

**The Qualities of Successful Online Nutrition Coaches for Weight
Loss Maintenance.**

Ariel Nadas

A dissertation submitted to Auckland University of Technology in partial fulfilment of the
requirements for the degree of Master of Sport, Exercise and Health 2022.

Primary Supervisor: Dr Eric Helms

School of Sport and Recreation

Abstract

The steady increase in obesity rates and obesity-related comorbidities has become a worldwide epidemic. In individuals with obesity and overweight, weight loss of just 5-10% of initial weight can significantly improve health and reduce the risk of other serious health conditions. While self-directed attempts at weight loss are often initially successful, in many cases individuals regain some, if not all, of their weight loss. However, when an individual seeking weight loss engages with a qualified practitioner, they are less likely to regain their weight. Although dietitians are arguably the most suitable practitioner to provide this support, oftentimes they are not the practitioner sought out by those seeking to lose weight. Non-dietitian practitioners such as personal trainers, nutrition coaches, sports coaches, and strength and conditioning coaches are frequently approached for nutrition guidance. Even though weight loss maintenance appears to be a common problem worldwide, there is very little research available regarding non-dietitian practitioners, especially from the perspective of the practitioner, with a focus on weight loss maintenance. Therefore, the aim of this dissertation was to conduct quantitative and qualitative research to explore the beliefs and approaches used by successful online weight loss coaches. Firstly, a literature review was conducted to understand the literature regarding weight loss maintenance, the repercussions of weight regain, and the client-practitioner relationship. A survey and semi-structured interviews were undertaken to explore the associations, traits, and qualities associated with online nutrition coaches' perceived success with their weight loss maintenance clients. The participants in both studies were current or former Diet Doc LLC coaches or National Academy of Metabolic Science (NAMS) graduates. The Diet Doc was specifically chosen because it provides professional support and an evidence-based system for their coaches to operate within,

which is also taught in their NAMS nutrition coaching course, thus providing a unique cohort of online nutrition coaches operating in a supported, evidence-based framework. The quantitative survey, $n = 16$, gathered information on the demographic and professional characteristics of coaches, and the relationships between coaches' levels of qualification, nutrition qualifications, types of qualification, and years of experience and their self-perceived success rates of client weight loss maintenance. Descriptive statistics were analysed, Spearman's correlations and Mann-Whitney U tests used to analyse the data, with significance was set at 0.05. 85.8% of the coaches indicated >50% of their clients maintained their weight loss for over one year, 57.1% always discussed mindfulness with their clients, 50% always discussed psychology and sleep and stress management with clients, and 85.8% performed client check-ins weekly. While the relationships with self-perceived success in the survey were not significant, the direction of the relationships were supported by the literature and the perceived client weight loss maintenance success rates were very high, which should prompt further research. The semi-structured interviews, $n = 4$, provided four key themes strongly supported by the literature: rapport, support methods, a holistic approach, and goal setting. Both the survey and the interviews indicated that this cohort apply evidenced-based practice in their work with weight loss clients. While the statistical analyses were not significant, possibly due to a limited sample size, the demographic information found in the survey was novel and noteworthy. In addition, the findings of both studies are reinforced by the literature. Establishing rapport, frequent interactions with clients, and using holistic and acceptance-based approaches are all recommended practices for coaches seeking to help their clients lose and maintain weight loss. However, further research in this area would be beneficial.

Table of Contents

ABSTRACT	2
ATTESTATION OF AUTHORSHIP.....	7
CO-AUTHORED WORKS.....	8
ACKNOWLEDGEMENTS	9
CHAPTER ONE: INTRODUCTION	11
BACKGROUND	11
PURPOSE STATEMENT AND RATIONALE	14
RESEARCH AIMS	15
STRUCTURE OF THE THESIS.....	16
CHAPTER TWO: LITERATURE REVIEW - WEIGHT LOSS MAINTENANCE AS A CHALLENGE IN THE OBESITY EPIDEMIC	17
INTRODUCTION	17
OBESITY STATISTICS.....	19
SUCCESSFUL WEIGHT LOSS MAINTENANCE.....	21
UNSUCCESSFUL WEIGHT LOSS MAINTENANCE	23
CONTACT WITH PRACTITIONERS	24
WHO NEEDS SUPPORT AND WHO SHOULD PROVIDE IT?.....	29
CONCLUSION	31
CHAPTER THREE: A QUANTITATIVE ANALYSIS OF THE TRAITS AND APPROACHES USED BY ONLINE NUTRITION COACHES IN WEIGHT LOSS MAINTENANCE	33
PREFACE	33
INTRODUCTION	33
METHODS	36
<i>Study Design</i>	36
<i>Participants</i>	36
<i>Data Analysis</i>	37
RESULTS	38
<i>Participants</i>	38
<i>Relationship of education level with coach-perceived successful weight loss maintenance</i> ...	40
<i>Relationship of experience with coach-perceived successful weight loss maintenance</i>	40
<i>Comparison of coach-perceived successful weight loss maintenance by qualification number</i>	40
DISCUSSION	41
<i>Conclusion</i>	46
CHAPTER FOUR: A QUALITATIVE ANALYSIS OF CLIENT-PRACTITIONER RELATIONSHIPS AND PRACTITIONER BELIEFS RELATED TO SUCCESSFUL WEIGHT LOSS MAINTENANCE IN CLIENTS	47
PREFACE	47
INTRODUCTION	47
METHODS	49
<i>Study Design</i>	49
<i>Participants</i>	50
<i>Data Analysis</i>	51
RESULTS	51

<i>Building rapport.....</i>	<i>52</i>
<i>Support methods.....</i>	<i>53</i>
<i>Holistic approach.....</i>	<i>54</i>
<i>Goal setting approach.....</i>	<i>55</i>
DISCUSSION	56
CONCLUSION	60
CHAPTER FIVE: CONCLUSION	62
SUMMARY	62
LIMITATIONS AND FUTURE RESEARCH DIRECTIONS	66
PRACTICAL IMPLICATIONS	67
REFERENCES.....	69
APPENDICES	74
APPENDIX A: ETHICS APPROVAL (CHAPTER 3 AND 4)	74
APPENDIX B: QUESTIONNAIRE	75
APPENDIX C: INTERVIEW GUIDE.....	77

LIST OF TABLES

TABLE 1. COACH-PERCEIVED RATE OF SUCCESSFUL WEIGHT LOSS MAINTENANCE	39
TABLE 2. COUNT N (%) OF LEVEL OF EDUCATION AND NUTRITION EDUCATION.....	39
TABLE 3. COUNT N (%) OF PROFESSIONAL BACKGROUND	39
TABLE 4. FREQUENCY N (%) OF DOMAINS DISCUSSED WITH CLIENTS	39
TABLE 5. FREQUENCY N (%) OF CHECK-INS	40

Attestation of authorship

“I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.”

Ariel Nadas

Co-authored works

In preparation to be submitted to *the International Journal of Sport Nutrition and Exercise Metabolism*:

Chapter 3 Nadas, A., Helms, E. R. A quantitative analysis of the traits and approaches used by online nutrition coaches in weight loss maintenance. <i>International Journal Sport Nutrition and Exercise Metabolism</i> .	Nadas 90%, Helms 10%,
Chapter 4 Nadas, A., Helms, E. R. A qualitative analysis of client-practitioner relationships and practitioner beliefs related to successful weight loss maintenance in clients. <i>International Journal Sport Nutrition and Exercise Metabolism</i> .	Nadas 90%, Helms 10%,

We, the undersigned, hereby agree to the percentages of participation to the chapters identified above.

Ariel Nadas

Dr Eric Helms

Acknowledgements

First of all, I'd like to thank my family, my sister, mum and dad, for always supporting all the crazy things that I decide to do. Without your ongoing support I don't think I would have achieved half the things I have in life. Thank you, Mercedes, for being the older sister that is always there on the other end of the phone when it feels like my life is falling apart. Thank you, mum, for inspiring me to follow in your footsteps and pursue a Masters degree. And thank you, dad, for always making sure I've eaten and forcing me to take a break and come around for dinner.

And of course, thank you to my supervisor, Dr Eric Helms. Everyone has told me that the supervisor-student relationship is totally different to that of a teaching relationship, and now I totally understand why. You have been that solid rock that has kept me sane, seen me cry on a zoom meeting, and put up with several back-and-forth versions of all my writing, all while being so genuinely caring and supportive. Thank you for guiding me and helping me improve my writing and understanding of academia.

Thank you to Dr Matt Cross for helping with the statistics and analyses in my research. I don't think statistical analysis will ever be my forte, but you made the whole process such a breeze and far less stressful than it could have been. Thank you for being so willing to help out and making yourself available for zoom calls. I really appreciate all the work you did to make sense of my data.

Finally, to Dr Joe Klemczewski and the Diet Doc team, thank you for allowing me to do this study and for all your help enlisting as many participants as we could. Without your willingness to help, none of this would have been possible.

Ethics approval

The Auckland University of Technology Ethics Committee (AUTEC) granted ethical approval for this dissertation research on:

- 23 March 2022 AUTEC reference number 22/10 (Chapter 3 and 4)
(Appendix A)

Chapter one: Introduction

1.1 Background

The rates of obesity, obesity-related comorbidities and morbidity have been increasing for decades, nearly tripling since 1975 [1, 2]. Currently, approximately 13% of adults over 18 years old are with obesity globally [2]. This is concerning as obesity is often a precursor for other serious health conditions such as type 2 diabetes, ischaemic heart disease, stroke, several common cancers, and osteoarthritis [2]. In addition, the risk for all-cause mortality is also amplified amongst those with obesity [3]. According to Spieker and Pyzocha [4], more than 20% of US healthcare expenditure is related to medical costs associated with obesity and overweight. Taking this into consideration, it is understandable that individuals with obesity seek to lose weight and often recruit the support of a professional to do so. Self-directed attempts at weight loss can be successful; however, it has been noted that in many cases individuals regain some, if not all, of the weight they lose [5]. This is concerning as even mild rates of weight regain can lead to the regression of health markers to their pre-weight loss baselines [6-8]. Therefore, while the initial weight loss is important, maintaining this weight loss is also crucial to ensure the improvement of health conditions in individuals with obesity or overweight.

It is understood that engaging with a qualified practitioner reduces the likelihood of weight regain [9]. In fact, continued contact with a practitioner after the initial weight loss phase has a direct influence on how much weight an individual regains [10-12]. The modality of contact has also been briefly noted in the literature, with individuals receiving personalised counselling experiencing less weight regain than those receiving minimal support or technology-based interventions [13]. The frequency of interactions with a practitioner also has a significant effect on the

likelihood of successful weight loss maintenance, with more interactions leading to better weight management [14-16]. Not only is frequent practitioner-client interaction important for weight loss maintenance, but the type of support and approaches that the practitioner takes with each client are also crucial to the client's success. The 'small changes' approach has been noted to be popular amongst dietitians [17]. In addition, Kleine and colleagues [18] note that coaching style, such as the degree of support and the format of health coaching, should be individualised to each client. Furthermore, specific techniques used by practitioners with their clients have an ongoing effect on the likelihood of successful weight loss maintenance irrespective of continued support. Participants in the Mind Your Health project that were provided with acceptance-based behavioural therapy attained greater weight loss and were more likely to maintain this weight loss than those receiving cognitive behavioural therapy [19]. While there appears to be ample research assessing the presence, frequency, and length of support for weight loss maintenance, there is less on the specific type of support, and even less on practitioner traits that might be associated with successful weight loss maintenance, or the impact of the coaching relationship quality between practitioners and clients.

There are a variety of practitioners that are in a position to help clients or patients lose weight and maintain their weight loss. According to Williams et al. [20], "dietitians are health professionals with specialised training in weight management". While in most cases a dietitian would arguably be the most appropriate practitioner to engage with, only 10% of individuals told to lose weight engage with a health professional (including dietitians) [21]. Other practitioners such as personal trainers, strength and conditioning coaches, and health coaches, are often sought out by individuals looking for nutrition guidance. Personal trainers are oftentimes expected

by their clients to provide individualised, specific nutrition care but this can be beyond their scope of practice depending on the situation, client, and region [22]. Some research indicates that personal trainers have limited knowledge regarding diet-disease relationships and should therefore avoid providing specific diet-disease advice [23]. Regardless, depending on their training and region, personal trainers may be able to provide competent nutrition education and behavioural advice to help their clients improve body composition and general health [24]. Considering that dietitians may not always be the most commonly accessed practitioner for weight loss, further research is needed on practitioners acting as “nutrition coaches” such as personal trainers, unregistered nutritionists, and health coaches who may be providing nutrition guidance. Such practitioners often seek to further their knowledge through additional qualifications such as NAMS or training such as Diet Doc. The NAMS qualification is a one-off nutrition qualification practitioners can complete to enhance their nutrition knowledge. The Diet Doc is a franchise programme involving upskilling, and ongoing education and mentoring.

Thus, for all the aforementioned reasons, there is a clear need for further study into less researched practitioners, such as nutrition coaches. Specifically, such research should investigate the traits and practices specifically of the successful nutrition coaches. Not only is research into the traits and practices of practitioners lacking, but specifically assessing successful coaches may be critical given, unlike dietitians, “nutrition coaching” is a largely unregulated profession which can lead to varied levels quality of care in clients.

