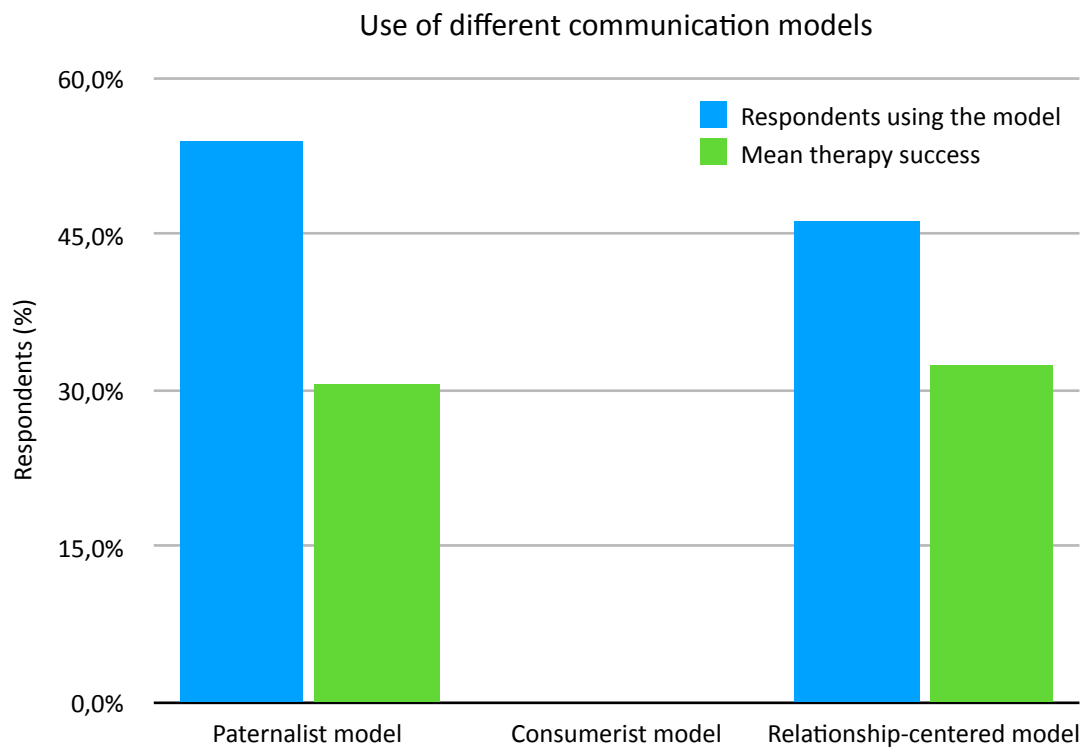

Figure 5: Use of different communication models and related mean therapy success. The X-axis shows the different communication models, respondents could choose from, with their corresponding mean therapy success. The Y- axis shows the % of respondents choosing the

Table 11: Motives of respondents for using their communication style.

Motive for using a communicative pattern	Respondents (%)	Mean therapy success (%)
This takes the least of my time	7,7%	39.3% (+/- 20.3)
This is how I gain the most valuable information	38,5%	36.3% (+/-20.8)
This is what I am most comfortable with/ This is what I am used to	32,3%	27.4% (+/-14.4)
There is no specific reason	21,5%	25.8% (+/-14.1)

an obesity consultation, on average 17 minutes. Time spent on an initial obesity appointment is positively correlated with therapy success (r=0.12), though without significance (p=0.36). Graduation year had no effect on the use of a specific communication pattern. Conveying the necessary information to clients is done as shown in table 12 and showed no significant

Table 12: type of information the owner is send home with

The owner is send home with…	Respondents (%)	Mean therapy success (%)
an extensive verbal advise	29,2%	30.2% (+/- 19.8)
an extensive written advise	3,1%	38.5% (+/-18.0)
a short verbal advise	10,8%	20.0% (+/-12.3)
a short written advise	4,6%	31.4% (+/-25.3)
verbal as well as a short written advise	43,1%	31.5% (+/-16.3)
verbal as well as extensive written advise	9,2%	43.5% (+/-17.9)

Table 13: information included in written information on overweight and obesity in dogs and cats.

Information included in written advise	Respondents (%)	Mean therapy success (%)
Which type of food is indicated for weight loss and the amount needed	61,5%	31.3% (+/-17.6)
Information concerning overweight and obesity in dogs and cats	9,2%	28.1% (+/-21.9)
Information concerning overweight and obesity in dogs and cats, including the process of weight loss.	24,6%	32.3% (+/-19.3)
N/A	4,6%	

influence on mean therapy success (F=1.14, p=0.35). Providing the client with written information showed higher mean therapy success (33,7% +/-17,11) than providing verbal information alone (27,8% +/-18,7), though not significant (F=1.72, p=0.20). The information

included is shown in table 13, and does not influence mean therapy success significantly (F=0.11, p=0.89). How frequently and how follow up appointments are done, in accordance to mean therapy success, is shown in figure 6 and table 14 respectively and both influence mean therapy success significantly. The frequency of follow-up is a significant influence on mean

