

**CARERS' INTENTIONS TO ENCOURAGE HEALTHY
DIET IN PEOPLE WITH A LEARNING DISABILITY:
THE APPLICATION OF THEORY OF PLANNED
BEHAVIOUR**

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at the University of Edinburgh



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ABSTRACT

Background: Unhealthy diet can have negative health consequences including heart disease, some forms of cancer and diabetes. Obesity is the most commonly recognised outward sign of an unhealthy diet. Steps are being taken to improve the health of the general population through encouraging healthy eating, however little has been done to tackle this issue in people with a Learning Disability and specific challenges exist when addressing this population. People with learning disabilities are increasingly living in community settings with support from care staff who have a large influence on their lives, including diet. The Theory of Planned Behaviour (TPB) is a model that has been used to examine many health behaviours with reference to underlying beliefs. This model has only recently been applied to proxy populations, i.e. with one group about the health behaviours of another. The purpose of the current project was to determine if the TPB was a useful predictor of care staff's intentions to encourage a healthy diet in their clients with a learning disability.

Method: 112 care staff from five voluntary or charitable organisations that provide support to people with learning disabilities were involved in the study and care staff from each completed a TPB questionnaire regarding their intention to encourage healthy eating over the next year for their clients.

Results: The results indicate that the Theory of Planned Behaviour is indeed applicable to this population. The variables which make up the original model of Theory of Planned Behaviour: attitudes, subjective norm and perceived behavioural control, were found to be statistically significant predictors of carers' intentions to encourage healthy diet in their client. Additional variables (self-efficacy and self-identity) were not found to improve the model.

Discussion: The current project provides evidence to suggest that the original model of TPB can be used to predict intention of carers to encourage a healthy diet in people with learning disabilities. As this is likely to have some impact on the healthy eating behaviour of people with learning disabilities, the TPB may help to inform

interventions to improve the overall health of this client group through improving their healthy eating behaviour. Further research should include the investigation of possible interventions, such as how to create a positive attitude in carers towards healthy eating for people with learning disabilities. Teaching on the contentious issue of duty of care and choice may be another important intervention for care staff. Other suggestions for further research are explored, such as investigating how the predictive power of the model can be increased when using it with this client group.

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1. INTRODUCTION

1.1 Overview

Eating an unhealthy diet can contribute to a variety of ill health consequences in particular obesity (World Health Organisation, 2003). This, in turn, is a risk factor for many chronic conditions and health problems, including increased risk of coronary heart disease, ischemic stroke, type 2 diabetes, osteoarthritis and breast, colon, prostate, endometrium, kidney and gallbladder cancers, as well as having a negative impact on life expectancy. While there tends to be a focus on obesity, being underweight also has associated health risks, in particular increased vulnerability to infection.

Many people with a learning disability have multiple and complex needs and yet are less likely to access appropriate health care (Prasher, 2003). One particular area of need is in relation to weight, as a greater proportion of people with a learning disability are underweight and overweight or obese than in the general population (Bhaumik *et al.*, 2008; Emerson, 2005). The prevalence of people with a learning disability who are underweight has been cited as between 10-43 per cent (The Scottish Executive, 2004) compared with 4 per cent in the general population (Department of Health, 1998). Similarly, levels of obesity are higher in people with a learning disability and have been cited as ranging between 10-56 per cent (The Scottish Executive, 2004) compared with an estimated 20 per cent in the general population (Royal College of Physicians, 2004) and 24.2 per cent in the Scottish population (The Scottish Executive, 2003). There is wide variation in these prevalence estimates, a point which will be discussed further later in the introduction.

There is a tendency for the research literature to focus on weight as an observable outcome of a poor diet, rather than on diet. Weight is one outcome measure that is taken as an indicator of the success or otherwise of health promotion projects. The focus on weight, and in particular on the growing problem of obesity, extends to the

research literature in relation to people with a learning disability, with very few publications examining healthy eating.

One way in which the UK and Scottish governments are currently attempting to improve the general health of the population is by encouraging uptake of a healthy diet (The Scottish Office, 2008; Department of Health, 2004). One influential model in examining change in health behaviours is the Theory of Planned Behaviour (TPB) (Ajzen, 1991, 1988), an extension of the Theory of Reasoned Action (TRA) (Fishbein, 1975). The TPB suggests that an individual's intentions to carry out a behaviour are affected by attitudes (their attitudes to the behaviour), subjective norms (the attitudes of those around them towards the behaviour) and perceived behavioural control (their perceived ability to have control over the behaviour). Researchers have used TPB to explore some of the factors which lead to poor diet and poor weight management in the general population (e.g. Povey, 2000), students (e.g. Bebetos *et al.*, 2002) and children (e.g. Berg *et al.*, 2000). The original model has been adapted by researchers in an attempt to improve its predictive validity (e.g. Armitage & Conner, 1999b; Paisley, 1998; Povey, 2000), although there remains debate about which, if any, additional variables can be said to do so. TPB has furthermore been subject to new research to examine whether the model can be applied to one group of people who have an impact on another group of people's behaviour. Only two studies have investigated this, both examining parents' intentions in relation to eating habits of children (Chambers *et al.*, 2007; Astrom & Kiwanuka, 2006). Both studies found that the TPB was predictive of parents' intention with regards to the eating habits of their children, suggesting that the attitudes, subjective norm, perceived behavioural control and differing additional variables in each study (such as self efficacy and self identity) of significant others can impact on diet.

This research is significant for people with a learning disability. Since community care policies were introduced, many people with a learning disability are supported by social care staff, who influence many aspects of the lives of those they support, including their diet (Dickson, 2002). The impact these carers can have on the lifestyles of those they provide care for, and the importance of encouraging them to

provide a positive influence has been recognised (Department of Health, 2001). Previous research has indicated that carers' own attitudes, beliefs and opportunities impact upon choice for the person they provide care for (Rodgers, 1998; Benzeval *et al.*, 1995; Jackson & Jackson, 1998). It seems likely therefore, that care staff may play a similar role with many people with a learning disability as parents do in relation to their children's diet. The present study, therefore aims to explore whether the TPB model can be used to predict carers' intentions to encourage clients with a learning disability to eat a healthy diet over the next year.

The thesis will begin by briefly outlining the diagnostic criteria for a learning disability and how this can affect areas such as informed client choice and the duty of care of staff both generally in relation to supporting clients and specifically in relation to diet. The role of carers in the lives of people with a learning disability will then be examined, again with specific relation to diet. This will be followed by a discussion of the research relating to diet, healthy eating and weight, in people with a learning disability and the relationship of this to general health and quality of life. This will be contrasted with research carried out with the general population. The introduction will then focus on research that has examined factors that influence diet and weight, before outlining the TPB in some detail and critically appraising the evidence for the model. This section will end by outlining the aims and hypotheses of the study.

1.2 Learning Disabilities

1.2.1 Definition of a Learning Disability

Although there may be some differences in wording, it is generally agreed that in order to be classified as having a learning disability, a person must be assessed and found to have significant impairment of intellectual functioning, significant impairment of adaptive and social functioning and to have had these impairments before adulthood (BPS, 2000; DSM-IV, 1994; World Health Organisation, 2007). Using these criteria, and specific cut-offs derived for this purpose, people are further

classified in terms of the severity of their learning disability. Commonly, they are classified as having a mild (IQ score 50 - 70), moderate (IQ score 35 - 49), severe (IQ score 20 - 34) or profound (IQ score below 20) learning disability. People who have significant cognitive and adaptive impairments may have problems understanding language and communicating. They are likely to have difficulties with concentration, and memory retention amongst other problems.

Both the term 'learning disability' and its subdivisions can be problematical (The British Psychological Society, 2000). Even when divided into subcategories, each covers a range of people with a wide variation in abilities and needs, from those who are almost completely independent, requiring only intermittent or limited support, to those who rely on others completely for support. This has implications for the care of these individuals, for example, people with profound learning disabilities are unlikely to have any choice over their diet. It also has implications for the applicability and generalisability of studies carried out with such a heterogeneous population (Prasher, 2003).

Another contention of categorising this heterogeneous group is the arguably spurious cut-off points for each subdivision and the ways in which these are measured. Researchers have contested the use of IQ (Siegel, 1989) to assess learning disabilities. Furthermore, they have contested the use of IQ cut-off points to assess level of learning disability due to the Flynn Effect (Flynn, 1999), i.e. a change in IQ scores over time, which may lead to inaccurate classifications (Truscott, 2005). As Prasher (2003) notes, there are few standardised assessment tools which have good reliability and validity or have been widely accepted. These difficulties notwithstanding, the term 'learning disability' and the subdivisions that exist are currently widely accepted. The present study will therefore employ these definitions.

1.2.2 Prevalence

Given the difficulties with accurately diagnosing learning disabilities, outlined above, and the suggestion that many people who have a mild learning disability are not known to services (Roeleveld N., 1997), it is likely that prevalence rates are underestimated. In an international critical review of 43 prevalence studies,

Roeleveld *et al.*, (1997) estimated prevalence of learning disability at 3.8 per cent. The largest proportion of this, 3.4 per cent, had a mild learning disability, whilst 0.4 per cent were classified as having a moderate, severe or profound learning disability. This is the most recent study to analyse prevalence in this way. Prevalence of people with a learning disability in the UK is reported as being around 2 per cent of the general population (Department of Health, 2001). However, this figure is taken from research carried out to establish prevalence of people with a learning disability in England (Emerson, 2005). It is estimated that in Scotland around 2.4 per cent of the population have a learning disability (2 per cent with a mild learning disability and 0.4 per cent with a severe or profound learning disability) (The Scottish Executive, 2000). There has been growth in the population of people with a learning disability, with one study carried out in England reporting a 53 per cent increase between 1960 and 1995 (McGrother, 2001) and a predicted 11 per cent increase expected between 1998 and 2008 (McGrother *et al.*, 2002). This increase has been attributed to a combination of factors such as improved neonatal health care, socioeconomic conditions and longer life expectancy (McGrother *et al.*, 2001).

In summary, the term ‘learning disability’ is applied to a heterogeneous population who have a wide range of abilities and support needs. The criteria for learning disability have been criticised on a number of grounds, however, there is worldwide acceptance of the three broad criteria. Prevalence rates vary, but there is evidence that there is a rise in the number of people with a learning disability in the UK. Having a learning disability means that the individual has certain cognitive and adaptive limitations that can make decision-making about some areas of his or her life challenging, if not impossible. The following section will examine this in more detail in relation to capacity, informed choice and duty of care.