1.2 Purpose statement and rationale

The primary purpose of this dissertation was to understand the characteristics, practices, and qualities of nutrition coaches who perceive that they have high rates of client weight loss maintenance success, as well as the associations between their characteristics, such as qualifications, experience, and training background, and practices with these rates. To fulfil this purpose, a quantitative survey of nutrition coaches was conducted, along with follow up qualitative interviews with a sub-sample of these coaches.

This dissertation specifically focused on participants who are current or former coaches with the US-based coaching company, the Diet Doc LLC, or graduates of its associated nutrition coaching certification program, the National Academy of Metabolic Science (NAMS). Diet Doc LLC coaches and NAMS graduates were specifically targeted as Diet Doc LLC coaches receive coaching guidance from, and continued access to a multi-disciplinary team of allied health professionals which includes medical doctors, physical therapists, psychologists, dietitians, and strength and conditioning specialists. Likewise, the NAMS certification was designed and reviewed by the same multi-disciplinary team, and thus, this population was thought to have a higher probability of taking an evidence-based, individualised, best-practice approach to nutrition coaching, which allows this dissertation to investigate the practices of coaches that are more likely among non-dietitian practitioners to have successful weight maintenance clients.

Finally, this dissertation was methodologically designed to address the gaps in existing research, which is lacking in the following key areas which this dissertation intends to bridge:

- Many studies address weight loss maintenance from the client's perspective but there are very few that look at the perspective of the practitioner.
- Previous research that looks at the practitioner is generally limited to registered dietitians and does not provide insight into other practitioners who frequently engage with the public, such as nutrition coaches and personal trainers.

1.3 Research aims

The main objectives of this dissertation were to determine:

1. To determine whether coaching qualification level is associated with the perceived rate of clients successfully maintaining weight loss.
2. To determine whether perceived successful client weight loss maintenance differed between those within/without the Diet Doc LLC (i.e., just a NAMS graduate, not within the Diet Doc).
3. To determine whether those with more nutrition qualifications have different rates of self-perceived successful client weight loss maintenance.
4. To determine whether years of coaching experience are related to the rates of self-perceived successful client weight loss maintenance.
5. To qualitatively assess and describe the key themes common amongst 3 successful weight loss maintenance coaches within the Diet Doc franchise or who were NAMS qualified, through semi-structured interviews.
6. To make recommendations to practitioners based on the findings.

It was hypothesized that coaches with a higher level of nutrition qualification and more experience would have higher self-perceived client success rates for weight loss maintenance. It was also hypothesized that frequent interaction with clients and the

discussion of several domains including nutrition, physical activity, and mindfulness would be related to higher self-perceived client success rates weight loss maintenance.

1.4 Structure of the dissertation

This dissertation was conducted using quantitative and qualitative research methodologies to answer the overarching question, “what qualities make a successful online nutrition coach?”. As a pathway two dissertation at AUT, Chapters 3 and 4 are written in the format of published journal articles. Chapters 3 and 4 include a preface to connect each chapter and ensure that the dissertation is cohesive.

The present chapter serves to outline the structure of this dissertation and to introduce the basic concepts and frameworks involved throughout this dissertation (e.g., the obesity epidemic, weight loss maintenance, online coaching) to answer the overarching question. The second chapter is a broad review of the current literature on current practices in online nutrition coaching. It concludes by highlighting the need for further research into this area, particularly focusing on the practitioner’s role.

Chapter three is centred around the quantitative survey data collection and results. In this chapter the results of the survey are analysed, and the interpretation of the relationships are discussed. Chapter four includes a detailed thematic analysis of the qualitative data that was collected through semi-structured interviews. The final chapter summarizes the findings of this research and provides context as to how it relates to the larger body of research, finishing with conclusions, practical applications, and further research recommendations for this field.

Chapter two: Literature Review – Weight loss maintenance as a challenge in the obesity epidemic

2.1 Introduction

The rates of obesity and obesity-related illness and morbidity have been on an upward trend for decades [1]. Obesity is associated with a myriad of other health conditions such as Type 2 diabetes, ischaemic heart disease, stroke, several common cancers, osteoarthritis, and sleep apnoea [25]. In New Zealand, 34.3% of adults are categorised with obesity, a 3.1% increase since 2020 [25]. With these rising rates of obesity comes the challenge of losing weight and more importantly, maintaining weight loss. According to Claessens et al. [26], systolic and diastolic blood pressure can further decrease by 3% and 4%, respectively, when weight loss is maintained. While the majority of change to blood lipids, blood pressure, glucose, and insulin concentration happens during the weight loss phase, weight loss maintenance maintains these new levels [6]. The importance of weight loss maintenance is not just limited to those with obesity or overweight. Weight-class based athletes and athletes in sports which require a high power-to-weight ratio also may seek successful weight loss maintenance during their sporting career [27]. Weight loss maintenance is challenging as the average individual regains nearly half of their initial weight loss in the first year following the initial loss [5].

While many people have initial success with weight loss when they take an autonomous approach, maintaining this weight loss proves to be an area where many struggle as many individuals regain some, if not all, of their weight loss [5]. While self-directed attempts at weight loss are often initially successful, supported,

supervised weight loss programmes are more likely to have successful weight loss outcomes and less likely to have negative potential health effects seen in unsupervised dieting [28, 29]. This is further evident in the findings of Green et al. [30] who noted that supported dieters lost more body weight, and had a greater decrease in body mass index and body fat percentage than non-supported dieters. However, as discussed, more important than the active weight loss phase is weight loss maintenance, which is also enhanced by long-term dietitian support which increases the likelihood of avoiding weight regain [9].

As previously mentioned, engaging with a qualified practitioner reduces the likelihood of negative potential health effects. However, there are a large range of practitioners who are in a position to help clients or patients lose weight and maintain their weight loss. In most countries the most appropriate clinical practitioner fulfilling this role is a dietitian; however, only 10% of patients engage with a health professional (including dietitians) when told they need to lose weight [21]. This is important to note especially, as according to a meta-analysis by Williams et al. [20], individuals consulting with a dietitian lose 1.03kg more weight than those who engage with usual care. As individuals looking to lose weight often recruit personal trainers, personal trainers are often expected by their clients to provide nutrition care reaching beyond their scope of practice [22]. Sports coaches are also often sought out by athletes as a source of nutrition information; however, nutrition advice is beyond the scope of a sports coach's practice and not typically part of their training. For example, Zinn et al. [31] found that New Zealand premier club rugby coaches were inadequately prepared to provide nutrition advice and could benefit from further nutrition education. Indeed, more research is needed to determine the effectiveness of other non-dietitians who

may be in a position to provide nutrition guidance in a sport or health context such as personal trainers, strength and conditioning coaches, and health coaches.

Therefore, the aim of this narrative review is to address the current body of knowledge on the role of the practitioner in weight loss maintenance. To address this aim, a literature search was conducted for peer reviewed studies from several databases: PubMed Central, Scopus, EBSCO, Ovid, and Google Scholar. Multiple search strings were used with Boolean operators to combine keywords. Example search strings were: “weight loss maintenance OR weight management AND obes* OR overweight AND success*” and “weight loss OR weight management AND practitioner OR dietitian OR nutritionist OR personal trainer AND interaction OR communication OR contact”. Peer reviewed English-language papers were selected by initially screening titles and abstracts to assess their relevance to the aim, then the relevant papers were read in full to inform a qualitative, narrative review of the topic.

In particular, this review addresses the scope of the current obesity epidemic, what defines successful weight loss maintenance, and the rates at which it is achieved. In addition, the current literature on supervised and non-supervised weight loss, and the physical and psychological effects of weight regain are assessed. Further, client-practitioner interactions and practitioner traits most commonly associated with successful weight loss and weight loss maintenance are discussed. Finally, research on what populations seek nutrition advice is evaluated to further develop an understanding of why different practitioners are commonly sought out.

2.2 Obesity statistics

According to the World Health Organisation [2], obesity has nearly tripled since 1975 and is showing no signs of slowing down. In 2016, more than 1.9 billion

adults were classed as overweight, of which more than 650 million were classed as with obesity [2]. That equates to 13% of adults over 18 years being with obesity globally. Obesity is often a precursor for other serious health conditions, including type 2 diabetes, ischaemic heart disease, stroke, several common cancers, and osteoarthritis [2]. Individuals with obesity are five times as likely, or greater, to develop Type 2 diabetes, dyslipidaemia, and sleep apnoea in terms of relative risk compared to individuals without obesity [32]. Decreased gait speed has been associated with an increased risk for mortality [33], which is cause for concern as Park and Kim [34] note that adult women with obesity have significantly slower gait speeds than women of a normal weight ($p = 0.011$) and report lower poorer quality of life and reduced mobility.

Not only do these conditions have negative effects on quality of life for individuals suffering from obesity, but without intervention they can be fatal. According to Borrell and Samuel [3], individuals with obesity have higher all-cause mortality death rates compared to those without obesity, with hazard ratios of 1.31-1.4 depending on the grade of obesity. Women with any grade of obesity are likely to die between 1.6-5.2 years earlier than women without obesity [3].

In addition, the economic costs to society of the obesity epidemic cannot be ignored. Worldwide, obesity is estimated to account for 0.7-2.8% of a country's healthcare expenses, and the upper range of this further increases to 9.1% when healthcare expenses related to individuals in the overweight classification are included [35]. In 2016 the direct and indirect medical costs associated with obesity in the USA were as high as \$209 billion USD and accounted for more than 20% of annual health care expenditure [4]. On an individual level, individuals with obesity have 42% higher

healthcare expenses than their counterparts without obesity [35]. Therefore, it is apparent that the global obesity epidemic is cause for concern and should be addressed.

2.3 Successful weight loss maintenance

There are several definitions of what qualifies an individual's weight loss maintenance as successful. Weight loss maintenance has been defined as the process of sustaining significant intentional weight loss through one's own efforts or as a result of treatment [36]. According to Wing and Phelan [37], maintaining a weight loss over 10% of the initial body weight for longer than one year is deemed successful because significant improvements in risk factors for diabetes and heart disease can be noticed with weight losses of this degree. However, it has also been suggested that maintaining just a 5% weight loss for over one year should be sufficient to be classed as successful weight loss maintenance [38]. Marchesini et al. [38] agree that a modest weight loss of 5-10% should be regarded as successful because this amount of weight loss is enough to improve health conditions and reduce risk of other related illness in individuals with obesity. Specifically, Marchesini and colleagues argue for a 5% value because it is sufficient in reducing the risk of developing type 2 diabetes and the development of other comorbidities related to obesity. Indeed, the Diabetes Prevention Program Research Group [39] note that the risk of developing type 2 diabetes is significantly reduced with a 5-10% weight loss.

This threshold is further supported by the joint recommendations of the American College of Cardiology and the American Heart Association [40], who note that just a 5% weight loss leads to lower systolic and diastolic blood pressure by approximately 3 and 2 mmHg, respectively. Further, individuals with diabetes in the overweight or obese classification categories who lose 5-10% of their bodyweight

decrease HbA1c concentrations by 0.6-1.0% and decrease their need for diabetic medications [40]. Therefore, based on the scientific consensus in the literature, it is reasonable for practitioners and researchers to use 5% weight loss maintained over one year as a suitable threshold for successful weight loss maintenance.

Bearing in mind this threshold for successful weight loss maintenance, the success rates of individuals maintaining a 5% weight loss should also be noted. According to Kärkkäinen et al. [41], only 28.6% of women and 23% of men maintained their weight over ten years. These rates of successful weight management appear to further decrease when a greater initial weight loss is involved. When an initial weight loss is greater than 10%, only 19.3% of women and 18.8% of men maintained their weight loss [42]. Moreover, individuals with support during the weight loss maintenance phase show higher success rates of maintaining their weight loss. For example, in the Look AHEAD study, 50.3% of participants who received continuous support (one in-person and one email or telephone counselling session per month, each, with optional monthly group meetings) maintained a weight loss greater than 5% over 8 years, whereas only 35.7% of participants who did not receive continuous support (just one group meeting per quarter) were successful at maintaining a weight loss greater than 5% [43]. Further, the type of care during the active weight loss phase may prospectively impact subsequent weight loss maintenance. Specifically, Forman and colleagues [44] note that participants who received acceptance based therapy in the Mind Your Health project were more likely to maintain a $\geq 10\%$ of body weight loss after 36 months than those who received standard behavioural therapy (31.6% versus 17.1%, respectively, $p = 0.04$). Therefore, it is apparent that the type of care during the weight loss phase, as well as the presence of continuous support that extends beyond the initial weight loss phase and into the

maintenance phase, are likely to improve the likelihood of successful weight loss maintenance.