Frequency of follow up appointments
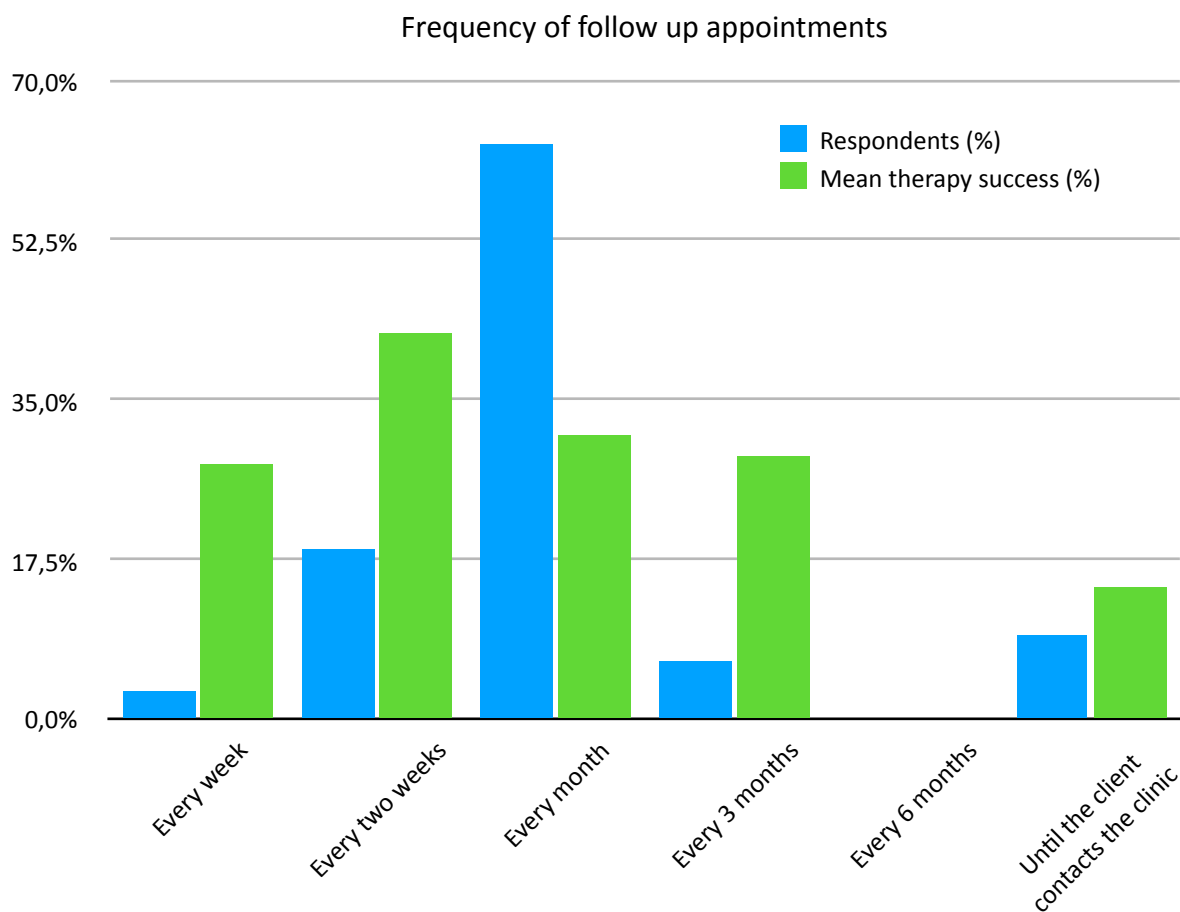
Figure 6: frequency of follow up as reported by respondents. The X-axis shows the frequency of obese patients being followed up by the respondents, in accordance to their mean therapy success. The Y-axis shows the percentage of respondents choosing the specifically follow-up option.

Table 14: method of follow up

Ways to follow up on a patient	Respondents (%)	Mean therapy success (%)
I wait for the client to contact the clinic	47,7%	25.2% (+/-15.5)
I call the owner after one or two weeks to ask how things are going	9,2%	43.5% (+/-16.2)
I call the owner after a month to ask how things are going	6,2%	16.1% (+/-1.1)
I send reminders when it's time to start the next stage of the therapy	9,2%	44.8% (+/-16.2)
I make sure the pet and client are helped by the same vet/assistent with each visit	27,7%	36.9% (+/-18.6)

therapy success (F=2.76 with p=0,04). A post-hoc multiple comparisons showed that biweekly follow up appointments significantly improve mean therapy success compared to respondents waiting for the client to contact the clinic (p=0.02). How follow up is done significantly influences mean therapy success with F=4.41 and p=0.003. The methods used during a follow up appointment, are shown in figure 7 and do not influence mean therapy success significantly (F=0.52, p=0.84).