1.2.3 Learning disability, Capacity, Informed Choice and Duty of Care

Capacity is defined formally in Scotland by The Adults with Incapacity Act (The Scottish Government, 2000). This states that people must be presumed to have consent as a starting point to assessment. It specifies that a vulnerable person, such as

an individual with a learning disability, would be deemed not to have capacity to make important decisions about their life if they displayed the inability to: act; make decisions; communicate decisions; understand decisions; or retain the memory of decisions.

Adults are generally accepted as having the capacity to make decisions about their lives, however a person with a learning disability may not have such capacity in relation to some or many areas of their lives or may require support to do so (BPS, 2006). It cannot be assumed, however, that having a learning disability prohibits the person from making a valid informed choice and some people with a learning disability will have the capacity to make important decisions independently. With the right kind of support people with profound learning disabilities are still capable of making choice in many circumstances, despite communication difficulties (Murphy & Cameron, 2008). It is, therefore, important to assess capacity on an individual basis and according to a person's ability, not their categorisation. The Mental Capacity Act (Department of Health, 2005), and The Adults with Incapacity Act (The Scottish Government, 2000) were designed to promote autonomy in addition to protecting vulnerable individuals; a positive move away from the overly paternalistic attitude taken towards this group in the fairly recent past.

Assessing capacity can, however, be complex. Assessment strategies have included using structured interviews or vignettes, graded in difficulty, which present general or relevant problems to the client (Arscott *et al.*, 1999; Suto *et al.*, 2005). Cognitive and neuropsychological assessments are also common approaches to assess capacity (BPS, 2006). General guidance on assessing decision-making capacity in people with a learning disability has only recently become available (The Scottish Government, 2008). This guidance recommends consideration of whether the person with a learning disability can: understand and retain the salient matter alongside the risks, benefits and alternatives, reason with information in order to come to a decision, communicate a choice and consent freely. (The Scottish Government, 2008) Such guidance is a welcome step towards increasing informed decision making of people with a learning disability. Given the complexity involved, psychologists have often

been employed to undertake this assessment of clients, where an important decision has to be made. These decisions are typically about contentious issues such as whether a client has the capacity to engage in a sexual relationship (e.g. Murphy & O'Callaghan, 2004) or to consent to particular medical treatments (e.g. Arscott *et al.*, 1999). More apparently mundane, day to day decisions, such as diet, receive comparatively less attention and the impact of these decisions on the client are often not considered in the same detailed way, despite the detrimental effect that having a poor diet can have on the client. This suggests that there is a need to focus more on the role and process of decision making in daily living.

1.2.4 Informed choice and duty of care

The recognition of the importance of client choice was strongly influenced by early philosophical movements, in particular the principle of normalization (Wolfensberger, 1972) and the Five Accomplishments (Tyne, 1981). The latter explicitly identifies the promotion of client choice as an indicator of good quality service provision. Services for people with a learning disability are increasingly adopting the criteria of promotion of client choice as a means of evaluating service quality (Murray, 1998). Promoting choice has also been identified as a key task for carers of people with a learning disability (Jackson & Jackson, 1998).

The promotion of choice must, however, also be balanced by the duty of care that carers have towards clients who lack the capacity to make an informed choice about certain areas of their lives. This principle is also embodied in the legislation (The Scottish Government, 2000) i.e. having a duty of care to make decisions in the best interests of those who are lack the capacity to do so themselves. Duty of care is defined broadly as the requirement of others to take reasonable steps to protect the welfare of an individual(s) when that person puts him/herself or others at risk (McKay, 1991). Duty of care can override the personal preferences of individuals if their choice is not an informed one or if they lack the capacity to make a valid choice.

Research suggests that some carers of people with a learning disability can have difficulty balancing the concepts of choice and duty of care. This problem has been found in relation to a wide range of behaviours such as dangerous, illegal and anti-social behaviour (McCarthy, 1997; Lyall, 1995; Hastings, 1995) as well as in relation to food choice and diet (McKenzie *et al.*, 2001; McKenzie *et al.*, 1999). In the latter studies, McKenzie *et al.* presented health care staff and social care staff members with vignettes presenting challenging situations involving a conflict between duty of care and client wishes. One example was a client who ate unhealthily and was overweight but who had no wish to diet. They found carers to be less confident with regards to how they thought they would manage the situation and to recognize both duty of care and client wishes as concerns. The authors themselves noted that using vignettes may not have elicited a true reflection of what staff would actually have done in practice. They suggested observing staff in real life situations may be a way to improve upon this type of research. Despite this, and despite small numbers, these studies highlight the confusion care staff have over how to balance facilitating client choice with duty of care.

Smyth and Bell (2006) noted that, whilst in recent years, carers, and even academics in the field, have undertaken the worthy goal of encouraging choice for people with a learning disability, it may be that in doing so health consequences are at times overlooked. They discussed previous research which regarded unhealthy food choice as acceptable (Bannerman *et al.*, 1990), and which inadvertently encouraged unhealthy eating, by, for example, encouraging clients to cook microwave meals (Bechtel & Schreck, 2003; Cooper & Browder, 1998). A key conclusion was that duty of care for a person with a learning disability must not be overridden in a misguided attempt to allow autonomy in circumstances where this is unsuitable for the person. They also commented that carers' attitudes and beliefs are likely to affect choice making for the person receiving care.

One recent small qualitative study illustrated that the people with learning disabilities, carers and care staff involved in the study held positive views about autonomy and personal choice with regards to the health of the person with a

learning disability (Young, 2007). The study involved 20 people with learning disabilities, 10 carers and 10 care staff and was carried out in North East Scotland. Whilst all participants held positive opinions of autonomy, care-workers seemed to hold a variety of views about this. One commented that people with a learning disability were entitled to their autonomy, as '(i)t is alright for other people to still smoke 40 a day and all that sort of stuff, or alcoholics and all that sort of things.' Another care worker felt it was important to steer their client in the right direction, to 'help him to make informed choices that are going to improve his lifestyle, although he, at first, doesn't recognise that.' The study found that participants struggled with the dilemma of personal choice versus risk reduction. One carer felt that care staff were too keen on promoting autonomy at the cost of the health of people with a learning disability. They said, '(t)he people who are organising his care feel that they shouldn't be imposing too much. But obviously that hasn't worked out because he shouldn't have got into this routine.' Whilst this is not generalisable, the study gives some useful insight into the views held by the individuals involved, which does seem to give some insight into the particular issues faced by carers on the subject of choice. This could be taken to provide further evidence for the issue of the discrepancies between different people's opinions over what constitutes promoting choice and autonomy and as to what might actually be a duty of care issue.

In summary, people with a learning disability by definition have difficulties with their cognitive and adaptive skills, which mean that they may not have the capacity to make an informed choice about some or all areas of their lives. The assessment of capacity is complex and, in many cases where what is deemed a serious issue arises, formal capacity assessment is completed by a clinical psychologist. In cases where the client does not have capacity, those who support him/her have a duty of care to take steps to protect the welfare of the person and do what is in their best interests. This can be a difficult balance and research shows that carers and professionals do not always get the balance right, both in relation to behaviours that are commonly recognised as significant e.g. aggression and sexual abuse, but also in relation to day to day behaviours such as eating a healthy diet. The next section will examine the

area of diet in people with learning disabilities and in particular, how this impacts upon health.

1.2.5 The Health of People with a Learning Disability

Compared with the general population, people with a learning disability face many challenges. In particular, they have greater health needs (Wilson & Haire, 1990; Beange *et al.*, 1995), which in many cases are undetected or unmet (Wilson & Haire, 1990; Lennox & Kerr, 1997). In an epidemiological study of people with a learning disability, Prasher (2003) reported that people with a learning disability are more likely to experience physical and mental health problems, although he pointed out this data is often difficult to gather. Prasher specifies that physical mobility problems or behavioural issues can be barriers to physiological and psychological assessment. Physical problems commonly experienced include heart conditions, certain types of cancers, and osteoporosis (Michael, 2008). Epilepsy and Autistic Spectrum Disorder also have high prevalence in people with a learning disability, as do dementia, thyroid and sensory difficulties. In addition, certain syndromes that result in a learning disability have associated medical conditions, for example, almost 50 per cent of people with Down 's syndrome have congenital heart problems.

People with a learning disability often live in areas of social deprivation (Morgan *et al.*, 2000), which is linked to poorer health (Wilkinson, 1998; Acheson, 1998). They may also face the additional burdens of stigma from the wider community, which can have an impact on psychological and physical well-being (Abraham *et al.*, 2002). Overall, they are a disadvantaged population (The Scottish Executive, 2004) and although people with learning disabilities are living longer due to improved health care, age-specific mortality rates for people with a learning disability are still higher than in the general population (McGuigan *et al.*, 1995).

In summary, people with a learning disability have greater and more complex health needs than the general population, which are often undiagnosed and unmet. One key additional health issue for people with learning disabilities is diet, weight,

particularly obesity, and the impact this may have on health. This will be discussed in detail in the next section.

1.3 Diet and Weight in People with Learning Disabilities

Weight is influenced by a number of factors, however, it is clear that poor diet has a negative impact upon weight (Butland *et al.*, 2008). There has however been little research conducted into the diet or eating patterns of people with a learning disability, as compared with the general population. Instead, the focus has been predominantly on weight. This section will begin by examining what is meant by healthy or unhealthy diet before focussing on diet in the Scottish population and then in people with learning disabilities. It will go on to focus on weight, outlining the research examining underweight and obesity in people with a learning disability. The little research that exists in relation to the link between diet and obesity in people with a learning disability will then be summarized, keeping in mind the role of carers in facilitating a healthy or unhealthy diet in those they support.

1.3.1 Diet

Healthy/Unhealthy Diet: Definitions and Impact

Unhealthy diet can lead to a variety of ill health consequences in particular obesity (World Health Organisation, 2003). This, in turn, is a risk factor for many chronic conditions and health problems, including increased risk of coronary heart disease, ischemic stroke, type 2 diabetes, osteoarthritis and breast, colon, prostate, endometrium, kidney and gallbladder cancers.

In general people with a learning disability are overweight and obese for the same reasons as the general population; an excess consumption of calories compared with those used throughout a day (Rotatori *et al.*, 1981). Factors that lead to unhealthy lifestyle therefore, such as unhealthy diet, will add to the problem.