2.4 Consequences of weight regain

Unfortunately, even mild degrees of weight regain result in blood pressure, blood glucose, and insulin concentrations returning toward their baseline measurements [6]. Specifically, while initial weight loss produced a significant decrease in oxidised low density lipoprotein (LDL) concentrations of 22%, participants who experienced substantial weight regain (14% weight regained) had a greater rebound of LDL concentrations with increases of 39% ($11.2 \pm 17.2 \mu\text{mol/l}$, $p \leq 0.001$), whereas those who experienced minimal regain (3% weight regained) only had a 9% ($2.0 \pm 6.9 \mu\text{mol/l}$) increase in LDL [7]. Similarly, these patterns are also seen in blood pressure measurements. In a study by Márquez-Quñones et al. [8], participants who regained their weight increased systolic and diastolic blood pressure by 7 ± 0.1 and 2.1 ± 0.0 mmHg, respectively ($p < 0.05$), whereas those who maintained their weight loss experienced marginal changes to systolic blood pressure (increasing by 1.8 ± 0.1 mmHg) while diastolic blood pressure further decreased by 0.4 ± 0.1 mmHg [8].

In addition, weight regain often leads to weight cycling, a repeated cycle of weight loss and regain [45]. This is further cause for concern as the greater the number of attempts at weight loss, the lower the success rate is among individuals with obesity [46]. Individuals least successful with weight loss had almost twice as many attempts at losing weight than their successful counterparts (3.3 ± 2.9 versus 1.49 ± 2.3 , $p = 0.001$) [47]. Weight cycling is also strongly associated with binge eating disorders [45]. According to Foster et al. [48], weight regain is also associated with a significant

worsening in body image. Appearance evaluation scores decreased the most (showing greater dissatisfaction) in participants who regained more than 5kg, with scores dropping from 3.4 ± 0.7 to 3.1 ± 0.7 ($p = 0.002$) [48]. Individuals who can maintain their weight report significantly better general wellbeing, less stress, and have better eating self-efficacy than their weight fluctuating counterparts [49]. Further, 53.2% of participants who had weight fluctuations assessed themselves as having excellent mental health, compared to 65.9% of their nonfluctuating counterparts [49].

Repeated weight cycling is also common in many high-level sports where making a weight class is necessary or in sports where a high power-to-weight ratio is advantageous. Weight cycling has a negative effect on these athletes as they tend to have greater weight gain and are three times more likely to develop obesity than their non-weight cycling counterparts [27]. In an effort to control weight, many athletes restrict their dietary intake which can result in low energy availability (LEA). Viner et al. [50] noted that 70% of cyclists in their study restricted their energy intake year-round to control weight, and 70% had LEA throughout all seasons of cycling. This can cause a myriad of other problems for athletes as LEA is associated with low bone mineral density and an increased likelihood of stress fractures, especially in female athletes [50, 51]. Nose-Ogura and colleagues [51] found that female athletes with secondary amenorrhea were 12.9 times more at risk of a stress fracture. Weight cycling and weight regain have several negative effects physically and psychologically, thus there should be greater emphasis on weight management following weight loss.

2.5 Contact with practitioners

Based on the aforementioned weight loss maintenance failure rates and the negative impacts that unsuccessful weight loss maintenance has both physically and

psychologically, the importance of successful long-term weight management is clear. Importantly, practitioner contact during the weight maintenance phase may be a critical factor for long-term maintenance. Several studies have investigated the effect of frequency and duration of contact with practitioners on the likelihood of success [11, 13, 52].

Indeed, the observations of Voils et al. [11] support this notion, as those who continued contact with the practitioner regained a mean of 1.6kg less than those who were self-directed ($p = 0.04$). Further, as reported by Svetky et al. [13], participants in their personal-contact group, who received personalised monthly counselling, regained 1.5kg less weight over 30 months than their self-directed counterparts who received minimal support ($p = 0.001$), and 1.2kg less than a technology-based intervention where participants could engage with an interactive website ($p = 0.008$). Similarly, Bachar et al. [10] found that participants who attended follow-up sessions with a dietitian were 13.4% more likely to succeed in their weight loss management, and weight loss participants in a study by Perri et al. [53], who continued patient-therapist contact beyond their initial weight loss phase, maintained a 10.7kg mean weight loss more than those who did not at a 17 month follow up. This pattern has been observed for decades, as it is supported by Perri et al. [12] in 1989, who noted that participants who received extended care lost 3.6kg on average at a 40 week follow-up, while those who did not receive extended care had regained 2.5kg.

It is unknown whether the key factor is the continuance of care per se, or simply the presence of support. Elfhag and Rossner [36] note that a factor associated with weight regain is a lack of social support. Moreover, extended care, regardless of whether it was via telephone or face-to-face contact improved the maintenance of weight lost among obese women with those receiving extended care regaining a mean

of 1.2kg and those not receiving extended care regaining a mean of 3.7kg after 18 months [54]. Similarly, greater weight loss, as much as 10kg, was recorded for individuals that continued to attend more group sessions with a nutrition counsellor throughout a 20 week study [55]. Finally, Kim et al. [14] reported the frequency of medical visits was significantly higher in their successful weight loss group than in their unsuccessful group (8.6 ± 4.4 sessions and 5.7 ± 2.5 sessions, respectively, $p < 0.001$) and the time spent receiving continued follow-ups was also greater in the successful weight loss group as they had significantly more total follow up days than the unsuccessful group (165 ± 99.7 and 104 ± 81.1 , respectively, $p < 0.001$). There is even a positive relationship between the amount of supportive text message contact and weight lost, with those receiving the most texts losing 1.9kg ($p = 0.02$) more than those receiving fewer texts [56]. Fjeldsoe et al. [56] also found that more text messages had a positive influence on physical activity levels with individuals receiving more texts having larger increases in moderate to vigorous physical activity time by 20 to 30 minutes per week.

The frequency of support and contact appear to be important variables impacting weight loss maintenance. Significant weight loss and the maintenance of this weight loss was found in a study by Coates et al. [16], who noted that the only group that showed a significant decrease and maintenance of their weight loss after 6 months was the group that received daily contact rather than weekly, as the percentage of overweight participants in this group dropped from 37.3% to 29.3% ($p < 0.04$). Furthermore, a meta-analysis by Schippers et al. [15] found that more frequent interactions had a positive relationship with greater weight loss. The effect size for studies with higher frequencies of interactions (between 1 – 4.03 interactions per day) was Cohen's $d = -0.36$ ($p < 0.01$), while for studies with less than 0.6 interactions per

day the effect size was $d = -0.07$ ($p = 0.514$). In the Look AHEAD project, the participant group that had higher rates of successful weight loss maintenance met with their practitioner one-on-one once a month with a follow-up phone call or email two weeks later, compared to the less successful group who only had access to quarterly group meetings [43]. While there appears to be ample literature regarding the positive relationship between ongoing contact and successful weight management, the ideal duration of continued contact is yet to be investigated thoroughly. The frequency of practitioner contact is noted as important in the literature, but the majority of the research hasn't differentiated the quality of this contact, and much of it focuses on text message contact rather than one-on-one, personalised nutrition coaching interactions which could plausibly have superior impact.

Related to the type of support, the specific techniques used by practitioners that are associated with successful weight loss and weight loss maintenance have received some, but not thorough research. Techniques such as a “small changes” approach to diet improvement, combining diet, exercise, and behaviour modification are popular among dietitians seeking to help clients maintain weight loss [17]. Further, Karmali and colleagues [57] noted that active listening, encouraging daily self-reflection, and open-ended questions are common tools utilised by dietitians seeking to improve weight loss success rates. While these are methods commonly applied by dietitians, they are infrequently studied and compared. Further, it is important to note that barriers and facilitators may vary between clients and therefore, the personalised application of these weight management techniques is encouraged. According to Kleine et al. [18], the coaching style should be individualised to each client, such as the degree of supportiveness, and format of health coaching. While most research on successful weight loss maintenance highlights the importance of continued support

and practitioner contact, there is data to suggest that the specific techniques employed, even in the absence of continued contact in the maintenance phase, can have a significant impact on future weight loss maintenance. For example, in the Mind Your Health project, some participants seeking weight loss were provided with acceptance-based behavioural treatments that included the encouragement of self-regulation skills and controlling the aspects of life that the participants could [19]. Other participants were provided with the more commonly utilised, cognitive behavioural treatments, which emphasised self-efficacy, self-esteem, and distraction-based coping strategies [19]. Not only did the acceptance-based group attain greater weight loss initially in the first 12 months compared to the standard behavioural treatment group ($13.3\% \pm 0.83$ versus $9.8\% \pm 0.87$, $p = 0.005$), but the acceptance-based group was also more likely to maintain a $\geq 10\%$ of body weight loss 12 months later than those who received standard behavioural treatment (64.0% versus 48.9%, respectively, $p = 0.04$) [19]. These findings highlight that different practitioner approaches have a significant influence on successful weight loss maintenance and should be further researched.

To conclude, it appears that the frequency, length, and mode of support following weight loss are critical factors for weight loss maintenance, as are the specific techniques practitioners use to facilitate weight loss and long-term maintenance. However, there appears to be little research on practitioner traits that are associated with successful weight loss maintenance in clients, or research on the nature of the coaching relationship between practitioners and clients (e.g., autonomy support, for example). Therefore, these aspects of practitioner-client interactions and practitioner traits should be investigated in future research.

2.6 Who needs support and who should provide it?

Given the rise in obesity and related comorbidities, and the literature indicating that weight loss improves health markers relevant to such diseases, it is logical that individuals with obesity are likely to seek weight loss. Research by Ko et al. [58] found that those with extreme obesity (BMI 40+) and those diagnosed with class II obesity (BMI 35-39.9) are, respectively, 2.8 (95% CI 1.9-4.2) and 2.1 (95% CI 1.6-2.7) times more likely than those diagnosed with class I obesity (BMI 30-34.9) to be advised to lose weight by their physician. In addition, those with chronic disease were 2.1 (95% CI 1.6-2.7) times more likely to be told to lose weight [58]. According to Jackson et al. [59], when advised to lose weight by a healthcare professional, the likelihood of an individual wanting to weigh less (OR = 3.71) and attempt weight loss (OR = 3.53) more than triple. However, De Heer et al. [21] notes that only 10.9% of patients told to lose weight actually recruit the help of a health professional. De Heer and colleagues [21] also note that those with health insurance were 2.74 ($p = 0.002$) times and females were 1.53 ($p = 0.01$) times more likely to seek help from a professional. Thus, it seems that the severity of obesity and disease, whether medical advice to lose weight is given, the financial means to afford treatment, and sex may all influence whether someone attempts weight loss, but regardless, most attempts occur without guidance from a healthcare professional.

While many who seek nutrition guidance or support are individuals with obesity from the general public, weight loss coaching is not limited to this demographic and many athletes seek nutrition or supplementation guidance from sports coaches. According to Slater and colleagues [60], approximately 19% of Singaporean athletes received supplementation advice from their coach, whereas only 5% received advice from dietitians or nutritionists. Similarly, family and friends

(52.7%), and coaches (40.7%) were some of the most often used sources for supplementation advice amongst Canadian athletes [61]. Competitive level, region, and funding may influence who athletes seek out. For example, in a study of US university athletes, only 58.2% reported having access to a dietitian [62]. Thus, it is unsurprising that these athletes were most likely to seek nutrition guidance from a strength and conditioning specialist.

Rather than seeking help in the healthcare sector, many may engage with the fitness industry. Often patients are told to lose weight through diet and exercise and as a result of this personal trainers have been identified as being in the ideal position to provide this guidance [63]. With that said, personal training clients often expect personal trainers to provide nutrition care beyond their scope of practice [22]. Further, McKean and colleagues [23] note that exercise professionals are limited in their knowledge of diet-disease relationships, and in a test of their general nutrition and diet-disease knowledge, registered exercise professionals scored significantly lower than dietitians ($65.4\% \pm 18$ versus $91.4\% \pm 10.7$, $p < 0.001$). However, personal trainers are not homogeneously educated or trained. In one study of well-educated personal trainers (96.2% holding a university degree), those with a nutrition certification scored significantly higher on a nutrition knowledge test than those without (18.2 ± 2.0 versus 17.1 ± 1.9 correct questions out of 21, $p = 0.04$) [24]. Therefore, although exercise professionals should avoid providing specific diet-disease advice, they are typically within their scope of practice (depending on region) and (depending on their training) when providing nutrition education and general guidance in line with national guidelines, and therefore, may be able to provide competent nutrition education and behavioural advice to help their clients improve body composition and general health [24].

Overall, across many populations, it is apparent that dietitians and primary care providers are not the only practitioners that individuals seek out for nutrition guidance and support. It is evident that personal trainers, sports coaches, strength and conditioning specialists, and non-dietitian nutrition coaches, depending on the population, are likely to deal with weight loss and weight loss maintenance. Few studies have assessed successful weight loss maintenance from the perspective of these practitioners, therefore further research is required regarding the efficacy of non-dietitian nutrition coaches and other related practitioners.

2.7 Conclusion

Weight loss maintenance is a challenge for many and affects millions of lives worldwide. Obesity can negatively affect health and increases one's likelihood of developing chronic disease. Therefore, it is understandable that many seek weight loss; however, weight loss maintenance is difficult, and efforts often result in full or partial regain of lost weight. This is cause for concern as weight regain can lead to the regression of health markers to pre-weight loss baselines. Furthermore, weight regain can lead to weight cycling, which has negative effects on both mental and physical health.