Methods used for follow up

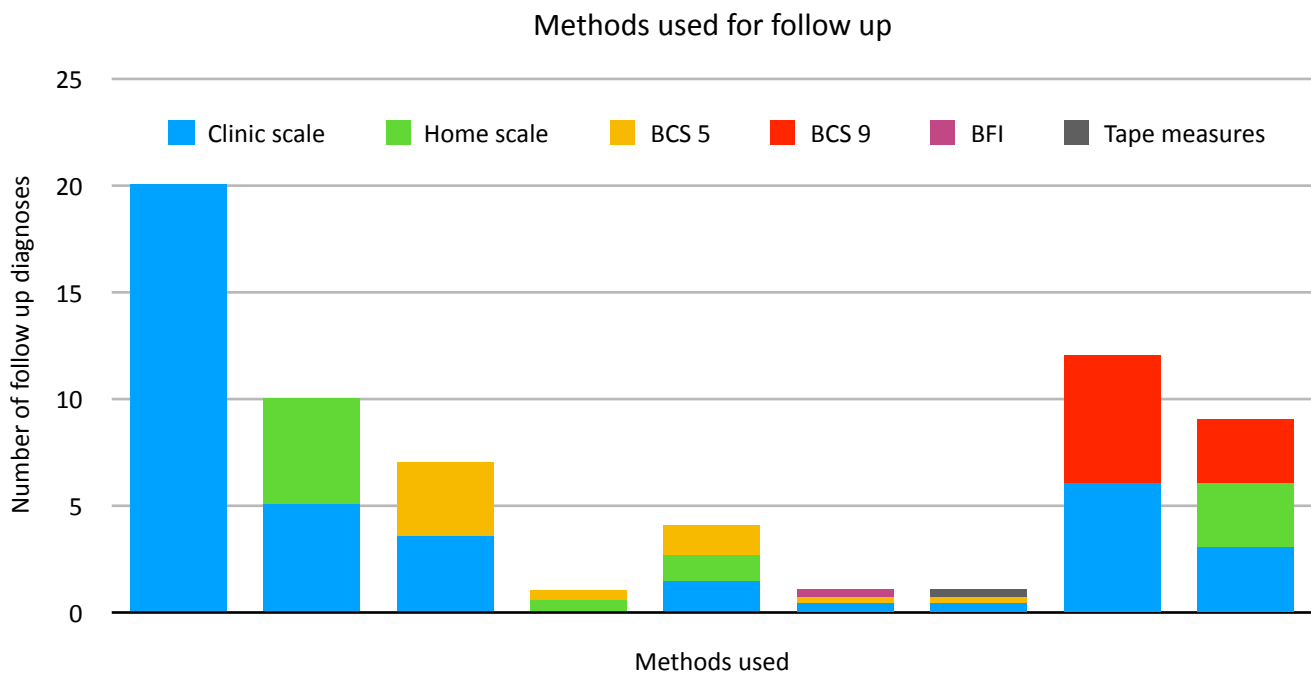Figure 7: the methods used when following up on an obese patient. The X-axis shows the combination of methods used to follow up on an obese patient. The Y-axis shows the portion of respondents choosing this option.

7. Discussion

   7.1. Hypothesis and study expectations
   Expectations about the results of this study were that an active attitude in combatting obesity in companion animals leads to better results in terms of therapy success. An active attitude includes investing time in following continuing education about either communication or nutrition and consultations about obesity, a sensation of responsibility in terms of the causes of obesity, continues addressing of unhealthy pet weight to clients, use of proper diagnostics, therapeutic regimes and communication as described in the above introductory literature study, and consequent follow up on patients.

   Respondent description and assisting staff
   The amount of staff members did not influence mean therapy success. Of all tasks delegated to assisting staff, delegating follow up shows a positive correlation to therapy success (r=0.31) that is significant (p=0.05). Thus letting assisting staff do the follow up of obesity management influences therapy success positively. Neither gender, graduation year or current working position of responding veterinarians influenced therapy success significantly. Unexpectedly, continuing education about communication and nutrition did not influence therapy success significantly, F=0.56, p=0.65 and F=0.27, p= 0.85 respectively.

   Therapy success
   Personal definitions on therapy success do not influence therapy success significantly, but do show a trend: the more demanding the definition of therapy success is, the higher mean therapy success is achieved, which is an unexpected outcome. Veterinarians see owner-related causes as a primary source for overweight and therapy failure. Presumed causes for overweight, obesity or therapy failure showed no significant influence on mean therapy success. However, veterinary action taken after therapy failure influences mean therapy success significantly F(2.709), with p=0.039).