Healthy diet has been described as eating a balanced diet, ensuring the consumption of the correct amounts of different food groups; carbohydrates, fruit and vegetables, protein, dairy, fat and sugar (Food Standards Agency, 2008), (Appendix 1). More specifically defining healthy and unhealthy diet is, however, a difficult task, and as there is no universal definition, the area is challenging to study. Previous research has examined eating healthier food (Oygar & Rise, 1996) dieting (Bagozzi *et al.*, 2004), eating a low fat diet (Lloyd *et al.*, 1993), soft drink consumption (Kassem, 1983) or intention to eat particular types of food, e.g. cheese (Sparks *et al.*, 1995). Other studies have used guidelines for healthy eating based on a selection of foods from the four food groups; starchy, dairy, protein and fruit and vegetables (Chambers *et al.*, 2007). What seems to be agreed, however, is that the Scottish population does not, in general, eat healthily.

Diet in the General Population in Scotland

The Scottish Executive state that ‘Eating well is a long-term investment in good health’ and emphasise the importance of ‘a framework of healthy eating, which looks more to fruit and vegetables, cereals, fish and leaner meat, and less fat, sugar and salt’ (The Scottish Office, 2008). They also indicate that healthy eating is important for a sense of wellbeing and is important in the prevention of conditions including heart disease, diabetes, high blood pressure, stroke, cancer and asthma.

The Scottish population has been said to have the unhealthiest diet in Europe, and the highest associated health costs. The Scottish Diet has been said to constitute of a high fat and sugar content and a low fruit and vegetable content (The Scottish Office, 1996a).

Ironically, it has been argued that this image of the Scottish diet, as ‘a Scotch pie and chips, washed down by a sugary drink or a beer’ (The Scottish Office, 2008) may in fact be sabotaging the campaign to improve the nations’ diet (Fuller *et al.*, 2003). Indeed Fuller *et al.*, (2003) suggest that as the image of the unhealthy Scottish diet as ‘chips with everything’ prevails, many people may not think of themselves as unhealthy as they do not see themselves as fitting in with this image. They may however still have an unhealthy diet and not recognise this is the case due to the

current portrayal of the unhealthy Scottish diet. Fuller *et al.*, (2003) add that people may not know what a balanced diet would be, and so may not be able to monitor their intake accordingly.

Government strategies to reduce obesity in the general population have acknowledged the role of diet and have focused on improving diet and increasing levels of physical activity (Butland *et al.*, 2008). These interventions are outlined in a later section. The following section will examine the contribution of diet to obesity and overweight.

Diet in People with a Learning Disability

Although research in this area is limited, it suggests that people with a learning disability often have unhealthy diets. In one large study of 500 people with learning disabilities across a range of residential situations, 74-84 per cent did not eat the daily recommended intake of five fruit and vegetables per day (Robertson *et al.*, 2000). (McGuire *et al.*, 2007) found evidence to support this, reporting that people with a learning disability consumed lower levels of fruit and vegetables, carbohydrates, dairy and protein. Their study constituted of a questionnaire survey of 157 carers of people with learning disabilities who lived in residential care or with families in the West of Ireland. The study found sugar and fat intake of people with learning disabilities to be comparable with the general population, although this does not necessarily mean that this intake was healthy. McGuire *et al.* (2007) found that carers reported people with a learning disability frequently eat an unhealthy diet. In addition, in a study investigating the issue of bowel problems in people with learning disabilities, Dickson *et al.* (2002) postulated that in their sample, unhealthy diet could be a factor in causing the clients' difficulties, although this study had a small sample of only 44 clients.

1.3.2 Weight

Measuring weight

Current literature commonly uses Body Mass Index (BMI) as an estimated measure of healthy weight, taking account of height. BMI is calculated by dividing an individual's weight in kilograms by the square of their height in metres. A BMI lower than 20 is classified as underweight, 20-25 normal, 25-30 overweight and over 30 obese. Recent developments in measuring weight suggest that BMI is an inaccurate measure. It has recently been suggested that measuring waist circumference or waist/hip ratio is a more effective measure of cardiovascular health risk than can be determined from BMI. Although further investigation is required, there is some evidence to suggest these measures are comparable (Vazquez *et al.*, 2007). Measuring the weight of people with a learning disability may have some additional challenges due to the person's mobility or fear of the weighing apparatus (Wilkinson *et al.*, 2007).

Underweight

Being underweight and malnourished increases risk of infection and decreases an individual's capacity for working (World Health Organisation, 2002). The prevalence of people with a learning disability who are underweight has been estimated to range between 10-43 per cent (The Scottish Executive, 2004). This is much higher than in the general population where prevalence is estimated to be four per cent (Department of Health, 1998). Higher estimates of prevalence of being underweight in this population seem to correspond with lower proportions of people with mild learning disabilities within research samples, (e.g. (Bhaumik *et al.*, 2008). In one study where the sample consisted entirely of people with profound multiple learning disabilities, there was a very high prevalence of 68 per cent for those who were underweight (Beange, 1995). In people with a learning disability, being underweight has been found to be associated with more profound levels of disability and is often as a result of difficulties with swallowing and the existence of cerebral palsy (The Scottish Executive, 2004).

There is a dearth of literature looking at people with a learning disability who are underweight. Whilst recognising the importance of the issue of underweight, the focus of the remainder of this section will, therefore, be on the issue of obesity, which has received more attention in the literature and affects the largest proportion of people with a learning disability.

Obesity

Obesity is a growing epidemic for the global population (World Health Organisation, 2003). In 1981, a survey of adults found that six per cent of men and eight per cent of women were obese. Current estimates for obesity in the general population in Scotland are 22.4 per cent for men and 26 per cent for women (The Scottish Executive, 2003).

This has serious consequences for physical and mental health. Physical health consequences of obesity are increased risk of coronary heart disease, ischemic stroke, type two diabetes, osteoarthritis and breast, colon, prostate, endometrium, kidney and gallbladder cancers (World Health Organisation, 2002) Obesity and its associated health concerns also impacts negatively upon quality of life and the cost of medical care (World Health Organisation, 2002). In addition, there is evidence that obesity has an adverse effect on psychological health (e.g.Carr & Friedman, 2005; Associate Parliamentary Food and Health Forum, 2008).

Prevalence of Obesity in People with Learning Disabilities

As with the general population, prevalence of obesity has grown over the years in people with a learning disability, and it is more prevalent in women than in men (Janicki *et al.*, 2002; Simila & Niskanen, 1991; Cunningham *et al.*, 1990). Overall, prevalence of obesity remains higher than in the general population (Emerson, 2005; Bhaumik *et al.*, 2008; Rimmer *et al.*, 1993) A study in 1982 found that 15.9 per cent of men and 20.6 per cent of women were overweight, with 15.6 per cent of men and 25.1 per cent of women obese (Fox *et al.*, 1984). The current level of obesity in

people with learning disabilities in Scotland has been estimated as between 10 and 56 per cent (The Scottish Executive, 2004). Some studies have reported even higher levels of obesity in people with a learning disability; one study found that 28 per cent of males and 59 per cent of females were obese (Rimmer *et al.*, 1993) whilst another reported 73 per cent of females and 56 per cent of males as overweight or obese (Bell & Bhate, 1992). This range is large and the results have varied due to methodology used and the subset of the population examined. For example, Rimmer *et al.* (1993)'s study involved people with learning disabilities living in different residential settings in the United States and controlled for the severity of the learning disability. In a different study, Bhaumik *et al.* (2008) analysed data about people who were on the Leicester Learning Disabilities Register and participated in regular health checks with the assistance of their carer. Studies therefore vary widely with regards to the populations they focus upon, and even potentially the cultural mores they are subject to, depending on country of origin. A recent review of the literature in this area by (Melville *et al.*, 2007b) commented that figures for obesity are higher than in the general population but that it is very difficult to gain an accurate estimate of the actual numbers as studies have varied so much over the years. The current conditions, where people are predominantly cared for within the community, is very different from the care circumstances of just a few years ago, when people with a learning disability were often cared for within institutions. This can make it very difficult to compare prevalence studies. Additionally, as mentioned earlier, there may be many people within the general population who could be classified as having a learning disability but who have managed without the input of services.

Non-dietary Factors Contributing to Obesity and Overweight

Obesity in people with a learning disability has been linked to a variety of interrelated factors besides diet. These include genetic syndromes such as Prader-Willi, Cohen and Bardet-Biedl syndromes, and, in women, Down's syndrome. Medication use, level of disability, living arrangements, social factors, levels of physical activity and age and gender also play a role (Melville *et al.*, 2007a). In particular it was found that: women are at higher risk; that people with a learning disability are likely to develop obesity at a younger age than people in the general

population; that people with mild-moderate learning disabilities have a higher prevalence of obesity; that levels of physical activity are lower than in the general population and that this contributes to higher rates of obesity. The review also found that people who lived in more restrictive environments such as in institutions or in supported group homes, had a lower BMI than those who lived more autonomously or with their families (Melville *et al.*, 2007a). The findings reinforce the importance of understanding the environmental factors which impact on obesity for people with a learning disability and for policy makers and health care professionals to work together to address these.

1.3.3 The Contribution of Diet to Obesity and Overweight

Few studies have looked at the contribution of diet to obesity and overweight in people with a learning disability. In their recent review paper, (Melville *et al.*, 2007b) comment on the scant literature available and suggest that this may reflect the methodological challenges involved in studying this area. They summarise the findings of the four studies they found on the topic. In one study, no relationship was evident between nutritional intake and BMI in 332 adults living within institutions (Cunningham *et al.*, 1990). In another, calorie intake and eating behaviour in equal numbers of adults with and without a learning disability was compared and found not to differ (Fox & Rotatori, 1982). The third study found that 74-84 per cent of people with a learning disability did not eat the daily recommended intake of five fruit and vegetables per day (Robertson *et al.*, 2000). The last study reported that people with a learning disability who were obese had a greater nutritional knowledge than non obese people with a learning disability and from this extrapolate that other factors than knowledge therefore impact upon the development and maintenance of obesity (Golden & Hatcher, 1997).

Melville *et al.* (2007) comment that it would be important to gain more understanding of the impact of dietary habits on obesity, however, they do not expand upon this. They mention 'overfeeding of people with learning disabilities to

ameliorate the effects of boredom, social isolation and problem behaviours' (pp.227) however they do not give a reference for this or say where they found this information, thereby missing an opportunity to provide an evidence base for a potentially important factor in obesity in people with a learning disability.

In contrast to Melville *et al.* (2007a), and Smyth and Bell (2006), argue that the findings of Golden & Hatcher (1997) do not necessarily suggest that nutritional knowledge is an unhelpful factor. They emphasise that knowledge does not necessarily equate with understanding and that it is important that the difference between the two be recognised and taken into account. In addition, it may be that dietary knowledge in and of itself is not enough to incur change in behaviour (Fishbein, 1975) , therefore it would be unreasonable to conclude that the results of Golden & Hatcher's (1997) study that level of knowledge about diet does not play a role in obesity in people with a learning disability.