The current literature indicates there are positive relationships between more frequent interaction with practitioners and successful weight loss maintenance. One-on-one in person sessions, group sessions, and even text-based support can all improve the likelihood of weight loss maintenance. However, as witnessed in the Mind Your Health project, different approaches such as acceptance-based behavioural treatment and a focus on improving an individual's self-regulation skills can impact long-term weight loss management differentially from typical care. Therefore, while

practitioners should continue engaging with clients after the initial weight loss phase to further support weight management, the methods used by practitioners are also important. Researchers note that dietitians with successful weight loss clients commonly employ a method that involves making small adjustments and tailor their approach to each client's needs according to their barriers and facilitators. Further, the literature indicates that common tools utilised by practitioners include lifestyle and behavioural counselling, addressing factors such as an individual's self-regulation skills, self-efficacy, and self-esteem.

However, dietitians are not the only practitioners approached for nutrition guidance. Personal trainers, strength and conditioning specialists, and non-dietitian nutrition coaches may be frequently sought out, depending on the population. Considering there are only a limited number of nutritional healthcare providers available at any time and, depending on the specific needs of the population seeking guidance, different practitioners may be more or less appropriate choices depending on context. This highlights the need for further research into less researched, but commonplace practitioners such as personal trainers and health coaches who may be providing nutrition guidance. Investigating their success rates, and then specifically evaluating the traits and practices of the successful nutrition coaches (i.e., those that achieve successful weight loss maintenance with their clients) may be an important step in ensuring better access to quality care for a larger proportion of the populace.

Chapter three: A quantitative analysis of the traits and approaches used by online nutrition coaches in weight loss maintenance

Preface

The review of the literature (Chapter 2) revealed that further research is required on non-dietitian weight loss practitioners to improve the global obesity epidemic. Therefore, the purpose of the current chapter is to investigate the demographic characteristics, experience, qualifications, details of client interactions, domains of focus, and self-perceived client weight loss maintenance success rates through quantitative research on online nutrition coaches. This was conducted through a survey of Diet Doc LLC and NAMS graduate nutrition coaches, as follows, which is planned for submission to *the International Journal of Sport Nutrition and Exercise Metabolism*.

3.1 Introduction

Individuals with obesity often seek to lose weight. While self-directed weight loss attempts may be successful, individuals will often regain some, if not all, of their weight loss [5]. However, greater weight loss success occurs and the rate of weight loss maintenance success increases when professional support is sought out [9, 30]. Specifically, Green et al. [30] noted that supported dieters lost more body weight, and had a greater decrease in body mass index and body fat percentage than non-supported dieters. Furthermore, not only do supervised weight loss programmes have a greater chance of producing successful weight loss outcomes, they are also less likely to result in the negative health effects sometimes seen in unsupervised dieting [28, 29]. A meta-

analysis by de Heer and colleagues reported that individuals who enlist the help of a dietitian lose 1.03kg more weight on average than those who engage with standard care [20].

However, at present, the research regarding the practitioner's role in weight loss and weight loss maintenance is primarily based on the study of dietitians and is also centred on the role of contact frequency. A positive relationship between the frequency of contact between the client and practitioner, and successful weight loss and weight loss maintenance is noted in previous research [16]. Individuals that received more frequent contact with their practitioner have greater weight loss compared to those with less frequent contact [15]. The importance of the role of the practitioner in client weight loss is clear in the literature; however, further research should be conducted on non-dietitian practitioners who may be sought out more often by those seeking to lose weight.

While a dietitian is arguably the most appropriate practitioner for those seeking weight loss, only 10% of individuals recruit a health professional when told they need to lose weight [21]. Personal trainers are oftentimes a first point of call for those seeking weight loss and are often expected to provide nutritional care, sometimes beyond their scope of practice [22]. Likewise, sports coaches are oftentimes approached by athletes as a source of nutrition guidance; however, in most scenarios, nutrition advice is not usually part of coaches' training and therefore is beyond their scope of practice. For example, research by Zinn and colleagues [31] found that New Zealand premier club rugby coaches were unable to provide sufficient nutrition advice and further nutrition education would be of benefit to coaches. Ultimately, there is insufficient information on non-dietitian nutrition practitioners who may regularly engage with weight loss clients. Therefore, further research should be conducted on

the efficacy of non-dietitian nutrition coaches, such as personal trainers and sports coaches, that may be approached for guidance surrounding nutrition.

Practitioners play an important role in successful weight loss maintenance; however, very little research exists specifically on online nutrition coaches. Moreover, minimal research has been conducted on these coaches' perspectives, approaches, qualifications, and experience, and the relationship of these variables to their success. Therefore, the purpose of the current study was to investigate the demographic characteristics, experience, qualifications, details of client interactions, domains of focus, and self-reported client weight loss maintenance success rates via an anonymous survey given to a specific cohort of online nutrition coaches who work with weight loss clients. Notably, a population of coaches that received relatively uniform, evidence-based training for nutrition, but who differed by education level, type, and experience was targeted. It was hypothesised that this cohort of coaches, specifically, would take a holistic approach, focusing on domains beyond just nutrition. It was believed that other domains such as psychology, mindfulness, exercise, sleep and stress management and goal-setting would also be of importance in weight loss maintenance. Further, it was hypothesised that those with higher self-reported client success rates of weight loss maintenance would be those with more experience, and have more, or higher levels of nutrition specific qualifications. The aim of this study was to investigate the characteristics of online nutrition coaches, specifically evaluating the relationship between coaching variables and the coaches' perceived weight loss maintenance success rates.

3.2 Methods

3.2.1 Study Design

In this cross-sectional, observational study, coaches from the Diet Doc LLC and NAMS (National Academy of Metabolic Sciences) graduates were invited to complete an anonymous online survey. The survey consisted of 18-20 closed answer questions under the following subheadings: (a) demographic data, (b) coaching background, (c) client-practitioner interaction, and (d) domains. Self-reported weight loss maintenance success rates were reported by the respondents as their best estimation of the percentage of their weight loss clients who maintain at least 5% weight loss for 1 year or longer. The survey ([Appendix B](#)) was conducted using Qualtrics software (Qualtrics, Provo, UT) and included multiple choice and Likert scale questions. The study was approved by the Auckland University of Technology Ethics Committee (22/10) and all subjects provided informed consent upon commencing the survey.

3.2.2 Participants

The survey participants were current or former Diet Doc LLC coaches or NAMS graduates. The Diet Doc LLC is a US-based nutrition coaching company that provides an evidence-based coaching framework for coaches to use when providing nutrition guidance to clients. Coaches have access to a multidisciplinary support team of medical doctors, dietitians, strength and conditioning coaches, and mental health specialists to ensure access to and understanding of current best practices. NAMS is the Diet Doc LLC's online education certification that any fitness professional, within or outside the Diet Doc, can take. Inclusion criteria were being a current or former Diet Doc LLC coach or NAMS graduate, being 18 years or older, and working primarily with weight loss clients. An email with an attached informational flyer was

sent to the entire database of Diet Doc LLC coaches and NAMS graduates, inviting them to participate if they met the inclusion criteria. Additionally, recruitment flyers were posted on the company's associated social media pages.

3.2.3 Data Analysis

Quantitative data were analysed using JASP software (Jeffreys's Amazing Statistics Program, version 0.16.1; University of Amsterdam, Netherlands). Collected data were screened for duplication, incomplete answers, and responses that did not meet the inclusion criteria, and these data were removed. Descriptive statistics were reported as frequencies and percentages to understand the demographic data of the sample and to understand the frequency at which majority of the sample used each domain and frequency of check-in. The rates, as a percentage of weight loss clients who maintain at least 5% weight loss for 1 year, of coach-reported successful weight loss maintenance were measured. Separate Spearman correlations were performed to test the hypotheses that the coaches' education level and years of experience impact these rates. A Mann-Whitney U test was performed to compare the difference between the number of nutrition qualifications and successful weight loss maintenance in clients. The final planned analysis was to compare coaches who were currently or previously working under the Diet Doc LLC to those who were not Diet Doc LLC coaches but had a NAMS certification. A t-test, or non-parametric equivalent analysis if the data were non-normal, was planned. However, due to the low sample size, with an insufficient number of responses from Diet Doc LLC coaches ($n = 3$), this analysis was not performed.

The data for these comparisons did not meet assumptions of normality; thus, non-parametric analyses were performed. Significance was set at $p = 0.05$. Two separate

Spearman correlations were used to determine the association between coaching qualification level, as well as the coaches' years of experience with coach-perceived successful weight loss maintenance rates. Further, due to the data being skewed and peaked (kurtosis), a Mann-Whitney U test was used to investigate whether there was a difference between coaches with more or fewer nutrition qualifications in their coach-perceived successful weight loss maintenance rates.

3.3 Results

3.3.1 Participants

The survey was completed by 16 participants; however, 2 participants were removed from the data due to incomplete responses. Of the 14 included participants, 35.7% were male and 64.3% were female. The mean age was 34.8 ± 6.4 years [range 25-54]. 7.1% were Diet Doc LLC coaches, 78.6% were NAMS qualified coaches, and 14.3% were both. The ranges of coach-perceived rates of successful weight loss maintenance are shown in Table 1. The general and nutrition-specific education levels of the sample as well as their professional backgrounds are included in Tables 2 and 3 below, respectively. Finally, the frequencies that the respondents discussed each coaching domain with weight loss clients are included below in Table 4, and the client check in frequencies are reported in Table 5.

Table 1. Coach-perceived rate of successful weight loss maintenance

% of clients maintaining weight loss	Count n (%) of coaches
0	1 (7.1)
10	1 (7.1)
50	3 (21.5)
60	1 (7.1)
70	3 (21.5)
75	3 (21.5)
80	2 (14.2)

Table 2. Count n (%) of level of education and nutrition education

	Highschool graduate	Diploma or associates	Bachelors	Masters	PhD
Highest educational degree	1 (7.1)	2 (14.2)	8 (57.1)	2 (14.2)	1 (7.1)
Highest nutritional degree	-	6 (42.9)	1 (7.1)	1 (7.1)	-

Table 3. Count n (%) of professional background

Personal trainer	2 (14.2)
Nutrition coach	5 (35.8)
Health coach	2 (14.2)
Non-fitness or health related	5 (35.8)

Table 4. Frequency n (%) of domains discussed with clients

	Never	Not often	Sometimes	Frequently	Always
Training	-	-	2 (14.2)	6 (42.9)	6 (42.9)
Mindfulness	-	1 (7.1)	1 (7.1)	4 (28.7)	8 (57.1)
Psychology	1 (7.1)	-	1 (7.1)	5 (35.8)	7 (50.0)
Goal setting	-	1 (7.1)	1 (7.1)	6 (42.9)	6 (42.9)
Sleep and stress management	-	-	2 (14.2)	5 (35.8)	7 (50.0)

Table 5. Frequency n (%) of check-ins

Daily	1 (7.1)
Twice a week	1 (7.1)
Weekly	12 (85.8)

3.3.2 Relationship of education level with coach-perceived successful weight loss maintenance

There were no significant relationships between coach-perceived weight loss maintenance success rates and education. Specifically, the level of general education had a non-significant, negative relationship ($\rho = -0.38$, $p = 0.18$), while the level of nutrition-specific education had a non-significant, positive relationship ($\rho = 0.19$, $p = 0.53$) with coach-perceived weight loss maintenance success rates.

3.3.3 Relationship of experience with coach-perceived successful weight loss maintenance

No significant relationships were found between years of experience and coach-perceived weight loss maintenance success rates. Specifically, a weak, negative, non-significant relationship was observed ($\rho = -0.15$, $p = 0.61$).

3.3.4 Comparison of coach-perceived successful weight loss maintenance by qualification number

The data were quite skewed and peaked (kurtosis); therefore, a Mann-Whitney U test was used to investigate the difference between the number of nutrition qualifications and successful weight loss maintenance in clients. No significant difference ($U = 31.0$, $p = 0.12$, 95% CI = $-0.05-0.86$) was found for coach-perceived weight loss

maintenance success rates between coaches with 1 or less (Mdn = 72.5, n = 8), or 2 or more nutrition qualifications (Mdn = 50, n = 5).

3.4 Discussion

The purpose of this investigation was to investigate the demographic characteristics, experience, qualifications, details of client interactions, domains of focus, and self-perceived client weight loss maintenance success rates in a specific cohort of online nutrition coaches who work with weight loss clients. Based on the existing literature surrounding client-practitioner interaction, it was believed that more frequent interactions would be common practice amongst the coaches. It was further hypothesised that coaches with higher levels of nutrition-specific education, but not necessarily general education, would have higher self-perceived client success rates for weight loss maintenance. It was also hypothesised that coaches with more years of experience and more nutrition qualifications would perceive that a higher percentage of their weight loss clients maintained their weight loss. Pertaining to the domains discussed with clients, it was hypothesised that coaches would take a holistic approach to their coaching and oftentimes address other domains such as mindfulness, sleep and stress management, psychology, and goal setting with their clients. Generally, our hypotheses about the coaching domains and contact frequency with clients were supported by the demographic data of this cohort; however, it was challenging to test our hypotheses about the relationship of experience, education, or qualification level with self-perceived client weight loss maintenance success due to the lower than anticipated sample size. Therefore, the specific hypotheses related to the associations of education, experience, and qualifications with self-perceived success were not supported.