   Addressing Obesity
   The higher de BCS, the more respondents address obesity. However, overweight is discussed in 100% of the patients by 27 respondents and obesity is discussed in 100% of the patients by 40 respondents, which shows partial ignorance of overweight to obese patients, in at least some cases. In patients with obesity, addressing the issue will influence therapy success positively (r=0.27 with p=0.03). As expected, tempting to ignore the overweight of a patient shows negative correlation with therapy success (r=-0.27 with a P=0.03) and should thus be avoided. Surprisingly, how often respondents address overweight had no significant effect on mean therapy success.

   Diagnosis
   The majority of veterinarians use the combination of weight scaling and BCS system of a scale of 9. Although the BCS on a scale of 5 combined with weight scaling provides a better estimated target weight than weight scaling alone, the BCS on a scale of 9 is more accurate than on a scale of 5, and thus should be preferred. Interestingly enough, ultrasound was used by none of the respondents. X-ray and ultrasound are the qualitative methods in this question, which should be accompanied by some form of qualitative method to come to a proper diagnosis and therefor proper target weight. All respondents that use X-ray as a diagnostic method, have it combined with weight scaling as well as the BCS system of 9, which is a good outcome. Which method or methods are used for diagnosing pet weight or overweight did not influence mean therapy success significantly, which is surprising since this dictates the correct target weight, essential to achieve weight loss and was thus expected to influence mean

therapy success at some level. The in-clinic possibilities of weight scaling, including the placement of the scale also showed no significant influence on therapy success.

Treatment

The type of diets prescribed in obesity management all showed weak positive correlation to therapy success, of which none were significant. Prescribing commercial weight loss diet shows stronger correlation (r=0.10 with p=0.46) than prescribing home cooked diets (r=0.07 with p=0.62) or reducing the pet's maintenance food (r=0.04 with p=0.76) did. This was expected, as maintenance food does not serve weight loss as good as commercial weight loss diets do. Using caloric calculations to determine the amount of food indicated for weight loss was positively correlated with mean therapy success (r=0.30), significantly (p=0.02). Surprisingly, using the prescribed amount of food described on the packaging is negatively correlated with mean therapy success (r=-0.17), though without significance (p=0.19). Using caloric calculations to determine the quantity of food needed for weight loss should thus be preferred. Surprisingly, recommendations regarding snacks do not influence mean therapy success significantly (F=1.14, p=0.35).

Recommendations about exercise in general are made in the majority of weight loss programs, while clarifying these recommendations by elaborating on type of exercise, are made only in the minority of weight loss regimes. This is a pity, since elaborating on the type of exercise needed to induce weight loss in cats, helps increase therapy success.

Communication

None of the respondents recognized themselves in the consumerist-style of communication, which is in accordance to findings by Shaw et al., (2006). Most of the respondents described themselves by the paternalist model (n=35) instead of the relationship-centered model (n=30), when the relationship centered model has been proven to be more effective in veterinarian-client communication. Neither the model used by respondents, nor their motive for using this style showed significant influence on their mean therapy success. It was expected that more recently graduated veterinarians would make more use of the relationship-centered model instead of the paternalist model. However, graduation year had no effect on the use of a specific communication pattern. Motives for using the chosen style show that these vary quite severely between respondents. From this data, one could conclude that communication style is not something that is being done consciously, as most respondents either do what they are used to (n=21), or even have no specific reason for communicating the way they do (n=14). Of the respondents motivating their communication style with 'time efficiency' (n=5), the majority have an paternalist communication style (n=4). Research has shown that veterinarians relate the paternalist communication pattern with saving time during consultations, when actual data points out the exact opposite: the relationship-centered communication model is most time efficient (Shaw et al., 2006). Time spent on an initial obesity appointment was expected to be significantly correlated to therapy success. It was positively correlated (r=0.12), though without significance (p=0.36).

Conveying the necessary information to clients showed no significant influence on mean therapy success. Providing the client with written information showed higher mean therapy success than providing verbal information alone, though not significant (F=1.72, p=0.20). The content of the written information had no significant influence of mean therapy success.

Follow up

Most veterinarians follow up on obese patients once a month (n=41). And besides the respondents relying on the client for follow up frequency (n=6), respondents follow up on obese patients at least once every three months. If these follow-up recommendations are correct in clinical cases can be doubted, as respondents primarily place responsibility for the

follow up appointment with the client (n=31), which is surprising. Only 14.92% of respondents (n=10) call the owner within a months time to follow up on the implemented therapy. Predominantly follow up is done by weighing the patient at the clinic. This is a good observation, as weight can best be monitored on the same calibrated scale. However, the method used for follow up showed no significant influence on mean therapy success.

How frequently and how follow up appointments are done, in accordance to mean therapy success, both influence mean therapy success significantly. Biweekly follow up appointments significantly improve mean therapy success compared to waiting for the client to contact the clinic.