There are also limitations with some of the other studies reviewed by Melville *et al.*, (2007). For example, the study by Fox and Rotatori (1982) had a small number of participants (only 14 participants with a learning disability and 14 without) and the findings of the study are, therefore limited in terms of their generalisability. In the Robertson *et al.*, (2000) study, which found that only 8 per cent of the 500 people with a learning disability living in a variety of different residential settings had a balanced diet, the classification system used is open to criticism. For example, eating chips on more than four days a week was classified as unhealthy eating behaviour. This suggests that eating chips on four days a week, and potentially on more than one instance in a day would be considered a healthy eating behaviour. This suggests that the study conducted by Robertson *et al.*, (2000) study was fairly cautious in some of the categorisations and their findings could perhaps even be an underestimate of unhealthy eating behaviours.

Smyth and Bell (2006) examined some of the factors behind obesity in people with learning disabilities from a slightly different perspective. They focused on the increased degree of autonomy and encouragement of choice making in relation to

diet for these people, and the effects this had. They suggested a number of key individual factors which affect choice-making for people with a learning disability including: cognitive ability, lifestyle, socioeconomic status, past experience of choice, lack of knowledge, degree of dependency, physical ability, genetic & physiological factors and oral & dental health. In addition, a number of key carer/staff/management factors were identified as potentially contributing to obesity. These were: lifestyle, dietary knowledge/experience, beliefs, attitudes and opportunities, ability to teach, management support, duty of care and stigma. These factors were drawn from the evidence base although in some of these areas the evidence base was extremely small and therefore the authors drew on clinical experience. This paper was, however, merely discursive, rather than a report on suggested improvement to current situations. The key factors identified are suggestions and would need to be tested out in a model. Furthermore, although they suggested that carers required training and guidance about, for example, how to go about increasing understanding rather than merely knowledge, they did not elucidate on how this could potentially be achieved.

The scarcity of the research in this area and the methodological limitations means that it is difficult to generalise the results to the wider learning disability population. The methodological shortfalls include potential problems in data collection. For example, data collected from medical files may be incomplete, whilst gathering data from people with a learning disability may be difficult due to communication problems. Data gathered from carers may be biased or may be an incomplete account. Another shortfall of the existing studies undertaken in this area is that the new methods of predicting obesity related health problems, such as measuring waist girth, have not been taken into account.

The potential impact of carers on the diet of people with learning disabilities has been discussed in section 1.2 when discussing duty of care, hence will not be repeated in full here. Briefly, some key points will be reiterated. Firstly, research has indicated carers' own attitudes may affect the people for whom they provide care. Secondly, in an attempt to increase choice making and autonomy for people with a

learning disability, unhealthy diet may at times be encouraged. An example of this would be teaching a client how to microwave meals, for example. Thirdly, again in relation to promoting choice and autonomy, carers may not realise when informed choice is not being made, or when an issue has become a duty of care concern.

As this section illustrates, healthy eating has a role to play in weight and general health. As discussed in more detail in section 1.2, carers may play a key role in influencing the diet of people with a learning disability. Therefore any dietary interventions for people with learning disabilities must also consider carers. The following section will address the issue of promoting healthy eating behaviour in people with learning disabilities.

1.4 Promoting Healthy Eating

As discussed in an earlier section, unhealthy diet can have many negative health consequences, such as obesity which is a major risk for chronic disease and mortality, and underweight which can increase the risk of infection and also increase mortality (World Health Organisation, 2003). Furthermore, it has been suggested that an unhealthy diet is linked to psychological and behavioural disorders (Associate Parliamentary Food and Health Forum, 2008). The above is true for people with learning disabilities and people in the general population. A main focus of the literature on people with learning disabilities has been on obesity rather than underweight or general unhealthy diet. Obesity is a multi-factorial problem as has been discussed. However in their most simplistic form, strategies involve increasing physical activity and decreasing energy intake. As the focus of this study is the relatively under-researched dietary component of this equation, the focus of this section remains on dietary intervention and the promotion of healthy eating.

1.4.1 Promoting Healthy Diet in the General Population

The British government has begun to address the need for healthy communities (Department of Health, 1998) required to reduce health inequalities and improve the health of the general population (World Health Organisation, 1998). This recognises

the concept of mutuality, i.e. that responsibility for health, lies with all involved; policy makers, health professionals, carers and the individual. Designed to Care (Department of Health, 1997) and Choosing health: Making health choices easier (Department of Health, 2004) are taking this principle forward in England and Wales. In Scotland it is present in Better Health, Better Care: Action Plan (The Scottish Government, 2007) which has a focus on reducing childhood obesity, creating environmental change which will promote healthy eating, such as encouraging shops to provide healthy food and a healthy diet plan.

Healthy living Scotland (The Scottish Executive, 2003) built on the Scottish Diet Action Plan (The Scottish Office, 1996b) with the aim of increasing fruit and vegetable consumption and reducing saturated fat consumption. The paper outlined plans to increase supply and demand for healthy food and provide support, education and skill development to allow people to make healthy choices. The recent Eating for Health: Action Plan (The Scottish Office, 2008) suggests,

'adequate dietary education and counselling skills to enable health professional staff, including primary care teams, to place increased emphasis on giving dietary advice to patients, both opportunistically and routinely.' and that local authorities ensure 'those providing "meals on wheels" services, home helps, care assistants and others involved in food provision hold, and apply, an appropriate knowledge of diet and nutrition'. (pp.7-8)

Preventative strategies such as ensuring information about food is available, accurate food labelling, encouraging the consumption of healthy foods such as vegetables, at times through subsidisation and designing environments with health in mind, ensuring exercise is accessible, for example providing playing fields in schools (Wanless, 2004) have gradually been introduced. In addition, guidelines recommend cognitive behavioural therapy as the treatment of choice for tackling obesity (National Institute of Health, 1998) although resources for this remain limited. The individual's involvement and understanding is also crucial in increasing the

likelihood that they will adhere to recommendations about their health (Myers & Abraham, 2005). Targeted approaches for disadvantaged groups are necessary.

Margetts *et al.*, (1998), looked at factors influencing healthy eating patterns in England. Respondents who had not made a change in diet were more likely to come from the 'worse off' group in the sample, to smoke, and to hold negative attitudes about eating healthily, including that healthy eating information was inconsistent. They believed eating healthily to be just another fashion, expensive and did not care what they ate. Those who had changed to healthy diet believed healthy foods were enjoyable. Those who had healthier eating behaviours and less negative attitudes were better educated and generally of a higher socioeconomic status. This adds further evidence to the need for targeted approach to reach the high-risk groups with negative attitudes and behaviours.

1.4.2 Promoting Healthy Eating for People with Learning Disabilities

The approach taken for the general population may address some but not all the facets of this issue for certain demographics. Current policies may even widen the health inequalities which already exist for people with learning disabilities. Addressing these inequalities in dietary health will require a multi-factorial approach, as it is necessary to increase healthy eating behaviours, improve nutrition and reduce obesity (Emerson, 2005). Strategies on tackling obesity need to be tailored specifically to meet the needs of people with a learning disability, where the ultimate responsibility for health may in fact not lie with the individual, but rather with their carer.

The World Health Organisation has particular recommendations for tackling obesity in the population of those with a learning disability (World Health Organisation, 2000a). The recommendations pertinent to diet stipulate that public policies should promote the availability and accessibility of healthy foods, that there should be a clinical response, and that this should include staff training and the introduction of programmes that are effective in supporting weight loss in people with a learning

disability. The Department of Health recognises the need to make services better fit the needs of disadvantaged groups (Department of Health, 2003). Planned interventions include the production of a booklet supporting dietary choice for each household, introducing cookery courses for schoolchildren and assisting poor areas to enable the availability of affordable healthy food. One policy that may have a positive impact for people with a learning disability living in the community is the intention of changing the environment to make healthy foods more readily available. Training in nutrition and diet will also be provided for NHS staff and this should peruse into local authorities. Supermarkets and consumer bodies will also be involved (The Scottish Office, 2008). The World Health Organisation (World Health Organisation, 2000b), also recognise the importance of health professionals in both the dissemination of information on health issues to staff and in training them in the effective teaching of this to people with learning disabilities and their carers. Current policies do not mention care staff who work with people with a learning disability, or who are not employed by the local authority. It may be that, as a result, care staff and charitable and voluntary organisations that support a variety of people, including those with learning disabilities, slip through these gaps in policy provision.

This is a significant concern, given the influence that carers can have on the diets of people with a learning disability. Rimmer and Yamaki (2006) commented on the lack of information as to how best to address this issue in people with learning disabilities who live in community settings and for whom food selection may be influenced by carers. It has been suggested that carers should receive training in order to be able to best teach people with learning disabilities about health, and about how to determine what is in a person's best interests with regard to the problematic issue of risk versus autonomy (Flynn, 1999). Hamilton *et al.*, (2007) showed that carer involvement in tackling obesity problems in people with learning disability was useful and cited a study (Hogan & Evers, 1997) which indicated that people with a learning disability who lived in care homes showed an improvement even when an intervention was solely with carers. Hamilton (2007) highlighted the importance of carer motivation and indicated that carers had a high dropout rate in some studies. It seems important to consider possible reasons for this as it is evident this has an effect on health interventions for obesity in the people they care for.

Interventions could also be developed for people with learning disabilities themselves, such as teaching self-regulation skills including calorie counting, reading nutrition labels and expressing preferences (Bechtel & Schreck, 2003). Smyth & Bell (2006) point out that teaching such transferable skills would be helpful even if the persons' circumstances changed.

In summary, carers potentially play a key role in influencing the diet of people with a learning disability, however, few of the health promotion initiatives target this group, who may themselves have poor knowledge and attitudes in relation to healthy eating. Whilst the general population can make informed choices about their diet, this is more difficult for people with a learning disability and is often not perceived as a relevant issue. It is important that carers can aid them with this, ensuring that knowledge and understanding are both present in the decision making process. The quickest way to intervene with this population may be to address the issue of healthy eating with care staff. Staff's position as employees may make intervention easier than with family members who are carers. The next section will examine more ways in which people's dietary behaviour might be changed.

1.5 Changing Behaviour

As has been established, unhealthy diet can have negative health consequences. This is true for the general population and for people with learning disabilities. Earlier sections have outlined the particular importance of tackling this issue in people with learning disabilities, and that a potential way of doing so may be through their carers. As previously outlined, carers have a major impact on the lives of people with learning disabilities, and carers' own attitudes and behaviours may influence the people they care for. Therefore, in order to tackle unhealthy eating in people with learning disabilities it may be important to target carers and attempt to increase the likelihood that they will encourage clients to eat a healthy diet. To this end, theories of behavioural change may be useful. This section will address current literature

regarding such theories and their efficacies before going on to examine the TPB in more detail.