When asked about their perceived rates of weight loss maintenance success with their clients, the majority of the coaches in this study (85.8%) indicated that greater than 50% of their clients maintained their weight loss for over one year. In fact, 25.7% of this cohort noted that more than 75% of their clients maintained their weight loss. In terms of general education level, a bachelor's degree was the most common amongst the participants (57.1%), while many of the respondents (42.9%) indicated that their highest nutritional education achieved was at the diploma or associate's level. Of note, the professional backgrounds of the coaches in this study were most commonly nutrition coach or non-fitness or health related (35.8% each), and only 14.2% of participants had a personal training background. A high number of participants in this study indicated that they always discussed mindfulness with their clients (57.1%). Further, 50% of the coaches stated that psychology and sleep and stress management were domains that they would always discuss with clients. Overall, most of the respondents indicated that they take a holistic approach with weight loss clients, either always or frequently discussing other domains outside of nutrition, such as training, mindfulness, psychology, sleep and stress management, and goal setting.

Regarding the frequency of client contact, most respondents (85.8%) noted that client check-ins were performed on a weekly basis. However, it is possible that additional contact occurred outside of formal weekly check-ins. Indeed, three coaches from the same cohort who were interviewed in Chapter 4 noted that while formal check-ins were weekly, they also provided support and interacted with their clients between check-ins as needed. The literature agrees that frequent client-practitioner contact is important in successful weight loss maintenance [15]. In their meta-analysis, Schippers and colleagues [15] noted that more frequent interactions had a positive effect on weight loss. Studies with more than one interaction per day had an effect size

of $d = -0.36$ ($p < 0.01$), whereas those with less than 0.6 interactions per day had an effect size of $d = -0.07$ ($p = 0.514$) [15]. Similarly, more frequent supportive text messaging has a positive effect on weight lost, with individuals receiving the most texts losing 1.9kg ($p = 0.02$) more than those receiving fewer [56].

It was hypothesised that educational level, specifically nutrition education, would have a positive relationship with perceived client weight loss maintenance success rates. The findings of this study were unclear which could have been due to the small sample size, or a lack of an actual association. Interestingly, while not significant, there was a negative relationship between general education level and self-perceived client weight loss maintenance success rates. Similarly, in a larger study Melton and colleagues [24] noted, when providing a nutrition knowledge test to personal trainers, that there was no significant relationship between nutritional knowledge of personal trainers and their level of general education ($F = 1.87$, $p = 0.16$). Likewise, in the present analysis there was not a significant relationship between nutrition education level and self-perceived client weight loss maintenance success rates either. Once again, this may have been due to a small sample; however, the directionality of the relationship between nutritional degree level and perceived success rates was positive rather than negative, more in line with the hypothesis that nutrition education level would have a positive relationship with perceived success rates. Again, the results were not significant, but the importance of nutritional education has been highlighted in the literature and indicates, that in some cases, the practitioners that are approached for nutritional guidance, may not be the most qualified to do so [31]. For example, Zinn and colleagues [31] noted that New Zealand premier rugby coaches are not adequately trained to provide nutrition guidance, yet they are often approached by athletes to do so. Furthermore, a study on US university

athletes found that only 58.2% had access to a dietitian [62], reinforcing the importance of further nutritional education among non-dietitian practitioners such as sports coaches and strength and conditioning coaches. Finally, personal trainers are regularly engaged by clients desiring weight loss and thus, may be expected to provide nutritional guidance, which in some contexts, exists outside their scope of practice [22] Despite the lack of a clear association in our results, further research should be undertaken to understand the relationship between coaches' general educational level and nutrition education and client rates of weight loss maintenance success.

According to the literature, dietitians that undertake continuing professional education improve their competence [64]. While one might expect a difference in success between those with higher and lower qualifications, there did not appear to be a significant difference in perceived success between coaches with two or more or one or fewer nutrition qualifications. As with the other statistical analyses, the low sample size makes it unclear as to whether this is a generalisable finding. However, as mentioned previously, while Melton et al. [24] found no significant impact of general education on nutrition knowledge, they did report that fitness professionals with a nutrition certification had significantly higher scores on a nutrition knowledge test than those without such certifications (18.2 ± 2.0 correct answers out of 21 versus 17.1 ± 1.9 , $p = 0.04$). Similarly, it was hypothesised that coaches with more years of experience would report higher rates of self-perceived weight loss maintenance success among clients, but once again, there was no significant relationship found between experience and self-perceived success. However, Melton and colleagues [24] also reported slightly higher scores among trainers with more than 10 years of experience compared to those with less than 10 years (17.6 ± 1.7 versus 16.8 ± 2.0), although these findings did not quite reach the threshold for significance ($p = 0.06$).

Unfortunately, both the present study and the study by Melton and colleagues have small sample sizes, and therefore, further research looking specifically at the role of nutrition specific education and experience on client success, rather than the role of general personal training experience and education, is required.

Finally, it was hypothesised that the type of qualification would influence the rates of perceived successful weight loss maintenance. It was expected that coaches in the Diet Doc LLC franchise might have higher rates of success as they have access to ongoing coaching support. However, as noted previously, due to a low sample size and an insufficient number of Diet Doc coach responses ($n = 3$), this analysis was not performed. Further research should be conducted on understanding the relationship between coaches with nutrition qualifications versus those with a support network like that in the Diet Doc LLC, and the effect that this may have on the client weight loss maintenance success.

3.5 Limitations

Due to the limited sample size in this study, the findings may not generalise to the broader populace of nutrition coaches this sample represents. Indeed, previous research indicates that nutrition specific education and experience may be important factors for trainers and coaches. Further, as noted previously, due to the small sample size, some analyses were omitted and could not be performed. Finally, client weight loss maintenance success rates were self-reported by the participants and thus, it is possible that these rates were not accurate depictions of true outcomes.

3.6 Conclusion

This study explored the demographic characteristics, experience, qualifications, details of client interactions, domains of focus, and self-perceived client weight loss maintenance success rates in a specific cohort of online nutrition coaches who work with weight loss clients. In particular, coaches' levels of qualification, nutrition qualifications, types of qualification, and years of experience were assessed for their influence on the rate of perceived success of client weight loss maintenance. Notably, the coaches overall had high rates of self-perceived success, with the majority of coaches believing that most of their clients successfully maintained weight loss. Additionally, among this cohort, there was a contact frequency of at least one check-in per week in all but one respondent, and all coaches took a holistic approach to the domains of coaching outside of solely providing nutrition guidance. Generally, both practices are supported in the literature as potentially having a positive impact on weight loss maintenance success. With that said, when evaluating experience, education (both general and nutrition-specific), and qualifications, no significant findings were observed, making further inferences challenging.

This study is the first to report the demographic characteristics, self-perceived weight maintenance success rates, frequency of contact, and domains of coaching focus among non-dietitian nutrition coaches who are aware of and attempting to follow current best practices. However, further research is required to characterise this cohort of nutrition coaches, the broader population of nutrition coaches, and to gain greater understanding of what improves client weight loss maintenance success rates, and what other practices should be implemented to improve weight loss outcomes for nutrition coaching clients.

Chapter four: A qualitative analysis of client-practitioner relationships and practitioner beliefs related to successful weight loss maintenance in clients

Preface

Participants in the survey (Chapter 3) indicated that frequent interactions and a holistic approach to weight loss coaching were common practice among coaches with higher client weight loss success rates. These findings aligned with the current literature on weight loss maintenance, warranting further qualitative exploration of client-practitioner relationships and practitioner beliefs among successful online coaches. Therefore, the purpose of Chapter 4 was to qualitatively explore these traits through semi-structured interviews with successful online nutrition coaches to better understand their perspectives on weight loss maintenance. Chapter 4 is also planned for submission to *the International Journal of Sport Nutrition and Exercise Metabolism*.

4.1 Introduction

Approximately 13% of adults over 18 years of age are currently with obesity in the world [2]. Not only does the likelihood of developing other serious health conditions such as type 2 diabetes, ischaemic heart disease, stroke, and several common cancers increase amongst those with obesity, but so does all-cause mortality [2, 3]. As such, many individuals with obesity seek to lose weight. While self-directed weight loss attempts may be successful, in many cases individuals will regain some, if not all, of their weight loss [5]. This is cause for concern as even mild rates of weight regain can regress biological health markers to their baseline measures prior to weight

loss [6-8]. Therefore, it is worth investigating the role of professional support during weight maintenance.

Indeed, research shows that engaging the help of a professional increases the likelihood of weight loss maintenance [9]. Supported dieters lose more body weight and experience greater decreases in body mass index and body fat percentage than their non-supported counterparts [30]. In most scenarios, a dietitian may be the most appropriate practitioner for these individuals; however, only 10% of these individuals actually engage with a health professional (including dietitians) when they are told weight loss is necessary [21]. Individuals seeking to lose weight will often recruit personal trainers and oftentimes expect them to provide nutritional care [22]. Hence, further research should be conducted concerning the efficacy of non-dietitian nutrition coaches and other related practitioners that may be approached by those seeking to lose weight and maintain their weight loss.

While there is some research available regarding the practitioner's role in weight loss and weight loss maintenance, there is a need for further, more in-depth research especially on non-dietitian nutrition coaches. The literature indicates that frequency of contact between the client and practitioner is key to successful weight loss and weight loss maintenance [16]. More frequent interactions have a positive relationship with greater weight loss [15]. However, most studies focus on the presence of contact, rather than its quality, as there is limited research available regarding the type of support successful weight loss practitioners provide. A "small changes" approach regarding diet, exercise and behaviour modification is popular among dietitians working with weight loss clients [17], but it is unknown if this is common practice among other professionals. Indeed, research indicates that the coaching style, including the degree of support and format of coaching, should be

adapted, and individualised to each client [18]. Differing practitioner approaches may have varying effects on clients' weight loss success. Acceptance-based behavioural treatments, such as supporting self-regulation skills and controlling aspects of life that can be controlled, were more effective for weight loss maintenance in the Mind Your Health project than other more commonly utilised, cognitive behavioural treatments, 31.6% versus 17.1%, $p = 0.04$ [19]. Thus, the practitioner has a significant influence on successful weight loss maintenance and their role should be further researched.

While practitioners play an important role in successful weight loss maintenance, very little research exists specifically on online nutrition coaches. Further, minimal research is available on practitioner-client relationship qualities and which practices are perceived to be important for successful weight loss maintenance among such professionals. Therefore, the purpose of the current study was to investigate these practitioner-client relationships and practitioner beliefs related specifically to successful weight loss maintenance in clients. It was hypothesised that a cohort of coaches who reported the rates of successful weight loss maintenance among their clients was high would employ the aforementioned "small changes" technique and would have regular, high-quality interactions with their clients.

4.2 Methods

4.2.1 Study Design

In this cross-sectional, qualitative study, coaches from the Diet Doc LLC and NAMS (National Academy of Metabolic Sciences) graduates were invited to participate in virtual semi-structured interviews. The aim of this study was to investigate the beliefs and practitioner-client relationships of online nutrition coaches, specifically addressing the key themes common amongst nutrition coaches who

reported that their clients successfully maintained their weight loss. An outline with the indicative questions was provided to the interview participants prior to the interviews. The following topics were included in the interview: (a) coaching background and experience, (b) experience with weight loss maintenance in clients, (c) interactions with clients, and (d) domains discussed with clients. The interviews were approximately 45 minutes and were conducted by the principal researcher (AN) using Zoom (Zoom Video Communications, California, USA) and audio recorded.

A copy of the indicative questions can be found in the appendix. The study was approved by the University Ethics Committee (22/10) and all subjects provided informed consent online before participating in the interview.

4.2.2 Participants

The interview participants were current or former Diet Doc LLC coaches or NAMS graduates. Inclusion criteria for participants were that they must be 18 years or older, work primarily with weight loss clients for a minimum of two years, and report that over 50% of their weight loss clients maintain a weight loss greater than 5% for a minimum of 1 year. The Diet Doc LLC was specifically chosen because of their network of health care professionals who provide support to coaches. This network includes registered dietitians, doctors, psychologists, and physical therapists. The Diet Doc LLC provides an evidence-based framework for their coaches to operate within, which is also taught in their NAMS nutrition coaching course, thus providing the study with a unique cohort of online nutrition coaches most likely to be aligned with current best practice for weight loss maintenance. An email with an attached informational flyer and participant information sheet was sent to Diet Doc LLC and NAMS coaches who met the inclusion criteria and opted to be contacted for interview.