7.2. Validity of the research

The internal validity of this research can be considered somewhat questionable. The use of a survey for data collection is sensitive to subjectivity from responders. Answers are not verified and thus the gained data might be an under or over glorified image of the actual situation in practice. As respons decreases as surveys get longer, the survey should be limited in length. This makes is difficult to gain a broad perspective on disease management. Furthermore, distributing the study via social media can make this research less valid, for older generations, that use social media less, might be under represented, while the more recently graduated veterinarians might be over represented. The external validity of this research however can be considered good. Results of this study can be used to create awareness amongst the entire veterinarian population. The external validity would have been greater if the response rate were higher. The author aimed for more than 100 responses, but 65 responses were left after the exclusion criteria were implemented.

7.3. Limitations of this research

This research has several limitations to it. Firstly, the most important questions of the survey were on the last page. Therefore, incomplete questionnaires were often useless (n=23). Secondly, one question was lost in translation between Dutch and French, and could therefor not be used. Thirdly, some questions' formulation left room for interpretation. Also, some questions might have lead to more unambiguous answers when they would have been combined, which would also have shortened the survey.

It is important to realize that the results of the survey only reflect veterinarians' recommendations, and not necessarily what the owner was compliant to in the end. Therefor, some caution must be taken when drawing conclusions as to relating these recommendations to therapy success. Lastly, the research does not answer to veterinary perspective on their contribution to therapy success and failure, which would have been interesting.

7.4. Suggestions for follow up research

Follow up research could be done by doing more detailed studies on each separate aspect of obesity management. This might lead to more detailed information about motives behind veterinary action when managing obesity, which will make improving obesity management easier and more effective.

7.5. The author's interpretation

In general, the results show that obesity management in small animal practice is often not done by the most recent scientific standards. Although no strong correlations were found between veterinary action and therapy success, the veterinarian's responsibility within obesity management can not be denied. Assistants can take over part of this responsibility. However, in the author's perspective creating a treatment plan still belongs to the role of the veterinarian. Surprisingly, veterinarians delegate creating a treatment plan to assistants as well.

Although significance lacked in some data, addressing weight, in both normal weight and abnormal weight patients, is still something that is very important. And although addressing

overweight is not significantly correlated to therapy success, mentioning it to owners is still important. Only 19.6% (+/-25.9) of vets on average stop discussing weight after therapy failure, which, although lower percentages should be aimed for, is positive.

Assistants can take over many parts of obesity management.

7.6. Answer to the hypothesis by other studies

In another study as well, owners are viewed as the primal cause of pet obesity by veterinarians (Cairns-Haylor and Fordyce, 2017). Addressing overweight and obesity was done in 84 percent of the cases. In this study 82,9% (+/-25,4) of the patients with a BCS 6/9 or higher were addressed. Interestingly enough, respondents could also motivate not addressing the issue. Time constraints, presumed lack of owner compliance, concerns of causing offense and owner's obesity were reasons not to address the issue as also found by Churchill and Ward (2016) (Cairns-Haylor and Fordyce, 2017). They found that two-thirds of the responding veterinarians used the BCS to diagnose overweight. This study found that 81,5% of the respondents use the BCS, amongst other methods, to diagnose overweight.

7.7. Conclusion

Veterinarians experience more therapeutic success in canine obesity management, than they do in feline obesity management. Tempting to avoid discussing obesity in patients should be avoided, as this influences therapy success negatively, while addressing obesity influences therapy success positively. In determining the quantity of food needed for weight loss, calculating the individual caloric need should be preferred to using the described amount on the packaging. In cats, veterinarians should elaborate on the type of exercise needed to induce weight loss. Most influence on therapy success is created by correct follow up. Both frequency and how follow up appointments are made, influence mean therapy success significantly. Biweekly follow up appointments are preferred to waiting for the client to contact the clinic. Assisting staff members can influence therapy success positively when handed the responsibility of the follow up. In cases of therapy failure, veterinary action afterwards can still influence mean therapy success positively. In conclusion, it is clear that an active attitude in combatting obesity in companion animals partially does lead to better results in terms of therapy success.

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9. Appendix

9.1. Survey Dutch version

1. Introducerende vragen
   De volgende vragen gaan over de praktijk waar u werkzaam bent als dierenarts en over enkele van uw eigenschappen als dierenarts zijnde
   1. In de praktijk waar ik werkzaam ben, werken … dierenartsen. (vul in)
      1. 1
      2. 2
      3. 3
      4. 4
      5. 5-10
      6. meer dan 10
   2. In de praktijk waar ik werkzaam ben, ben ik
      1. Eigenaar
      2. Geassocieerd
      3. Medewerker
   3. Ik ben een:
      1. Man
      2. Vrouw
   4. Ik ben afgestudeerd in … (Vul in)
   5. Volgt u bijscholing omtrent communicatie met eigenaren?
      1. Nog nooit gedaan en ook niet van plan
      2. Nog nooit gedaan, mogelijk wel in de toekomst
      3. Wel eens gedaan
      4. Met enige regelmaat
   6. Volgt u bijscholing omtrent nutritionele ondersteuning van patiënten?
      1. Nog nooit gedaan en ook niet van plan
      2. Nog nooit gedaan, mogelijk wel in de toekomst
      3. Wel eens gedaan
      4. Met enige regelmaat
   7. In de praktijk waar ik werkzaam ben, werken … assistenten. (vul in)
      1. 1
      2. 2
      3. 3
      4. 4
      5. 5-10
      6. meer dan 10
2. Hoeveel van de obesitas therapie laat u aan de dierenartsassistenten over?
   Beantwoord deze vragen alleen indien u werkzaam bent in een praktijk of kliniek met dierenartsassistenten.
   1. Een gedetailleerde voedingsanamnese (…%)
   2. Het wegen van de patiënt (…%)
   3. Het bepalen van de BCS (…%)
   4. Het opstellen van het behandelplan, inclusief keuze dieet en hoeveelheid ervan (…%)
   5. Uitleggen van het behandelplan (…%)
   6. De opvolging (…%)
3. Oorzaken en diagnostiek
   1. Wat zijn de faciliteiten die uw praktijk biedt, voor de gewichtsinschatting van de <u>hond</u>?
      1. Weegschaal in de wachtruimte