1.5.1 Theories of Behavioural Change Applied to Health

Models of Behavioural Change

Theoretical constructs of behavioural change are important tools in examining and altering health behaviours. Reviews of the application of such theoretical constructs to health behaviours in general and to dietary health behaviours specifically, have cited a broad range of varying models (Armitage & Conner, 2000; Baranowski *et al.*, 2003). Armitage and Conner (2000) classified existing theories into three categories. The first category, 'motivational models', encapsulated theories which examined the effect of intention on behaviour. This included the Health Belief Model (HBM) (Janz, 1984; Rosenstock, 1974), Protection Motivation Theory (PMT) (Rodgers, 1983), Social Cognitive Theory (SCT) (Bandura, 1986), Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) and Theory of Planned Behaviour (TPB) (Ajzen, 1985). These models all use differing factors and variables to predict intention and thus behaviour. A brief outline of each will follow.

HBM holds that there are six predictors of behaviour: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, health motivations and cues to action. In PMT, perceived vulnerability and perceived severity determine threat whilst response efficacy and self efficacy determine coping. Threat and coping then determine the positive health behaviour (adaptive coping) or the negative health behaviour (maladaptive coping). With SCT, self efficacy and outcome expectations pertaining to action and situation lead to behaviour. In TRA and TPB, intention determines behaviour. In TRA, intention is moderated by attitude and subjective norm. In TPB, the additional variable of perceived behavioural control is included in order to adjust for external barriers.

In studies comparing the above models, TPB has been found to be the best predictor of behaviour (Connor, 1994; Quine, 1998). However it has been postulated that this may be due to the constructs of TPB being more honed and defined than those of the other models (Sheehan, 1996). Armitage (2000) comments that there is a large degree of overlap in these 'motivational models' and suggests that research should commence into the possibility of a combined model, as suggested by (Fishbein, 1997).

A major criticism of TPB however has been advanced by Armitage (2000). Armitage argues that intention is not equivalent to behaviour and that therefore only a proportion of the behaviour is accounted for by these 'motivational models'. A second category of models of behavioural change is therefore suggested. This category, 'behavioural enaction' incorporates those theories which included an attempt to turn intention into action within the model. Models that fall within this category are Implementation Intention (Gollwitzer, 1993), where deciding upon an action increases intention, and Goal Theory (Bagozzi, 1992, 1993) where goal intentions ('trying') are determined by attitudes towards process, success and failure, subjective norms and goal efficacy. Implementation Intentions have been found to improve outcome when added to TPB. In a study of women about breast self examination half of the sample were asked if they intended to self examine in the next month. At follow up, 64 per cent of those in the implementation intention category (those who had been asked the question), compared with 16 per cent of those who had not been, reported that they had self examined (Orbell *et al.*, 1997).

In comparison with TRA and TPB, segments of Goal Theory were found to explain larger amounts of variance (Bagozzi & Kimmel, 1995). Armitage and Connor (2000) therefore argues that such 'behavioural enactment' models are preferable to 'motivational models'. Furthermore, Armitage & Conner (2000) argue that whilst behavioural enactment models may be the best current option, their third category, 'multi-stage' models, may prove to be the best models once they are more thoroughly researched and their many facets, for example the question over whether or not change must take place in sequence, are more understood. According to Armitage & Conner (2000), models of this type assist 'behavioural enaction' and

increase strategies for maintenance. One example of a model given this classification is the Transtheoretical model of change (Prochaska & Diclemente, 1992). This model postulates that people have different stages of change: precontemplation, contemplation, preparation, action, and maintenance, and that different influences may affect the different stages. For example, beliefs may affect the precontemplation stage however control may have more influence in the action phase.

Armitage & Conner's (2000) debunking of 'motivational models' in favour of 'behavioural enactment models' may be somewhat rash. Just as they argued that there was much overlay between the variables in the 'motivational models' it could perhaps be said that this overlap exists to a certain extent in the 'behavioural enactment' models. For example, it may be that the process of forming an implementation intention or goal intentions increases an individual's perceived behavioural control as the planning may aid the perception of feeling in control. So called 'Behavioural enactment' models may therefore merely be more honed versions of 'motivational models'.

Given that 'multi-stage' models are as yet in an early stage of their development (in that they are complex and require further research regarding their application), it would seem that TPB is the most helpful currently available model for examining change of health behaviours. A review of the literature by (Baranowski *et al.*, 2003) provides further evidence to support this. One of the key issues regarding TPB is the measurement of behaviour in addition to the measure of intention. This will be explored further below.

Behavioural Change

Past behaviour in and of itself has been found to correlate very highly with future behaviour, often much more highly than any theory of behavioural change (Ajzen & Fishbein, 2005). Ajzen and Fishbein (2005) have postulated that this may be because, as people attempt to change their behaviour they encounter setbacks and they often return to their original behaviour. This would suggest that research should be carried

out into identifying and overcoming those setbacks. It also suggests that continuing to investigate how to increase the predictive power of TPB is still an important task.

This difficulty in assessing actual behaviour is a criticism of TPB. In their well designed meta-analysis, Armitage and Conner (2001) found that in much of the research no measure of actual behaviour was taken. As the model predicts intention, and not behaviour, this makes the outcome uncertain and casts doubt on the model's helpfulness. Of 161 articles compared in a meta-analysis containing 185 empirical tests of TPB, only 44 contained prospective self-reported behaviour measures and 19 were independently rated or objective (e.g. taken from records). The study did not mention whether the remainder did not include a measure of actual behaviour or if they used past behaviour as a proxy. Using past behaviour as a proxy for actual behaviour has been criticised. Armitage & Conner (2000) suggested it was a confounding factor as past behaviour independently correlates highly with future behaviour. In optimal circumstances, longitudinal research where follow-up data could be collected would be the best way to record 'actual behaviour'. This is often not possible, however and despite the sub-optimal nature of using past behaviour as a proxy for actual behaviour, Ajzen (1991) supports this methodology. This has been used effectively in studies of TPB. (Daigle *et al.*, 2002; Hrubes *et al.*, 2001; Ajzen & Driver, 1992)

In summary, although motivational models have been criticised, they appear to be the best available models, with Theory of Planned Behaviour emerging as the most helpful of these. Proxy measures of behaviour are not ideal, however most studies have used them and although often overestimated, these do seem to reflect actual outcome behaviour as they tend to correlate with intention. The current study uses TPB therefore the next section will outline the theory in more detail.

1.6 Theory of Planned Behaviour (TPB)

1.6.1 Development of the Model of TPB

An earlier section has given a brief outline of this model and some of the relevant issues however a more detailed description follows. The Theory of Planned Behaviour (TPB) (Ajzen, 1985), was developed from the Theory of Reasoned Action (TRA) (Fishbein, 1975), which attempted to improve the correlation between attitude measures and the performance of volitional behaviours.

According to this earlier theory, an individual's behaviour is dependent upon two determinants: one personal (their own attitude about the behaviour), and one reflecting social influence (subjective norms, how they think others would perceive it). TRA postulated that individual differences may affect the weight given to these important determinants of the intention.

TRA held that beliefs about behaviours ('behavioural beliefs') determined an individual's attitude towards a behaviour. In TRA these behavioural beliefs are linked to an outcome or the cost of the behaviour. For example, a carer believes 'encouraging healthy eating' (the behaviour) 'increases health', 'decreases negative comments of others'. An individual's evaluation of perceived outcomes linked with the behaviour, and the strength of these associations, determines attitude towards the behaviour. Therefore when an individual believes favourable outcomes will result from a behaviour they will hold a positive attitude towards conducting the behaviour. Likewise, if they believe unfavourable outcomes will result from a behaviour they will hold a negative attitude towards performing the behaviour.

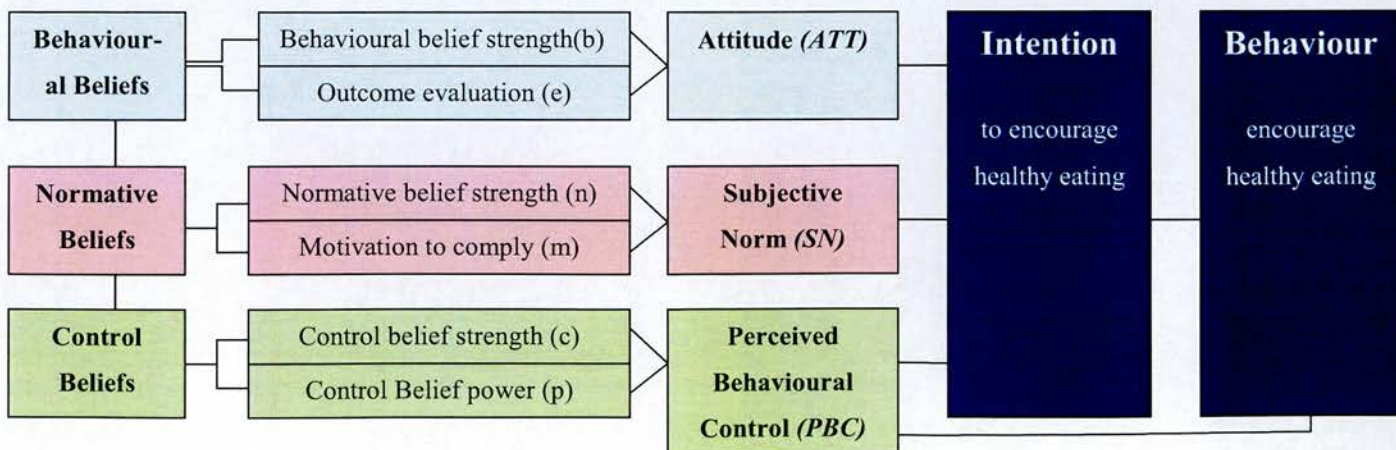
Subjective norms are the second component which inform the individual's beliefs in TRA. Subjective norms are the individual's perception of the beliefs of specific people or groups who are important to the individual. If the other person or group holds a negative opinion about a behaviour, the individual will be less likely to carry it out and conversely the opposite is true, that if the person or group are positive about the behaviour the individual will be more likely to carry it out.

In TRA therefore, these two components lead to the person's intention to perform a behaviour. TRA applies to volitional behaviours and contends that the stronger an individual's intention to engage in a behaviour, the more successful they will be. An individual may however not have control over all factors. For example, an intention to eat healthily could be impeded by being dependent upon someone else shopping and cooking.