4.2.3 Data Analysis

All interviews were transcribed using Amberscript (Amberscript B.V. transcription company, 2021, Amsterdam, Netherlands). The transcribed interviews were then checked by AN to ensure correct transcription. The interviews were then analysed using Braun and Clark's [65] method for thematic analysis. An inductive approach to thematic analysis was used where themes were developed from the data, and both semantic and latent features were analysed in the data. During the familiarisation phase, the interviews were listened to and read repeatedly by the researcher and initial themes were produced and coded for each. These themes were produced based on the common content across the interviews and the existing literature. These were then clustered together and revised according to their prevalence across all the data to test the value of describing patterns across the whole data set. Four key themes were found in the data and are presented below.

4.3 Results

Six participants indicated interest in participating in the interviews, four of which scheduled an interview. One participant withdrew from the study prior to being interviewed due to insufficient time to complete the interview, resulting in three interviews with online nutrition coaches being completed. The participants were all female and ranged in age from 30 to 65 years old. The amount of experience working as an online nutrition coach ranged from 4 months to 3 years among the participants; however, two of the three participants indicated they had been in the fitness industry as personal trainers or group fitness instructors for over 10 years. All three participants completed the NAMS qualification, and one was also a Diet Doc LLC licensee.

4.3.1 Building rapport

When asked what qualities they believed made a successful online nutrition coach, all participants emphasised that building rapport and trust with their clients was essential.

“Building that relationship... letting them know that they can trust me, they can trust me with whatever it is that’s either in their journey or in their lives” – J.

“If they don’t trust you, they don’t believe what you’re offering, they’re not going to adhere” – J.

It was noted by the participants that showing genuine care and interest in clients’ journeys was also important.

“That big care piece is what really makes the most difference” – E.

“Being caring, have some empathy for things in their life” – J.

The importance of a personalised client-practitioner relationship was also highlighted, with all participants indicating that the initial consult was key to building the relationship.

“I always have a Zoom meeting with them... so they know the person behind the screen, and I explain the program to them. I always explain the ‘why’ they’re doing something.” – M.

“Transparency that there’s a human on the other side of the screen... not just like a macro police” – M.

4.3.2 Support methods

All participants indicated that formal client check-ins were done once a week but that clients could contact their coach throughout the week with questions or any issues.

“I have several [clients] that talk on WhatsApp or texting or email me at any time. I pretty much make myself available whenever I can” – E.

“If they send me an email and may be in a panic mode about something, sometimes I’ll just say let’s jump on a [phone] call” – J.

The coaches interviewed all had a similar approach to the weekly check-ins with their clients. Aspects that were often addressed in such check-ins such as progress pictures, weight measurements, and food logs were included; however, the coaches interviewed also highlighted the importance of biofeedback, how the clients were feeling, and their ‘wins’ for the week.

“I always ask for two plus wins from the past week, and one has to be what I call an NSV, a non-scale victory. So, something you have learned about yourself or nutrition from the past week” – M.

“I want to know about sleep. I want to know about stressors. Whatever else is going on in their lives.” – J.

Similarly, one coach also mentioned that they ask if the client encountered any barriers during the week.

“Any challenges that I can help navigate?” – M.

The coaches all indicated they respond to the weekly check-in questions and reports with video responses or Zoom calls.

“They will send me documents from their week... I review all of that and we do a video format as my reply” – J.

4.3.3 Holistic approach

The participants all had a holistic approach when asked about the domains they discuss with clients. None of the participants indicated that they only provided nutrition guidance, as all participants addressed other domains such as training, mindfulness, sleep, and stress.

“Talk to them about setting up a sleep routine, what you can do if you’re feeling stressed in situations... how to incorporate that mindfulness and stepping away and utilising some self-care” – J.

“I feel like they all play into each other to really have that whole wellness aspect to life and to be at the highest that you can be, and feel the best that you can” – E.

One participant highlighted the importance of mindfulness within the success of clients’ weight loss maintenance.

“If their mindset, or just the level of awareness that they have around their actions and their food, if that’s shifted, even their physical results are then perceived so differently” – M.

While another participant emphasised the importance of psychology within their coaching.

“I feel like that psychological piece of it is so much for some people and that you can see that that reflects in their check-ins” – E.

The participants also indicated that often their coaching involved incorporating more than just nutrition guidance.

“There’s been very few clients that it’s strictly calories in, calories out. It’s more the relationship and the perceptions they have with food and themselves too” – M.

4.3.4 Goal setting approach

Goal setting also appeared to be a common theme among the coaches interviewed. While the practitioners noted large weight loss goals were common among clients, they highlighted that their approach usually involved helping clients break these goals into smaller, weekly goals to help them work towards the larger goal.

“I always talk about short term and long-term goals... whether it’s something like meal prepping or taking more time for themselves, or anything like that can be super small” – E.

“I have a path in which I think we can get them towards their goals... I do try to have those weekly steps to get them towards that ultimate goal... so whether it’s a step count or whether it’s a daily devotional or anything like that” – M.

One coach noted that they avoid setting large weight loss goals with their clients, but instead focus on how they feel each week and on measurable weekly progress.

“I don’t like to say ‘we’re going to lose 25lbs’ because then I feel like that’s putting stress on a situation or stress that they’re so focussed on that number. I want them to be focused about feeling good, growing, looking at their measurable results.” – J.

The participants seemed to agree that taking small steps weekly was the best approach to clients’ weight loss goals. When it came to stress management strategies, acceptance-based behavioural changes were employed by the participants.

“Like some of those factors you can’t control, and just finding acceptance around that... and saying ‘okay, let’s look at what we can control’” – M.

“Not necessarily change the stress that’s happening but if we can change our perception of the stress, the level of stress it implicates on our bodies and our minds, that’s such a game changer” – M.

4.4 Discussion

This study explored online nutrition coaches' perceptions of successful client-practitioner relationships and their beliefs about what leads to successful weight loss and weight loss maintenance among clients. The hypotheses were that these coaches would emphasise high-quality, frequent contact with their clients, and implement a "small changes" approach to goal setting and attainment. These hypotheses were supported; however, the participants also noted other aspects of their practice which may be of importance. Specifically, they noted the importance of developing rapport, adequate support, taking a holistic approach, and appropriate goal setting in a client's weight loss journey. Previous literature has shown the importance of these factors [15, 16, 18]; however, the current study further investigated the coaches' perceptions of their interactions and their role of supporting and encouraging these factors within their coaching relationships.

The coaches in this study agreed that building rapport with clients is a fundamental part of establishing trust and helping clients lose and maintain weight loss. Indeed, literature indicates that building rapport and empathy with clients is essential in weight loss interventions [66-68]. A personalised approach where every aspect of the dietitian's practice is formed by the client's need has been noted by Nagy et al. [69] to be a common approach amongst dietitians. Participants in this study highlighted that they try to ensure the initial consult is either face-to-face or over a video call to further build the client's trust. The importance of a face-to-face or video consult is also reiterated in the literature, which indicates that the medium of communication appears to improve the development of trust [69]. In a study by Wing et al.[70], those receiving face-to-face care regained less weight than those only engaging with a web-based form (2.5 ± 6.7 kg versus 4.7 ± 8.6 kg, respectively). The

participants in this study also stated that clear and transparent communication is key to developing rapport, e.g., the practitioner explaining the reasoning behind their approach. Nagy et al. [69] note this as a key theme in their study on client-dietitian relationships, stating that transparent communication and expectations minimises the likelihood of miscommunication that may hinder relationship development. The findings of this study reiterate the importance of the client-practitioner relationship and developing rapport.

The nutrition coaches in this study all agreed that formal, weekly check-ins with their clients are an appropriate frequency. However, they also indicated that they made themselves available for additional contact between formal check ins. Indeed, according to the literature, more frequent communication between the client and practitioner has a positive effect on weight loss and weight loss maintenance [15, 16]. Indeed, in a study by Coates et al. [16], the only group that showed a significant decrease in and subsequent maintenance of their weight loss after 6 months was the group that received daily contact rather than weekly, as the percentage of overweight participants in this group dropped from 37.3% to 29.3% ($p < 0.04$). Moreso, establishing open communication between check-ins is also noted in the literature to further improve the client-practitioner relationship as the client perceives the practitioner as approachable and supportive [69]. The value of this open line of communication is echoed as a commonly utilised approach in the literature, as Nagy and colleagues note that doing so has the potential for “enabling clients to feel comfortable instigating communication with the dietitian, as it allows the client to perceive their dietitian as approachable and supportive” [69]. Based on the findings of this study and in the literature, it would appear that frequent check-ins (weekly or

more) are advisable for nutrition coaches working with clients seeking long-term weight loss maintenance success.

The participants in this study also agreed that a holistic approach should be taken with weight loss clients, and that their coaching was not limited to nutrition. For example, sleep management was highlighted, as the coaches discussed sleep routines and how to improve sleep habits with their clients. The literature supports the importance of sleep in weight loss, as sleep deprivation can negatively affect appetite control and metabolic rate [71]. According to Thomson and colleagues [72], women who reported less than 7 hours of sleep per night were significantly less likely to experience successful weight loss than those that reported greater than 7 hours of sleep (44.4% versus 55.6%; Risk Ratio, 0.70, 95% CI, 0.54–0.91). Similarly, participants sleeping 8.5 hours per night had losses of fat-mass 60% higher (2.4kg versus 1.5kg, $p = 0.04$) than those sleeping 5.5 hours in a study by Nedeltcheva et al. [73]. From a psychological perspective, the client's relationship with food and perceptions of themselves were also considered important factors for weight loss maintenance by the coaches in this study. Elfhag and Rossner agree, as they reported that higher self-esteem is positively related to longer weight loss maintenance [36]. According to Nir and Neumann [74], higher self-esteem is associated with longer periods of weight loss maintenance ($r = 0.21$, $p < 0.05$). The coaches in this study also commented on the importance of managing stress for successful weight loss, which is also supported by the research of Elfhag and Rossner as they reported individuals able to cope with stressors were more likely to sustain their weight loss [36]. Indeed, this is not an isolated finding, as Jeffery and colleagues [75] reported those with higher emotional self-efficacy were more likely to maintain greater amounts of weight loss than those with lower self-efficacy (7.4kg versus 4.2kg; $p < 0.05$).

In addition to highlighting the importance of relationship quality and factors outside of nutrition, the participants indicated that helping clients set appropriate goals and helping them approach goals in a stepwise fashion was critical during weight loss and weight maintenance phases. Specifically, the coaches explained how they helped their clients break large weight loss goals down into smaller, more manageable goals or into weekly goals. This is similar to the ‘small changes’ approach noted in the literature as a favoured method used amongst dietitians [17]. The participants also expressed the importance of acceptance for stress management and that they encouraged self-regulation by controlling those aspects of life that their clients are able to control. These approaches mirror the acceptance-based behavioural treatments which were significantly more effective in supporting weight loss maintenance at 2 years post-treatment in the Mind Your Health Project compared to those receiving standard behavioural treatment (ABT = 25.0% versus SBT = 14.4%, $p = 0.07$) [19]. In the Mind Your Health Project, acceptance-based behaviours were described as self-regulation by controlling what participants could and accepting what they could not control [44]. In this study the participants indicated a similar approach;

“Not necessarily change the stress that’s happening but if we can change our perception of the stress, the level of stress it implicates on our bodies and our minds, that’s such a game changer” – M.

4.5 Limitations

It must be noted due to the small sample size in this study, that the findings may not be representative of all nutrition coaches. Further, as this study is qualitative in nature, it is not known if the reported themes will improve weight loss maintenance; however, each theme presented has quantitative support in the literature. The current study shows that this sample of nutrition coaches use a number of evidence-based approaches. Further research is required to gain understanding on how representative these findings are amongst the broader population of online nutrition coaches, and what other practices should be implemented to improve weight loss outcomes for nutrition coaching clients.

4.6 Conclusion

This study explored the perceptions of online nutrition coaches related to successful weight loss maintenance. Specifically, the interviews explored practitioner beliefs about the importance of practitioner-client relationships and their qualities, and the practices and methods related to weight loss maintenance success. Four key themes emerged which included, 1) the importance of building rapport with clients via initial and continued video calls to improve trust and the client-practitioner relationship; 2) a high frequency of contact via regular check-ins with additional “as needed” contact between check-ins to further build trust and strengthen the relationship; 3) a holistic approach to guidance beyond just nutrition that encompasses sleep and stress management, training, psychology, and mindfulness; and 4) an emphasis on goal setting that aimed to break down large weight loss goals into smaller, more

manageable goals. Practitioners are recommended to use a holistic approach with weight loss maintenance clients, and it is recommended that a high level of rapport is established through frequent interactions with clients.

Chapter five: Conclusion

5.1 Summary

The purpose of this dissertation was to understand the associations, traits, and qualities that may make an online nutrition coach more likely to have success with their weight loss maintenance clients. In order to answer this question, it was first necessary to understand the obesity epidemic, the influence that practitioners have on weight loss and weight loss maintenance and the different types of practitioners that are likely to be approached by those seeking weight loss (Chapter 1).