    2. Weegschaal in de consultatieruimte

    3. Weegschaal in zowel wachtruimte als consultatieruimte

    4. Geen weegschaal

2. Wat zijn de faciliteiten die uw praktijk biedt, voor de gewichtsinschatting van de <u>kat</u>?

    1. Weegschaal in de wachtruimte

    2. Weegschaal in de consultatieruimte

    3. Weegschaal in zowel wachtruimte als consultatieruimte

    4. Geen weegschaal

3. Waar ligt volgens u de grootste oorzaak van obesitas bij de <u>hond</u>?

    1. Dier gerelateerde oorzaken (ras, leeftijd, onderliggende aandoening)

    2. Eigenaar gerelateerde oorzaken (te vaak/te veel voederen, te weinig beweging)

    3. Te weinig preventieve maatregelen (vb. te weinig informatieverstrekking, te late diagnose)

4. Waar ligt volgens u de grootste oorzaak van obesitas bij de <u>kat</u>?

    1. Dier gerelateerde oorzaken (ras, leeftijd, onderliggende aandoening)

    2. Eigenaar gerelateerde oorzaken (te vaak/te veel voederen, te weinig beweging)

    3. Te weinig preventieve maatregelen (vb. te weinig informatieverstrekking, te late diagnose)

5. Hoe vaak kaart u het overgewicht van een patiënt aan?

    1. Indien nodig, bij iedere consultatie

    2. Bij enkele opeenvolgende consultaties, maar als de eigenaar er weinig tot niet op in gaat, laat ik de verantwoordelijkheid voor het gewicht vooral bij de eigenaar liggen.

    3. Gedurende één consultatie en niet verder als de eigenaar hier niet goed op reageer/niet in mee gaat.

6. Hoe vaak bent u geneigd het overgewicht van een patiënt te negeren? (…% van de patiënten)

7. In de praktijk waar ik werkzaam ben, schat ik dat …% van mijn patiënten in de gewichtscategorie valt, die hier zichtbaar is: (BCS 6-7/9)

8. In de praktijk waar ik werkzaam ben, schat ik dat …% van mijn patiënten in de gewichtscategorie valt, die hier zichtbaar is: (BCS 8-9/9)

9. Een evaluatie van het gewicht maak ik met: (meerdere antwoorden mogelijk)

    1. Weegschaal

    2. BCS 5

    3. BCS 9

    4. BFI

    5. Metingen van de omtrekken van verschillende lichaamsdelen met een meetlint

10. Overgewicht aantonen doe ik met: (meerdere antwoorden mogelijk)

    1. Weegschaal

    2. BCS 5

    3. BCS 9

    4. BMI

    5. Echografie

    6. Radiografie

4. Bij welk van de onderstaande categorieën kaart u het gewicht van een patiënt aan?

    1. Nooit (0%) tot altijd (100%)

    2. Nooit (0%) tot altijd (100%)

    3. Nooit (0%) tot altijd (100%)

5. Het instellen van een behandeling

    1. In hoeveel % van de gevallen ligt de focus vooral op het verminderen van de hoeveelheid van het huidige voeder, bij het instellen van nutritionele ondersteuning van de obese patiënt (BCS 8/9 of 9/9)

    2. In hoeveel % van de gevallen schrijft u, bij het instellen van nutritionele ondersteuning van de obese patiënt, een commercieel vermageringsdieet voor dat specifiek gericht is op gewichtsreductie?

    3. In hoeveel % van de gevallen schrijft u, bij het instellen van nutritionele ondersteuning van de obese patiënt, een zelf bereid vermageringsdieet voor dat specifiek gericht is op gewichtsreductie?

    4. In hoeveel % van de gevallen doet u het bepalen van de hoeveelheid voeder, die van een vermageringsdieet gegeven dient te worden, op basis van berekeningen van de energie-behoefte van het individuele dier?