The Theory of Planned Behaviour (TPB) (Ajzen, 1985) expanded the Theory of Reasoned Action in order to address this problem. It added the concept 'perceived behavioural control'. This refers to the individual's perceived ability or level of difficulty in performing the behaviour. The level of control an individual believes they have over a behaviour reflects their past experience and predicted obstacles, in other words, their 'control beliefs'. Some control beliefs may be seen as less readily altered than others. External control factors, such as opportunity and reliance on others, may be an example of these. If an individual believes they do not have the opportunities or resources they are unlikely to form the behavioural intention to carry out the behaviour, despite positive personal attitude and subjective norm to the behaviour. This is similar to Bandura's construct, 'self efficacy', which measures an individual's belief in their own ability to perform a behaviour (Bandura, 1986).

In summary, TPB suggests that three factors affect intentions; attitude towards behaviour, subjective norm and perceived behavioural control (Figure 1).

Figure 1: Theory of Planned Behaviour (Ajzen, 1985)



Further research has suggested it is possible to improve the predictive power of the TPB model with the addition of extra variables (Povey, 2000; Bebetos *et al.*, 2002; Armitage & Conner, 1999a) and this is an important next step for research (Baranowski *et al.*, 2003). The next section will examine current literature on this issue.

1.6.2 Summary of the Evidence regarding Predictive Variables of TPB

The variables of the original model of TPB that make up intention are: attitude, subjective norm and perceived behavioural control. Recent research has added a variety of other variables to the original model in an attempt to increase the predictive power of the model. From the existing literature it is difficult to gather a clear view of the best overall model of TPB.

Armitage & Conner's (2001) meta-analysis indicated that TPB accounted for 39% of the variance of intention to carry out a behaviour and 27% of the variance of the behaviour. A negative of this meta-analysis was that it did not differentiate between studies which had used the original model of TPB and those which had extended it with different variables. It is therefore difficult to compare the two. A more recent meta-analysis of studies carried out examining the application of TPB illustrated that, when the original variables were controlled for, an additional variable (descriptive norms) added to the predictive power of the model, accounting for a further 5% of the variance (Rivis & Sheeran, 2003). This study was smaller than the Armitage & Conner (2001) meta-analysis, however controlling for the original TPB variables and measuring the impact of one specific variable allows a clear picture to develop with regards to the benefit of adding the particular variable. It would be useful if similar studies were carried out with other additional variables. Rivas and Sheeran's (2003) meta-analysis supports the general findings that where additional variables are added they positively augment the model, increasing the overall predictive power (Rapaport & Orbell, 2000; Chambers *et al.*, 2007; Moan *et al.*, 2005)

Many studies of the original model of the TPB have found attitude to be the most predictive of the variables (Povey, 2000; Ajzen, 1991; Armitage & Conner, 1999a; Oygard & Rise, 1996). Studies with additional variables have commonly found attitude to be most predictive, often alongside other variables (e.g. Berg *et al.*, 2000; Moan *et al.*, 2005; Arvola *et al.*, 2008) although Chambers *et al.*, (2007) found self efficacy to be the most predictive variable.

Subjective norm has been found to be the weakest predictor in TRA and TPB studies (Shepperd, 1988). As a result, it has been suggested that subjective norm is an unhelpful variable and some studies have omitted it from their analyses (Sparks *et al.*, 1995). However, it has been suggested that this has been a methodological issue with measurement as a moderator of subjective norm's correlation with intention, as in the majority of studies subjective norm has been measured using a single measure (Armitage & Conner, 2001). Armitage & Conner's (2001) meta-analysis found that where multiple measures were employed, subjective norm was responsible for a higher proportion of the variance than where a single measure was utilised.

Studies have found that the inclusion of the perceived behavioural control variable, thus creating the TPB model, improves the predictive power of the model (Armitage & Conner, 2001). One criticism of the literature on perceived behavioural control is that this variable is often measured by mixed constructs, making it difficult to get a true picture of this variable. For example Armitage & Conner (2001) found that studies measured perceived behavioural control under three headings; perceived behavioural control, self efficacy and perceived control. They found that of these constructs, perceived behavioural control and self efficacy were useful variables, with both accounting for approximately the same amount of variance in behaviour, and self efficacy accounting for more of the variance with regards to intention.

It has been postulated that self efficacy should therefore be considered a variable in its own right. Ajzen suggests that self efficacy and perceived behavioural control are interchangeable, however it has been argued that the two variables in fact measure different facets of a similar construct, and self efficacy has been found to add predictive power to TPB independently of perceived behavioural control (Armitage & Conner, 2001). It has been postulated that the differences in findings regarding

perceived behavioural control and self efficacy may exist as self efficacy has a clearer definition and is more readily measure than perceived behavioural control (Bandura, 1986).

Another additional variable which has been suggested to add to the predictive power of the TPB model is that of self identity (Armitage & Conner, 1999a) although similarly there remains debate about this. It has been suggested that this measures personal norm, i.e. the individuals' own perception of the behaviour; and that this is perhaps another facet of subjective norm.

TPB has been found to correlate with actual behaviour. Armitage & Conner's (2001) meta-analysis found that 31 per cent of the variance of TPB could be accounted for when behaviour was self reported, with this figure decreasing to 20 per cent when behaviour was objectively recorded. Ajzen (2005) suggests that as past behaviour is a good predictor of future behaviour,

'a measure of past behaviour can be used to test the sufficiency of any model designed to predict future behaviour.' (p.202)

Studies which have used past behaviour as a measure of actual behaviour have found that it correlated highly with future intention and this has been used as evidence for the efficacy of TPB (Ajzen, 1991; Ajzen & Fishbein, 2005).

1.6.3 Summary of the Evidence Base for Theory of Planned Behaviour (TPB)

Chambers *et al.* (2007) provide a thorough account of the literature in this area. They comment that there is a large literature base in support of the Theory of Planned Behaviour (TPB), looking at a variety of health-related behaviours (Ajzen, 1991; Godin & Kok, 1996; Hausenblas *et al.*, 1997). Weight loss has been found to be predicted by the components of the model, particularly perceived behavioural control. TPB has also been found to have high predictive ability with regards to other

health behaviours, examining intention to use cannabis (Connor, 1994) and binge drink in young people (Norman *et al.*, 1998).

There has been debate over whether TPB can be used to examine health related food choice. There is no comprehensive review of this literature. It has been suggested that TRA and TPB have low predictive ability when examining eating behaviour. (Godin & Kok, 1996) however the meta-analysis which provided this data has been criticised for analysing their sample on more than one occasion, potentially affecting the validity of their study. It has also been postulated that food choice is often a result of habit (Aarts *et al.*, 1998), however the same could be said about other health behaviours, for example smoking, which denies the complexity of the issue. Conversely, some studies have found TPB to be predictive of health-related eating (Armitage & Conner, 1999b; Paisley, 1998). These studies have tended to find that attitude was the most predictive variable.

Healthy eating has been defined in various ways in the studies examining this topic. These have included eating fast food (Axelson *et al.*, 1983), eating healthier food (Oygaard & Rise, 1996), dieting (Bagozzi & Kimmel, 1995), and eating a low fat diet (Lloyd *et al.*, 1993). Soft drink consumption (Kassem, 1983), or intention to eat particular types of food, e.g. cheese (Sparks *et al.*, 1995) have also been used as a way of measuring healthy diet. Theory of planned behaviour requires behaviour to be time specific (Fishbein & Ajzen, 1975) and as such, studies have measured this in days (e.g. Kassem, 1983), weeks (e.g. Bagozzi *et al.*, 2004), months and 'within the next year' (e.g. Chambers *et al.*, 2007).

1.6.4 Theory of Planned Behaviour (TPB) in Different Populations

The Theory of Planned Behaviour (TPB) has been evaluated in a variety of populations. Cox *et al* (1998) and Paisley *et al.*, (1995) used samples which were considered representative of the UK population and studies have been carried out on

intentions of specific groups, such as children (Berg *et al.*, 2000), adolescents (Williams & Hine, 2002), and hospital workers (Armitage & Conner, 1999b).

TPB has been found to be predictive of parental intention to perform behaviours such as in the use of oral rehydration therapy for children with diarrhoea. This study found that attitude towards the behaviour and perceived behavioural control were predictive of intention (Hounsa *et al.*, 1993). In another study, TPB was found to be predictive with regard to parents limiting sugar consumption of children (Astrom & Kiwanuka, 2006). This study measured actual behaviour using diaries. Chambers *et al.* (2007) found the TPB was predictive of parental intention to provide a healthy diet for their children over the next year. The aspects found to be predictive were the core components of TPB with the addition of two extra factors: self efficacy and self identity.

Chambers *et al.*, (2007) decided to look at the intention of adults in the UK to eat healthily and in parents in the UK to ensure their children eat healthily. They used the Food Standards Association Guidelines to define 'healthy eating'. These stipulated particular amounts of certain items of food, the authors therefore changed this to portion size in order to make it easier for their participants. Chambers *et al.*, (2007) first conducted focus groups in order to gather information about the factors which influenced people's food choice. From this, a questionnaire was constructed in order to measure intention. They found that the theory of planned behaviour was predictive of intention to eat healthily over the next year in a large sample of adults in the UK. They also found that TPB was predictive of parents' intentions to get their children to eat healthily over the next year. They found that the extended model of TPB, with the variables of self identity, that is how the individual identified themselves with regards to food, e.g. a healthy eater, and self efficacy, that is their belief in their ability to be able to get their children to eat healthily was most predictive of intention in both populations. Chambers *et al.*, (2007) commented that this should be carried out with different demographic populations in order to determine its efficacy. They did point out that their study did not look at actual outcome behaviour and that this would perhaps be another area of research to be developed.

Only these two studies (Astrom & Kiwanuka, 2006; Chambers *et al.*, 2007) use TPB to examine one group of people's behavioural intentions towards another. These studies examine the intentions of parents towards children's behaviour. Despite recommendations (Jones & Hastings, 2003), there are currently no studies that examine the use of TPB in populations with other caring relationships, such as care staff of people with a learning disability.

Obesity and poor diet is a problem in the general population and more so in people with learning disabilities. While many factors impact on obesity and overweight, diet is a key issue. By definition, having a learning disability means an individual may not always have the capacity to make an informed choice about healthy eating. However research suggests that carers may not always make good choices either for themselves or on behalf of the people they support in relation to diet. While government interventions have begun to target diet, they as yet do not account well for the issue in people with learning disabilities and for the role of their carers with regard to this. Previous research has investigated theoretical issues surrounding healthy eating and could potentially inform interventions to promote a healthy diet. The TPB has a strong evidence base, despite some limitations and criticisms and has been used in relation to a range of health related behaviours, including healthy eating. More importantly, it has recently been shown to predict parental intentions to encourage their children to eat healthily, suggesting TPB could have potential as a model for other proxy groups, such as carers of people with learning disabilities.