Following this introduction, a narrative review of the literature delved further into the consequences of the obesity epidemic, defining weight loss maintenance and the consequences of unsuccessful weight loss maintenance (Chapter 2). This chapter also investigated the current literature on the role that practitioners have in the weight loss process, and who are the practitioners that are often approached by individuals seeking weight loss. The literature indicated that individuals who seek out the support of a practitioner were likely to lose more weight than those who choose to do it on their own [30] and were also more likely to maintain their weight loss [9, 11, 13]. It was also highlighted in the literature that frequency of client-practitioner contact had an impact on weight loss maintenance success, with more frequent contact oftentimes resulting in better weight loss and weight loss maintenance [15, 16, 43], and that acceptance-based behavioural treatments led to more successful weight loss [19]. The literature also indicated that dietitians are not the only practitioners sought out by those seeking weight loss [63] and therefore further research should be conducted on these other practitioners.

Having established the current literature regarding weight loss maintenance and the practitioners role within it (Chapters 1-2), the next step was to gather

quantitative data from online nutrition coaches. A survey was conducted with Diet Doc LLC and NAMS online nutrition coaches and the findings were produced in Chapter 3. Most of the participants in this study (85.8%) reported that more than 50% of their clients maintained their weight loss (at least 5% of bodyweight for 1 year or longer). However, in the literature, the most optimistic rates suggest that even in the presence of continuous support, only 50.3% of those seeking weight loss maintain it, and without this support success rates drop to 35.7% [43]. In addition, when looking at more long-term weight maintenance, some data indicate that only 28.6% of women and 23% of men maintain their weight over ten years [41]. Therefore, further research is required to understand if the high rates of successful weight loss maintenance observed in Chapter 3 are due to the approaches used by the coaches in this study, or if these rates were overestimated by the participants. Most of the respondents also indicated that they took a holistic approach to weight loss, almost always discussing other domains such mindfulness, psychology, sleep and stress management, and goal setting with their clients. Frequent check-ins were also noted by the coaches in this study with 85.8% of them indicating that they had at least weekly check-ins.

Although the statistical analyses of Chapter 3 were unclear, likely due to an unexpectedly low response rate, there appeared to be a weak positive relationship between the coaches level of nutrition qualification and their perceived client weight loss maintenance success rate, but this relationship with success rates was negative when correlated with general education. Again, while these were non-significant associations, there is some support for such findings in the literature, as Melton and colleagues noted that general education level of personal trainers did not have a significant effect on their nutritional knowledge test scores, however those with a nutrition specific certification did score significantly higher [24]. Finally, there was

also no significant relationship between a coach's years of experience and the rate of self-reported client weight loss maintenance success. Ultimately, however, it is unknown if these are representative relationships given the small sample size. Nonetheless, according to the results of this survey, the participants did follow evidence-based practice as they not only took a multi-faceted approach to coaching, but they also scheduled client check-ins on at least a weekly basis. More frequent interactions with clients have been noted in the literature to have a positive effect on weight loss [15, 16, 43].

The second investigation consisted of qualitative research conducted in the form of semi-structured interviews with several coaches from the same cohort (Chapter 4). Four key themes emerged from these interviews: building rapport, support methods, a holistic approach, and goal setting approaches. Building rapport, especially in the initial consults, appeared to be a fundamental part of the coaches' practice in this study. It was noted that showing genuine care, opting for video consults rather than email, and using a personalised coaching approach were key in establishing what the coaches felt were good client-practitioner relationships. The current literature supports their beliefs, as it highlights the importance of face-to-face meetings to build trust [69, 70]. The participants in this study also noted weekly check-ins were important to the success of their clients. All of the coaches interviewed also noted that outside of weekly formal check-ins, additional contact between check-ins was important to support their clients. As mentioned previously, there is support in the literature for the importance of more frequent client-practitioner interactions, as they have a positive effect on the weight loss success of clients [15]. A holistic approach was also highlighted in the qualitative component of this study. The importance of sleep, stress management, and mindfulness were all commented on by the coaches in

this study. Moreover, these domains are noted in the literature as having a positive influence on weight loss success [71, 72]. Finally, goal setting was addressed by all of the coaches in this study as a key part of their coaching practice. The coaches agreed that breaking larger goals into smaller, weekly goals benefitted their clients. This is similar to the ‘small changes’ approach previously mentioned in the literature as a favoured approach used by dietitians [17].

The quantitative and qualitative studies above helped answer the research questions for this dissertation. Quantitative research was undertaken to determine whether coaching qualification level or having more nutrition qualifications was associated with better client weight loss success rates in a specific cohort of online nutrition coaches. Further, the influence of years of coaching experience on the rates of self-perceived client weight loss maintenance success was also assessed. Finally, it was planned to assess whether being a Diet Doc LLC practitioner or not (i.e., the role of multi-disciplinary support) made a difference on perceived weight loss success rates compared to only having nutrition specific training without support (i.e., NAMS certification only). Unfortunately, an insufficient response rate occurred making this last comparison impossible. While the statistical analyses of the survey were not significant, the direction of the relationships were supported by the literature and the perceived success rates were very high, which should prompt additional study. To complement the surveys, the semi-structured interviews provided qualitative insight into the key themes common amongst this cohort of generally successful weight loss maintenance coaches. Four key themes were deduced, and these were all strongly supported by the existing literature.

Overall, these investigations helped explore several aspects of the client-practitioner relationship, and how they influence weight loss maintenance success rates in a sample of online nutrition coaches.

5.2 Limitations and future research directions

There are several limitations to this research. Firstly, one of the biggest limitations was the limited participant numbers in both the interviews and the survey. Due to receiving fewer survey responses than initially anticipated, the statistical power of the quantitative data presented in Chapter 3 was limited. Therefore, it is difficult to interpret whether the lack of associations observed are representative of the sample, or a product of underpowered tests. Furthermore, while Chapter 4 reported the themes of the qualitative interviews, only 3 participants were interviewed and so, the findings may not reflect those of a larger population of coaches. The cross-sectional nature of this research should also be noted as a limitation. Due to its nature, this research only explored the client-practitioner relationship at one point in time, not longitudinally, therefore it does not allow for an understanding of change over time and limits the ability to interpret how the practitioner's approach to aiding weight management clients may change over time. In future research, a longitudinal approach to data collection may be worthwhile considering to assess how the client-practitioner relationship and the practitioner's approach may change over time. Another limitation of this research was the key outcome measure used in the study. The rate of client weight loss maintenance success was reported by the coaches, rather than a validated outcome. As these measures are self-reported they may or may not be an accurate depiction of the true success rates of the coaches. In addition, the coaches that participated in the interviews were all female coaches and therefore it is possible that

different themes may have emerged had male coaches been interviewed as well. Future research in this area should aim to have a larger sample size with a mix of male and female respondents.

To develop a better understanding of what makes a successful online nutrition coach, further longitudinal studies should be conducted to understand how coaches change their approaches over time, with measures taken at the beginning of client weight loss, once the goal weight is achieved, and after weight loss has been maintained for over one year. The literature reviewed herein, the demographic characteristics of nutrition coaches, and the themes embodied in their coaching can all serve to guide which variables are assessed in such future research.

5.3 Practical implications

Despite the limitations of small sample size, cross-sectional study design, self-reported outcome measures (Chapter 3 and 4), and only female participants (Chapter 4), when considering the current research within the broader literature surrounding weight loss maintenance, the following recommendations can be tentatively suggested for coaches seeking to help their clients maintain weight loss long-term:

- The client-practitioner relationship should be emphasised with a focus on developing rapport through high quality, personalised, face-to-face contact.
- Practitioners should focus on frequent communication and interaction with clients to develop open communication and trust.
- Practitioners should employ a holistic approach to weight loss, taking into account sleep and stress management, mindfulness and psychology, and

goal setting approaches, rather than focusing solely on nutritional guidance and physical activity.

- Acceptance-based approaches to coaching may improve long-term adherence and ultimately, weight loss maintenance outcomes.
- Pursuing nutrition specific, rather than general education, may be important to help coaches improve their ability to help clients over time.

References

1. Blüher, M., *Obesity: global epidemiology and pathogenesis*. Nature Reviews Endocrinology, 2019. **15**(5): p. 288-298.
2. World Health Organisation. *Obesity and overweight*. 2021 [cited 2022 21 February]; Available from: <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>.
3. Borrell, L.N. and L. Samuel, *Body mass index categories and mortality risk in US adults: the effect of overweight and obesity on advancing death*. Am J Public Health, 2014. **104**(3): p. 512-9.
4. Spieker, E.A. and N. Pyzocha, *Economic Impact of Obesity*. Prim Care, 2016. **43**(1): p. 83-95, viii-ix.
5. Poobalan, A., et al., *Effects of weight loss in overweight/obese individuals and long-term lipid outcomes - a systematic review*. Obesity Reviews, 2004. **5**(1): p. 43-50.
6. Kroeger, C.M., K.K. Hoddy, and K.A. Varady, *Impact of Weight Regain on Metabolic Disease Risk: A Review of Human Trials*. Journal of Obesity, 2014. **2014**: p. 1-8.
7. Linna, M.S., et al., *Successful weight maintenance preserves lower levels of oxidized LDL achieved by weight reduction in obese men*. International Journal of Obesity, 2007. **31**(2): p. 245-253.
8. Márquez-Quñones, A., et al., *Adipose tissue transcriptome reflects variations between subjects with continued weight loss and subjects regaining weight 6 mo after caloric restriction independent of energy intake*. The American Journal of Clinical Nutrition, 2010. **92**(4): p. 975-984.
9. Iłowiecka, K., et al., *The Long-Term Dietitian and Psychological Support of Obese Patients Who Have Reduced Their Weight Allows Them to Maintain the Effects*. Nutrients, 2021. **13**(6).
10. Bachar, A., G. Livshits, and R. Birk, *Predictors of weight reduction and maintenance in a large cohort of overweight and obese adults in a community setting*. Nutrition & Dietetics, 2018. **75**(4): p. 390-396.
11. Voils, C.I., et al., *Maintenance of Weight Loss After Initiation of Nutrition Training*. Annals of Internal Medicine, 2017. **166**(7): p. 463.
12. Perri, M.G., et al., *Effect of length of treatment on weight loss*. J Consult Clin Psychol, 1989. **57**(3): p. 450-2.
13. Svetkey, L.P., et al., *Comparison of strategies for sustaining weight loss: the weight loss maintenance randomized controlled trial*. Jama, 2008. **299**(10): p. 1139-48.
14. Kim, J., S.K. Park, and Y.J. Lim, *Analysis of the Factors Affecting the Success of Weight Reduction Programs*. Yonsei Medical Journal, 2007. **48**(1): p. 24.
15. Schippers, M., et al., *A meta-analysis of overall effects of weight loss interventions delivered via mobile phones and effect size differences according to delivery mode, personal contact, and intervention intensity and duration*. Obesity Reviews, 2017. **18**(4): p. 450-459.
16. Coates, T.J., et al., *Frequency of contact and monetary reward in weight loss, lipid change, and blood pressure reduction with adolescents*. Behavior Therapy, 1982. **13**(2): p. 175-185.

17. Zinn, C., G. Schofield, and W.G. Hopkins, *Management of adult overweight and obesity: Consultation characteristics and treatment approaches of private practice dietitians*. Nutrition & Dietetics, 2013. **70**(2): p. 113-119.
18. Kleine, H.D., et al., *Barriers to and Facilitators of Weight Management in Adults Using a Meal Replacement Program That Includes Health Coaching*. Journal of primary care & community health, 2019. **10**: p. 2150132719851643.
19. Forman, E.M., et al., *Acceptance-based versus standard behavioral treatment for obesity: Results from the mind your health randomized controlled trial*. Obesity (Silver Spring), 2016. **24**(10): p. 2050-6.
20. Williams, L., et al., *How Effective Are Dietitians in Weight Management? A Systematic Review and Meta-Analysis of Randomized Controlled Trials*. Healthcare, 2019. **7**(1): p. 20.
21. de Heer, H.D., et al., *Only 1 in 10 Patients Told to Lose Weight Seek Help From a Health Professional: A Nationally Representative Sample*. American Journal of Health Promotion, 2019. **33**(7): p. 1049-1052.
22. Barnes, K., et al., *Clients expect nutrition care to be provided by personal trainers in Australia*. Nutrition & Dietetics, 2019. **76**(4): p. 421-427.
23. McKean, M., et al., *Are exercise professionals fit to provide nutrition advice? An evaluation of general nutrition knowledge*. Journal of Science & Medicine in Sport, 2019. **22**(3): p. 264-268.
24. Melton, B.F., et al., *The Influence of Education on the Nutritional Knowledge of Certified Fitness Professionals*. Int J Exerc Sci, 2021. **14**(4): p. 239-249.
25. Ministry of Health. *Obesity Statistics*. 2021; Available from: <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/obesity-statistics>.
26. Claessens, M., et al., *The effect of a low-fat, high-protein or high-carbohydrate ad libitum diet on weight loss maintenance and metabolic risk factors*. Int J Obes (Lond), 2009. **33**(3): p. 296-304.
27. Saarni, S.E., et al., *Weight cycling of athletes and subsequent weight gain in middleage*. International Journal of Obesity, 2006. **30**(11): p. 1639-1644.
28. Lowe, M.R., et al., *An Initial Evaluation of a Commercial Weight Loss Program: Short-Term Effects on Weight, Eating Behavior, and Mood*. Obesity Research, 1999. **7**(1): p. 51-59.
29. Blackburn, G.L., *Comparison of Medically Supervised and Unsupervised Approaches to Weight Loss and Control*. Annals of Internal Medicine, 1993. **119**(7_Part_2): p. 714-718.
30. Green, M.W., N.A. Elliman, and M.J. Kretsch, *Weight loss strategies, stress, and cognitive function: Supervised versus unsupervised dieting*. Psychoneuroendocrinology, 2005. **30**(9): p. 908-918.
31. Zinn, C., G. Schofield, and C. Wall, *Evaluation of Sports Nutrition Knowledge of New Zealand Premier Club Rugby Coaches*. International Journal of Sport Nutrition and Exercise Metabolism, 2006. **16**(2): p. 214-225.
32. Dixon, J.B., *The effect of obesity on health outcomes*. Molecular and Cellular Endocrinology, 2010. **316**(2): p. 104-108.
33. Studenski, S., et al., *Gait Speed and Survival in Older Adults*. JAMA, 2011. **305**(1): p. 50-58.