    5. In hoeveel % van de gevallen bepaalt u de hoeveelheid voeder, die van een vermageringsdieet gegeven dient te worden, op basis van de aangegeven hoeveelheid

voeder op de verpakking van het vermageringsdieet op basis van het ideaal gewicht van het dier?

6. Bij het instellen van nutritionele ondersteuning van de obese patiënt, bespreek ik ook de manier van voeden, vooral in de vorm van:
   1. Normale eetbak
   2. Eetbak met een timer
   3. Voedingspuzzels
   4. Ik bespreek de manier van voeden niet in detail

7. Snacks
   1. Mogen absoluut niet gegeven worden tijdens de periode van gewichtsverlies. Ik ben hier zeer strikt in.
   2. Worden best niet gegeven tijdens de periode van gewichtsverlies, maar ik besef dat vele eigenaars die toch gaan doen.
   3. Worden best vervangen door een calorie arme snack, zoals sperziebonen.
   4. Mogen gegeven worden, maar slechts een beperkt percentage van de dagelijkse calorische inname.
   5. Mogen gegeven worden, zolang de hoeveelheid calorieën in de snacks afgetrokken wordt van de hoeveelheid onderhoudsvoeding die gegeven mag worden.
   6. Mogen gegeven worden want het is heel moeilijk om dit te verbieden

8. In hoeveel % van de gevallen schrijft u, naast nutritionele ondersteuning, ook beweging voor als onderdeel van uw therapie bij de <u>hond</u>?

9. In hoeveel % van de gevallen gaat de volgende stelling op voor patiënten die u behandeld voor ofwel overgewicht ofwel obesitas?: 'In het voorschrijven van beweging, differentieer ik bij de hond over <u>het type beweging</u> (wandelen, rennen met de bal, fietsen, fysiotherapie).'

10. In hoeveel % van de gevallen gaat de volgende stelling op voor patiënten die u behandeld voor ofwel overgewicht ofwel obesitas?: 'In het voorschrijven van beweging, wordt ook over een bepaalde <u>duur en intensiteit</u> van beweging gesproken.'

11. In hoeveel % van de gevallen schrijft u naast nutritionele ondersteuning ook beweging voor als onderdeel van uw therapie bij de <u>kat</u>?

12. In hoeveel gevallen (...%) gaat de volgende stelling op voor patiënten, die u behandelt voor ofwel overgewicht ofwel obesitas?: 'In het voorschrijven van beweging, differentieer ik bij de kat over het type beweging (spelen met een hengeltje, wandelen aan de lijn, fysiotherapie).'

6. Communicatie met de eigenaar
   1. Tijdens een gesprek met de eigenaar over het gewicht van de patiënt is de volgende optie kenmerkend voor mijn stijl:
      1. Als dierenarts zijnde, zet ik vooral de toon voor het gesprek. Ik haal hierbij zeker de mogelijke risico's van obesitas aan. Hierbij neem ik vooral de rol van beschermheer in voor zowel cliënt als patiënt.
      2. Als dierenarts zijnde laat ik vooral de cliënt zijn of haar verhaal vertellen. Het is vooral de cliënt die bepaalt wat hij of zij wilt bespreken tijdens de consultatie. Mijn mening of kennis omtrent het onderwerp 'obesitas' blijft eerder op de achtergrond.
      3. Als dierenarts zijnde deel ik mijn kennis zeker met de klant, maar in het gesprek zijn de cliënt en ik gelijkaardig in de mate van controle.
   2. Waarom werkt juist deze stijl goed voor u?
      1. Dit kost het minste tijd
      2. Zo bekom ik de meest waardevolle informatie
      3. Daar voel ik me het beste bij/ Dit ben ik gewend
      4. Er is geen specifieke reden