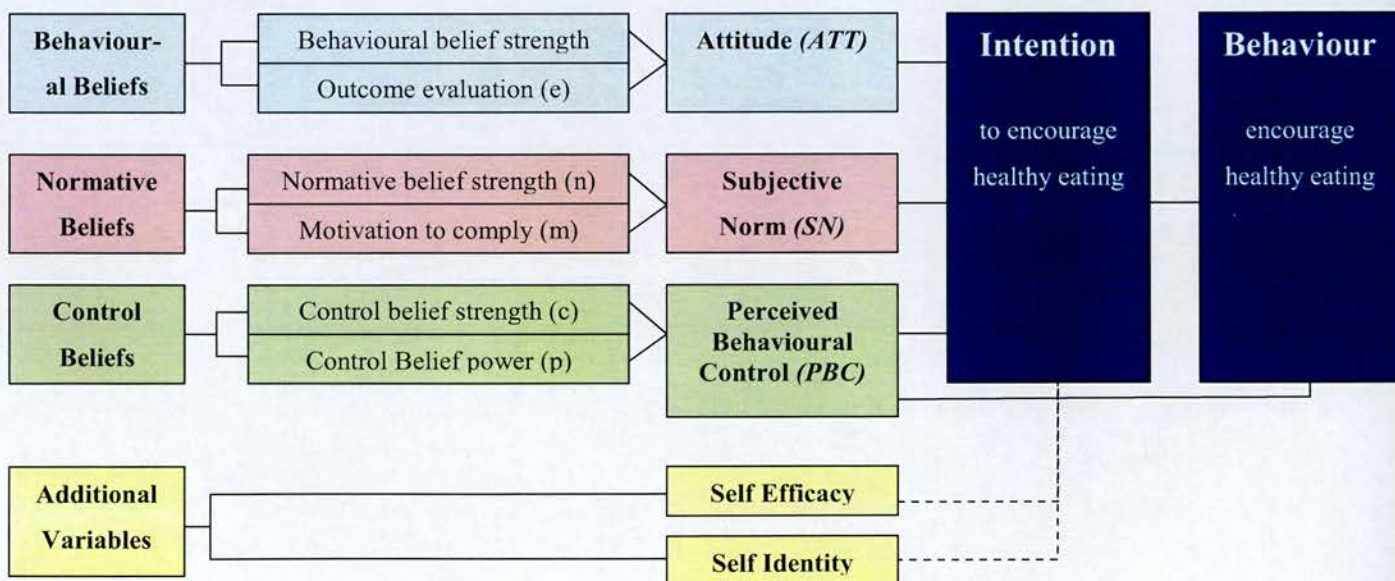
1.7 The Present Study

In order to better target healthy eating interventions for people with learning disabilities, the project will investigate whether TPB (with independent variables of attitudes, subjective norms and perceived behavioural control) can be applied to predict the intentions of care staff to encourage healthy eating behaviour (dependent variable) in this client group.

‘Actual’ behaviour will then be measured, using past behaviour as a proxy measure, in order to see if this correlates with intention. As past behaviour is a good predictor of future intention in its own right, and in fact has been found to be a better predictor than others, scores for past behaviour are likely to be more predictive than scores for intention as measured by TPB. However a correlation between past behaviour and intention as predicted by TPB may also offer evidence in support of the efficacy of TPB.

The project’s secondary aims are to describe the subjective norms, attitudes and perceived behavioural control in a population of professional carers and describe how they compare with other populations, that is, the general population and parents, in relation to healthy eating behaviour. Another secondary aim is to investigate whether the inclusion of the carer’s self-efficacy and self-identity improves the predictive value of the TPB model (Figure 2).

Figure 2: Extended Model of Theory of Planned Behaviour (with additional variables of self efficacy and self identity)



1.7.1 Hypotheses

Hypothesis 1: TPB will be a useful model in predicting intentions of carers of people with a learning disability to encourage healthy eating.

Hypothesis 2: The extended model of TPB (including the variables of self efficacy and self identity) will be more predictive of intentions of carers of people with a learning disability to encourage healthy eating than the original model.

Hypothesis 3: Attitude will be the most predictive variable of intentions of carers of people with a learning disability to encourage healthy eating

Hypothesis 4: There will be a correlation between carers reports of clients' healthy eating behaviour over the past year and carers intentions to encourage healthy eating.

2. METHOD

2.1 Ethics

The current study involves non NHS staff and did not require any participation from persons with a learning disability. As such, it did not require submission to an NHS ethics committee. The author emailed the thesis proposal form and an outline of the study to the NHS research authority who confirmed this was the case (Appendix 2). Before submission to University ethics panel, the researcher considered the ethics of the current study. It was felt that one ethical issue might be any questionnaire responses which gave rise to concern over care given to the person with learning disabilities. It was planned that feedback from the study would be disseminated in order that carers who participated gain understanding about potential unhelpful promotion of unhealthy lifestyles. The study will hopefully be able to inform future research which could then address this important issue. Another ethical concern was that asking for information about carers' attitudes to eating habits may seem daunting for them or perhaps even intrusive. It was countered that the reasoning behind the study would be clearly laid out in the participant information sheet and in verbal explanation of the study to the participants. The study was submitted to the University of Edinburgh ethics panel and permission was given for the project to proceed.

2.2 Design

The research was a quantitative, within-participant, questionnaire based design.

2.3 Power Calculation and Sample size

Cohen (1988) stated that as a rule of thumb, most effect sizes from psychological research are medium. Using guidance from Cohen (1992), most studies using the Theory of Planned Behaviour (TPB) can be said to generally have a medium to large effect size (Armitage & Conner, 2001). Therefore, the present study is expected to have a medium effect size. In calculating the sample required for a medium effect size a power calculation was carried out to determine how many participants were required (Cohen, 1992). Participant numbers required for a medium effect size, with a power level of 0.8 for a five factor regression analysis is ninety-seven.

2.4 Participants

Care staff from voluntary and charitable organisations in the South East of Scotland were recruited. The voluntary and charitable organisations were identified using a local telephone directory and through contacts of Clinical Psychologists working with clients with Learning Disabilities.

Inclusion criteria:

- 1) The participant must support people with a Learning Disability with independent living either on their own or in a group home.
- 2) The participant must be the main keyworker for a person with a Learning Disability who has a degree of choice over their diet. ¹

¹ The questionnaire requires staff to 'keep in mind' one client. In order to keep the data independent it was important that each staff member 'kept in mind' a different client. Sometimes clients have more than one keyworker and in this case the staff member who had the most contact with the individual was deemed to be the main keyworker. In instances where keyworkers spent equal time with the client the staff decided amongst themselves who would participate in the study.

Exclusion criteria:

- 1) The participant supports people with a Learning Disability who reside in a nursing home or hospital. (As within such residences the residents are less likely to have influence over meals and food available.)
- 2) The participant is the main keyworker for a client who has a diagnosis of Prader-Willi Syndrome or is tube-fed.²
- 3) Where there would be crossover between charitable/voluntary organisations already involved in the research study. This was to keep the data independent.
- 4) If the participant determined their own literacy levels would present a major barrier to them completing the questionnaire.

Eligible voluntary/charitable organisations who agreed to take part in the study:

In total, nineteen separate organisations were approached to take part in the study. Five of these participated.

2.5 Measurements

2.5.1 The Questionnaire

Original Questionnaire

Data was collected using an adapted version of a questionnaire devised by Chambers *et al.*, (2007) (Appendix 3). This original questionnaire was designed to examine what influences parental behaviour in giving their child a healthy diet. It included a section where the TPB was used. The original questionnaire was found to have good

² After consultation with a dietician it was determined that such individuals with learning disabilities would not have a sufficient degree of choice over dietary intake for the current study.

face validity and acceptable reliability as indicated by Cronbach Alpha scores of 0.96 for attitudes, 0.76 for subjective norms, 0.85 for perceived behaviour control, 0.84 for self identity and 0.83 for self efficacy. Scores above 0.7 are generally accepted as indicating good reliability (Field, 2005).

The questionnaire measured past healthy eating behaviour of clients, intention of carers to encourage a healthy diet in the next year, the original components of TPB i.e. attitude, subjective norm and perceived behavioural control and in addition the extra variables of self efficacy and self identity. Each factor was measured using a Likert scale from 1 – 7 where 7 represented the highest expected value and outcomes, with the exception of perceived behavioural control, where the scale was reversed and 1 represented the highest. Past behaviour, intention and self efficacy were measured using one question each. The other variables were more complex, as outlined below.

Attitude was measured with regard to 10 domains: weight control, energy, keeping in shape, aiding concentration, improving behaviour, long-term health prospects, food enjoyment, self esteem, likelihood of obesity and likelihood of anorexia. Respondents were asked to complete the Likert scale for both strength of behavioural belief and value of behavioural belief of each of these domains. The global variable was calculated by averaging the products of each specific domain's scores.

Subjective norm was measured with regard to four domains: Client's approval, client's family's approval, other staffs' approval, management's approval. For each domain both the belief of each significant other and the carer's motivation to comply with this was assessed. The product of each score was averaged to create a composite subjective norm score.

Perceived behavioural control was measured with regard to nine domains: time, cost, inconvenience, knowledge, disagreements, cooking, choice, client's spending and client's autonomy. For each domain the experience of barriers and the impact of barriers were assessed and the product of each score averaged to create a composite perceived behavioural control score.

Self identity was measured with regard to four domains, regarding self as: a healthy eater, enjoying eating, concerned with healthy eating, concerned about health consequences of eating. The product of each score was averaged to create a composite self identity score.

In order to avoid difference of opinion over what constitutes a healthy diet, the authors of the original research used healthy eating guidelines recommended by the Food Standards Agency (FSA) to provide a definition. A difficulty arose in that the FSA provided information on the number of portions which should be consumed. The authors of the original questionnaire therefore adapted this and referred to portion sizes, which was deemed a more tangible conceptualisation. These recommendations for healthy eating were presented at the beginning of the questionnaire with the expectation that participants would read it and use it to aid their understanding of healthy diet throughout the questionnaire.