34. Park, K.-n. and S.-h. Kim, *Comparison of Grip Strength, Gait Speed, and Quality of Life Among Obese, Overweight, and Nonobese Older Adults: A Cross-sectional Study*. Topics in Geriatric Rehabilitation, 2022. **38**(1): p. 88-92.
35. Withrow, D. and D.A. Alter, *The economic burden of obesity worldwide: a systematic review of the direct costs of obesity*. Obesity Reviews, 2011. **12**(2): p. 131-141.
36. Elfhag, K. and S. Rossner, *Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain*. Obesity Reviews, 2005. **6**(1): p. 67-85.
37. Wing, R.R. and S. Phelan, *Long-term weight loss maintenance*. The American Journal of Clinical Nutrition, 2005. **82**(1): p. 222S-225S.
38. Marchesini, G., et al., *Long-term weight loss maintenance for obesity: a multidisciplinary approach*. Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy, 2016: p. 37.
39. Diabetes Prevention Program Research Group, *Reduction in the Incidence of Type 2 Diabetes with Lifestyle Intervention or Metformin*. New England Journal of Medicine, 2002. **346**(6): p. 393-403.
40. Jensen, M.D., et al., *2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults*. Circulation, 2014. **129**(25_suppl_2): p. S102-S138.
41. Kärkkäinen, U., et al., *Successful weight maintainers among young adults-A ten-year prospective population study*. Eat Behav, 2018. **29**: p. 91-98.
42. Karfopoulou, E., et al., *Dietary patterns in weight loss maintenance: results from the MedWeight study*. Eur J Nutr, 2017. **56**(3): p. 991-1002.
43. Look AHEAD Research Group, *Eight-year weight losses with an intensive lifestyle intervention: the look AHEAD study*. Obesity (Silver Spring), 2014. **22**(1): p. 5-13.
44. Forman, E.M., et al., *Long-Term Follow-up of the Mind Your Health Project: Acceptance-Based versus Standard Behavioral Treatment for Obesity*. Obesity (Silver Spring), 2019. **27**(4): p. 565-571.
45. National Task Force on the Prevention and Treatment of Obesity, *Dieting and the Development of Eating Disorders in Overweight and Obese Adults*. Archives of Internal Medicine, 2000. **160**(17): p. 2581.
46. Carraça, E.V., et al., *Psychosocial Pretreatment Predictors of Weight Control: A Systematic Review Update*. Obesity Facts, 2018. **11**(1): p. 67-82.
47. Teixeira, P.J., et al., *Journal of Behavioral Medicine*, 2002. **25**(6): p. 499-523.
48. Foster, G.D., T.A. Wadden, and R.A. Vogt, *Body image in obese women before, during, and after weight loss treatment*. Health Psychol, 1997. **16**(3): p. 226-9.
49. Foreyt, J.P., et al., *Psychological correlates of weight fluctuation*. International Journal of Eating Disorders, 1995. **17**(3): p. 263-275.
50. Viner, R.T., et al., *Energy Availability and Dietary Patterns of Adult Male and Female Competitive Cyclists With Lower Than Expected Bone Mineral Density*. Int J Sport Nutr Exerc Metab, 2015. **25**(6): p. 594-602.
51. Nose-Ogura, S., et al., *Risk factors of stress fractures due to the female athlete triad: Differences in teens and twenties*. Scand J Med Sci Sports, 2019. **29**(10): p. 1501-1510.

52. Dutton, G.R., et al., *Comparison of an alternative schedule of extended care contacts to a self-directed control: a randomized trial of weight loss maintenance*. International Journal of Behavioral Nutrition and Physical Activity, 2017. **14**(1).
53. Perri, M.G., A.M. Nezu, and B.J. Viegner, *Improving the long-term management of obesity: Theory, research, and clinical guidelines*. Improving the long-term management of obesity: Theory, research, and clinical guidelines. 1992, Oxford, England: John Wiley & Sons. xvi, 303-xvi, 303.
54. Perri, M.G., et al., *Extended-Care Programs for Weight Management in Rural Communities*. Archives of Internal Medicine, 2008. **168**(21): p. 2347.
55. Hollis, J.F., et al., *Weight Loss During the Intensive Intervention Phase of the Weight-Loss Maintenance Trial*. American Journal of Preventive Medicine, 2008. **35**(2): p. 118-126.
56. Fjeldsoe, B.S., et al., *Dose and engagement during an extended contact physical activity and dietary behavior change intervention delivered via tailored text messaging: exploring relationships with behavioral outcomes*. International Journal of Behavioral Nutrition and Physical Activity, 2021. **18**(1): p. 119.
57. Karmali, S., et al., *Clients' and Coaches' Perspectives of a Life Coaching Intervention for Parents with Overweight/Obesity*. International Journal of Evidence Based Coaching & Mentoring, 2020. **18**(2): p. 115-132.
58. Ko, J.Y., et al., *Weight loss advice U.S. obese adults receive from health care professionals*. Prev Med, 2008. **47**(6): p. 587-92.
59. Jackson, S.E., et al., *The impact of a health professional recommendation on weight loss attempts in overweight and obese British adults: a cross-sectional analysis*. BMJ Open, 2013. **3**(11): p. e003693.
60. Slater, G., B. Tan, and K.C. Teh, *Dietary Supplementation Practices of Singaporean Athletes*. International Journal of Sport Nutrition and Exercise Metabolism, 2003. **13**(3): p. 320-332.
61. Lun, V., et al., *Dietary Supplementation Practices in Canadian High-Performance Athletes*. International journal of sport nutrition and exercise metabolism, 2012. **22**: p. 31-7.
62. Torres-McGehee, T.M., et al., *Sports nutrition knowledge among collegiate athletes, coaches, athletic trainers, and strength and conditioning specialists*. J Athl Train, 2012. **47**(2): p. 205-11.
63. Florin, O., M. McKean, and B. Burkett, *Exercise Professionals - Could They Be The Forgotten Public Health Resource In The War Against Obesity?* Sports Medicine Doping Studies, 2012. **2**.
64. Martin, C., et al., *Dietitians' perceptions of the continuing professional development system in South Africa*. South African Journal of Clinical Nutrition, 2008. **21**(2): p. 27-33.
65. Braun, V. and V. Clarke, *Using thematic analysis in psychology*. Qualitative Research in Psychology, 2006. **3**(2): p. 77-101.
66. Rollo, M.E., et al., *Video Consultations and Virtual Nutrition Care for Weight Management*. Journal of the Academy of Nutrition and Dietetics, 2015. **115**(8): p. 1225-1220.

67. Hancock, R.E.E., et al., *'If you listen to me properly, I feel good': a qualitative examination of patient experiences of dietetic consultations*. Journal of Human Nutrition and Dietetics, 2012. **25**(3): p. 275-284.
68. Cant, R.P. and R.A. Aroni, *Exploring dietitians' verbal and nonverbal communication skills for effective dietitian-patient communication*. Journal of Human Nutrition and Dietetics, 2008. **21**(5): p. 502-511.
69. Nagy, A., et al., *Developing meaningful client-dietitian relationships in the chronic disease context: An exploration of dietitians' perspectives*. Nutrition & Dietetics, 2020. **77**(5): p. 529-541.
70. Wing, R.R., et al., *A Self-Regulation Program for Maintenance of Weight Loss*. New England Journal of Medicine, 2006. **355**(15): p. 1563-1571.
71. Papatriantafyllou, E., et al., *Sleep Deprivation: Effects on Weight Loss and Weight Loss Maintenance*. Nutrients, 2022. **14**(8): p. 1549.
72. Thomson, C.A., et al., *Relationship Between Sleep Quality and Quantity and Weight Loss in Women Participating in a Weight-Loss Intervention Trial*. Obesity, 2012. **20**(7): p. 1419-1425.
73. Nedeltcheva, A.V., et al., *Sleep curtailment is accompanied by increased intake of calories from snacks*. Am J Clin Nutr, 2009. **89**(1): p. 126-33.
74. Nir, Z. and L. Neumann, *Relationship among self-esteem, internal-external locus of control, and weight change after participation in a weight reduction program*. Journal of Clinical Psychology, 1995. **51**(4): p. 482-490.
75. Jeffery, R.W., et al., *Correlates of weight loss and its maintenance over two years of follow-up among middle-aged men*. Prev Med, 1984. **13**(2): p. 155-68.

Appendices

Appendix A: Ethics approval (Chapter 3 and 4)



Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

23 March 2022

Eric Helms
Faculty of Health and Environmental Sciences

Dear Eric

Re: Ethics Application: **22/10 The qualities of successful online nutrition coaches for weight loss maintenance**

Thank you for your responses to the conditions for the amendment to your ethics application..

The amendment to the recruitment protocol has been approved.

Standard Conditions of Approval.

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.
8. AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted. When the research is undertaken outside New Zealand, you need to meet all ethical, legal, and locality obligations or requirements for those jurisdictions.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through <http://www.aut.ac.nz/research/researchethics>

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: arielnadas@gmail.com

Appendix B: Questionnaire

Demographic data:

Age (years): *18-99*

Biological sex: *M/F*

Do you agree to be contacted for an interview? *Y/N*

If so, please provide your name and contact email address:

Coaching background:

Years as a nutrition coach: *1-99*

Level of qualification: *high school/diploma/bachelors/masters*

Type of training: *Diet Doc/NAMS*

Professional background: *personal trainer/sports coach/dietitian/non-fitness related*

Client-practitioner interaction:

Please read each of the following statements regarding your interactions with your clients and select the answer most reflective of your coaching practice.

1. Roughly, what percentage of your clients maintain a weight loss greater than or equal to 5% of body mass for a minimum of 1 year?
0-100%
2. How often do you check-in with your clients?
Daily/every two days/twice a week/weekly/fortnightly
3. What mode of delivery do you use with clients?
Online/face-to-face

Domains:

Please read each statement and select from the multiple choice options the frequency at which you discuss the following domains with your clients.

1. How often do you discuss nutrition?
Never (1)/ not often (2)/ sometimes (3)/ frequently (4)/ always (5)

2. How often do you discuss training?
Never (1)/ not often (2)/ sometimes (3)/ frequently (4)/ always (5)
3. How often do you discuss mindfulness?
Never (1)/ not often (2)/ sometimes (3)/ frequently (4)/ always (5)
4. How often do you discuss psychology?
Never (1)/ not often (2)/ sometimes (3)/ frequently (4)/ always (5)
5. How often do you discuss goal setting?
Never (1)/ not often (2)/ sometimes (3)/ frequently (4)/ always (5)
6. How often do you discuss holistic lifestyle approaches such as sleep and stress management?
Never (1)/ not often (2)/ sometimes (3)/ frequently (4)/ always (5)

Appendix C: Interview guide

Topic	Sample questions
Coaching background	<p>How many years have you been coaching in the Diet Doc franchise?</p> <p>Were you a nutrition coach beforehand?</p> <p>What level of qualification did you obtain prior to starting nutrition coaching?</p> <p>What professional background do you come from (personal trainer, dietitian, sports coach etc.)?</p> <p>Tell me about your client base.</p>
Experience with weight loss maintenance	<p>What percentage of your clients have maintained their weight loss (defined as maintaining at least 5% body mass loss for at least 1 year)?</p> <p>What qualities do you think makes a successful online nutrition coach?</p>
Client-practitioner interaction	<p>How frequently do you check-in with your clients?</p> <p>What mode of delivery do you use to interact with your clients?</p> <p>Tell me about the different tools you use to track, guide, and monitor client progress. Why do you use these methods?</p> <p>How do you build trust and rapport with your clients?</p> <p>How important do you think this is in a client's likelihood of achieving their goals and maintaining their weight loss?</p>
Domains discussed	<p>What domains do you discuss with your clients (nutrition, training, mindfulness, psychology, goal setting, holistic lifestyle approaches etc.)?</p>

How do you set goals with your clients?

Why do you think this goal setting
method works?

How significant is training to your
clients' weight loss maintenance?

How significant is mindfulness in your
clients' weight loss?

How significant is sleep and stress
management in your clients' weight loss?

Why do you believe these are important
in the success of your clients?