3. Hoeveel tijd neemt u voor een eerste consultatie omtrent het overgewicht/obesitas van een patiënt? (5-90 minuten)
4. Op welke manier informeert u de eigenaar over het voorgeschreven dieet?
    1. de eigenaar wordt vooral voorzien van een bondig mondeling advies
    2. de eigenaar wordt vooral voorzien van een uitgebreid mondeling advies
    3. de eigenaar wordt vooral voorzien van een bondig geschreven advies
    4. de eigenaar wordt vooral voorzien van een uitgebreid geschreven advies
    5. de eigenaar wordt, naast mondeling, ook voorzien van een bondig geschreven advies
    6. de eigenaar wordt, naast mondeling, ook voorzien van een uitgebreid geschreven advies
5. Bij het mee naar huis geven van geschreven adviezen, informeer ik de eigenaar over:
    1. Welk voeder gegeven dient te worden en de hoeveelheden voeder die gegeven moeten worden
    2. Informatie betreffende overgewicht en obesitas bij hond en kat
    3. Informatie betreffende overgewicht en obesitas bij hond en kat, inclusief hoe het corrigeren van het gewicht in zijn werk gaat.
6. Opvolging van het gewicht doe ik met: (meerdere antwoorden mogelijk)
    1. Weegschaal op de praktijk
    2. Weegschaal thuis, de eigenaar houdt het gewicht zelf bij
    3. BCS 5
    4. BCS 9
    5. BFI
    6. Metingen van de omtrekken van verschillende lichaamsdelen met een meetlint
7. Opvolging in de praktijk of kliniek gebeurt
    1. Iedere week
    2. Iedere 2 weken
    3. Iedere maand
    4. Iedere 3 maanden
    5. Iedere 6 maanden
    6. Tot de cliënt hierover contact met ons opneemt
8. Hoe vervolgt u het contact met de eigenaar van een patiënt met overgewicht?
    1. Ik bel de eigenaar na één of twee weken om te vragen hoe het tot nu toe gaat
    2. Ik bel de eigenaar na een maand om te vragen hoe het tot nu toe gaat
    3. Ik stuur reminders als het tijd is de therapie voort te zetten naar een volgend stadium
    4. Bij ieder bezoek zorg ik dat de eigenaar met dezelfde dierenarts/assistent te maken heeft
    5. Ik wacht af tot de cliënt de praktijk contacteert.
7. Therapie succes en therapie falen
    1. Hoeveel procent van de honden met overgewicht behalen uiteindelijk het beoogde resultaat? (Geef een schatting in %)
    2. Hoeveel procent van de honden met obesitas behalen uiteindelijk het beoogde resultaat? (Geef een schatting in %)
    3. Hoeveel procent van de katten met overgewicht behalen uiteindelijk het beoogde resultaat? (Geef een schatting in %)
    4. Hoeveel procent van de katten met obesitas behalen uiteindelijk het beoogde resultaat? (Geef een schatting in %)
    5. Gaat de volgende stelling op voor patiënten die u behandeld voor ofwel overgewicht ofwel obesitas?: "Bij beperkt gewichtsverlies, beschouw ik de therapie nog steeds als een succes"

1. Nee, therapiesucces wordt enkel bereikt indien het ideale gewicht bereikt is.
2. Nee, therapiesucces wordt enkel bereikt indien het streefgewicht bereikt is (indien dit afwijkt van het ideale gewicht).
3. Ja, gewichtsverlies van elke aard kan ik als een succes beschouwen
4. Ja, maar alleen als het gewichtsverlies gepaard gaat met afname van eventueel aanwezige co-morbiditeiten of diens intensiteit.
5. Ja, maar alleen indien het gewichtsverlies gedurende langere tijd aanhoudt (geen rebound).
6. In hoeveel % van de gevallen gaat de volgende stelling op voor patiënten die u behandeld voor ofwel overgewicht ofwel obesitas?: "Hervallen van een patiënt na therapie succes, beschouw ik niet langer als therapie succes"
7. In hoeveel % van de gevallen gaat de volgende stelling op voor patiënten die u behandeld voor ofwel overgewicht ofwel obesitas?: 'Het opnieuw aankomen in gewicht van de patiënt op langere termijn beschouw ik als therapie falen.'
8. Wat beschouwt u als de meest voorkomende oorzaak van therapie falen?
   1. Dier gerelateerde oorzaken (ras, leeftijd, onderliggende aandoening)
   2. Eigenaar gerelateerde oorzaken (te vaak/ te veel voederen, te weinig beweging)
   3. Te weinig preventieve maatregelen
9. In hoeveel % van de gevallen gaat de volgende stelling op voor patiënten die u behandeld voor ofwel overgewicht ofwel obesitas?: 'Therapiefalen is voor mij een reden om in de toekomst niet meer over afvallen te praten.'
10. Wanneer het streven naar ideaal gewicht niet haalbaar blijkt, …:
    1. Kan ik het gewichtsverlies dat wél bereikt kan worden, beschouwen als een succes voor de ingestelde therapie.
    2. Beschouw ik de therapie als niet succesvol en proberen we het later nogmaals.
    3. Beschouw ik de therapie als niet succesvol en zullen we een andere strategie proberen.
    4. Beschouw ik de therapie als niet succesvol en laat ik het gewicht van de patiënt ongemoeid.
    5. Beschouw ik de therapie als niet succesvol en stuur ik de patiënt door, indien de cliënt hier voor open staat.
8. Bedankt voor uw tijd!
   1. Vul hier uw e-mail adres in als u kans wilt maken op een gratis voedingsadvies van het Labo Diervoeding, voeding gezelschapsdieren van de Vakgroep Voeding, Genetica en Ethologie, Universiteit Gent:
   2. Mogen we u opnieuw contacteren om deel te nemen aan onderzoeken rond voeding van gezelschapsdieren van het Labo Diervoeding, voeding gezelschapsdieren van de Vakgroep Voeding, Genetica en Ethologie, Universiteit Gent?
      1. Ja
      2. Nee
   3. Zou u de resultaten van de studie willen ontvangen?
      1. Ja
      2. Nee