Adapted Questionnaire

The author obtained permission from the original authors to adapt the questionnaire for use with carers of people with a Learning Disability. The author excerpted the section of the questionnaire which related to the TPB and made changes to some of the wording. These changes were such that the question was not changed in nature and most pertained to the substitution of the word 'child' by the word 'client'. Other changes included the substitution of language specifically used in reference to children such as 'at school'. In questions 6 and 10, examining subjective norm, the author considered outside influences relevant for carers of clients with a learning disability and changed this accordingly. This resulted in a change from 'friends' to 'other staff' and the inclusion of a question about management's opinion. Questions 11 to 16 were not part of the original study and were added by the author to collect demographic information.

Clients past behaviour was measured by question 1. With regards to the questions pertaining to TPB (Questions 2 to 10), intention was measured by question 2, attitude

was measured by questions 4 and 5, subjective norm was measured by questions 6 and 10 and perceived behavioural control was measured by questions 7 and 8. Of the additional variables of TPB, self efficacy was measured by question 3 and self identity was measured by question 9.

In constructing the information sheet, care was taken to ensure the language was simple and that the instructions would be understood. Readability literature recommends that documents aimed at the general public should have a maximum Flesch-Kincaid Grade level of 8, which is a reading age of 12 years. The information sheet was constructed with this in mind and has a Flesch-Kincaid Grade level of 7.2 and a Flesch reading ease of 66.5 per cent which is well within the suggested guidelines.

2.6 Procedure

2.6.1 Identifying Appropriate Care Organisations

- 1) The author's clinical supervisor is a Clinical Psychologist involved with care organisations. He informed contacts (appropriate managers of voluntary/charitable organisations) about the study. Their details were passed on if they expressed an interest and agreed it would be acceptable for the author to contact them.
- 2) The author contacted the local Clinical Psychology department who then discussed the research at their departmental meeting. From this discussion, particular contacts (again, appropriate managers of voluntary/charitable organisations) and care organisations were recommended to the author.
- 3) The author consulted the telephone directory to identify voluntary/charitable care organisations in the local area.

2.6.2 Contacting the care agencies

- 1) Where a contact person had been identified through prior involvement with a Clinical Psychologist the author telephoned the contact and after discussing the research project with them, asked if they would be interested in allowing their staff to participate.
- 2) Where no contact person had been identified, the author telephoned the agency's headquarters and asked for the contact details of the person who would be responsible for making a decision about staffs' involvement with research. The author then contacted this person, by telephone and by email if possible, to explain the project and ask if they would be interested in allowing staff to participate.

2.6.3 Explaining the project to the manager

The author provided the appropriate managers with the rationale for the study and informed them that she was currently undertaking a research project for her D.Clin. Psy. training. An outline of the procedure, including the inclusion/exclusion criteria, confidentiality and anonymity was given and questions were invited about the project. The researcher also expressed a commitment to disseminate the results of the study and indicated that she would be happy to feedback findings to the organisation when the research was complete. Once a manager had agreed their organisation would like to take part, the author discussed with them how it would best suit them for the author to deliver and later collect back the questionnaires. Where appropriate, she also asked if they were aware of any other teams within their organisation that might be interested in taking part in the research.

2.6.4 Piloting the Project

A pilot project was carried out with care staff from the first organisation who became involved. Staff members were asked to complete the questionnaire and to provide feedback about it on a separate sheet. From this pilot, no difficulties arose in completing the questionnaire. Each questionnaire was completed in full. Feedback highlighted that the information sheet made sense and that staff understood what was

being asked of them. One staff member commented that the questionnaire was aimed to a greater degree at ‘keeping in mind’ a person learning disabilities who was in twenty-four hour care than who was supported by an outreach service. The researcher felt that this comment may have been indicative of the perceived behavioural control factor and that as the questionnaire incorporated this element, no changes were required to the questionnaire, information sheet or staff briefing.

2.6.5 Rolling the project out

Where the suggestion was met positively, the author attended a staff meeting to explain the project to staff and leave materials. In other cases, managers preferred the author to drop off or post materials and for them to roll out the project. In such instances, the author discussed the project and staff briefing with the manager beforehand.

2.6.6 Distribution of Materials

The questionnaires (Appendix 4) were distributed with information sheets about the study (Appendix 5) and consent forms attached (Appendix 6). The information sheet outlined the purpose of the study and made clear that participation was entirely voluntary and anonymous. In addition there was a detachable sheet for contact details of individuals who wished to be informed on an individual level about the outcome of the study (Appendix 7). The researcher’s contact details were also given, in case of any questions or difficulties.

2.6.7 Collection of data

Questionnaires were to be completed anonymously and returned either by post, using pre-printed and paid envelopes provided by the author or deposited in a locally placed sealed collection box to be collected by the researcher at an appointed date.

2.6.8 Handling and coding of data

A database was constructed to hold the data from the questionnaires. The paper copies of the questionnaires were then kept on file in a locked filing cabinet in a locked cupboard.

On inputting data into the database, questionnaires which were incomplete or completed incorrectly emerged and a decision was made about how to code ambiguous answers. These are outlined below:

- 1) On occasion, participants had circled two numbers together. It was assumed that the participant was in two minds about which to choose and the decision was made to code this as the circled number which was closest to a neutral response, that is, the middle number on the scale. For example, if the participant had circled numbers 4 and 5 together, then the researcher took the answer as the number 4. The researcher deemed this to be the most cautious approach.
- 2) Some questionnaires had questions to which there was no response given. In these cases the researcher coded the answer as missing data in order that the statistical package would not attempt to analyse them automatically.
- 3) On some questionnaires the participant had written 'not applicable' as an answer to questions where this was not an acceptable answer. The researcher deemed that some of these indicated the carer actually meant that this was 'of little importance' to the person with learning disabilities and therefore the researcher coded this on the scale. An example is question 4 where participants were asked 'For my client, eating a healthy diet will: Help them feel good about themselves'. On other occasions where this had happened, the reason for it was unclear and therefore the question could not be scored. These were left blank. On all occasions where there was uncertainty over how to score an answer the researcher and two other researchers independently scored the item. If there was consensus, the mark was recorded, if not, it was not.

- 4) On 2 questionnaires, the demographic information section had been filled in incorrectly and the participant had selected that they cared for both genders and all age-ranges of people with a learning disability. In these instances, it was unclear as to whether the participant had misunderstood the task and had not kept an individual person in mind. As a caution therefore, these questionnaires were discounted.
- 5) Question 11 which asked if the client had ‘any special dietary requirements’ was coded quantitatively using content analysis. The researcher looked for patterns within the answers and found that they could be grouped into six different categories: none, weight gain, weight loss, ability to chew/swallow, diabetic and other. Two other researchers independently rated the answers and answers were scored according to the consensus.

2.6.9 Derivation of TPB variables from questionnaire data

Attitude was measured using an expectancy-value technique in 10 separate behavioural beliefs (Appendix 3, Q4 and 5)

$$ATT\alpha \sum be$$

Subjective norm was measured using an expectancy-value technique in 4 normative beliefs (Appendix 3, Q6 and 10).

$$SN\alpha \sum nm$$

Perceived behavioural control was measured using an expectancy-value technique in 9 control beliefs (Appendix 3, Q7 and 8)

$$PBC\alpha \sum cp$$

2.7 Analysis of Data

Variables (Table 1) were checked for normal distribution using histograms. Appropriate transformations were then carried out and normal distribution checked again with the use of histograms and tests of skew and kurtosis.

Table 1: Original Theory of Planned Behaviour variables plus additional variables of self efficacy and self identity

		Variable	Abbreviation
Outcome		Intention	I _B
Predictors	<i>Original TPB Variables</i>	Attitude	ATT
		Subjective Norm	SN
		Perceived Behavioural Control	PBC
	<i>Additional Variables</i>	Self Efficacy	SE
		Self Identity	SI

Univariate testing was carried out using the Pearson correlation to assess individual correlation of the transformed predictive variables with the outcome variable .

Multiple linear regression was then used to assess the performance of two separate models. These models were derived from previously published studies in the literature (Chambers *et al.*, 2007). The first model used the original three TPB predictive variables, and the second model included two further suggested predictors (Table 2). The “enter” methodology was used because this was not an exploratory analysis, but an analysis of the performance of previously derived models in a different population (Wright, 1997). The B coefficients, 95% confidence intervals, p-values and the adjusted R² were recorded for each model. In addition the overall ANOVA F statistic and p-value were recorded. Each model was checked to ensure that there was no confounding due to multicollinearity by examining the tolerances and variance inflation factors (VIF). Tolerances greater than 0.2 and VIFs less than 2 were accepted as evidence of no multicollinearity (Bowerman, 1990; Maynard, 1995).

Table 2: Mathematical representation of TPB (β values represent coefficients of each variable)

Original TPB	$I_B = \beta_0 + \beta_1 ATT + \beta_2 SN + \beta_3 PBC$
Modified TPB (Chambers <i>et al</i> , 2007)	$I_B = \beta_0 + \beta_1 ATT + \beta_2 SN + \beta_3 PBC + \beta_4 SE + \beta_5 SI$

With regards to missing values, when computing variables, if one value was missing the score was averaged using the remaining beliefs. If more than one value had been missed, no global variable was calculated. When undertaking modelling, in each model, 8 cases were excluded due to missing global variables.

Carer reported client past healthy eating behaviour, as measured on a Likert scale was used as a proxy measure for ‘actual’ behaviour. The original TPB literature (Ajzen, 1991) does not include actual behaviour in final predictive models. As past behaviour is well known to be a good predictor of future intention, Ajzen (1991) suggested using past behaviour as a proxy for actual behaviour, using correlations to determine a link between intention and behaviour. As intention and past behaviour were not normally distributed, they were assessed using non-parametric tests as literature suggests transforming the data is unnecessary when a Spearman test can be carried out (Altman, 1991). The Spearman test was used to determine the correlation between past behaviour and future intention.

2.8 Dissemination

The author intends to feedback the findings of the current research to the participating organisations in whichever way they deem appropriate. The author will also feedback the findings to the individuals who have completed contact forms requesting individual responses. It is hoped that the findings may also be submitted

for publication to an academic journal, in order to disseminate the findings on a larger scale.

2.9 Reliability and validity

The original questionnaire had good validity and internal reliability, as outlined above. In adapting the questionnaire minimal changes were made, and these changes did not affect the construct of the questions. The adapted questionnaire had good face validity and following analysis using Cronbach Alpha, it was found to have acceptable levels of reliability with scores of 0.93 for attitudes, 0.80 for subjective norms, 0.92 for perceived behaviour control and 0.88 for self identity. Self efficacy was calculated using a single measure therefore there was nothing to interrelate it with.



3. RESULTS

3.1 Introduction to Results

Firstly the demographics of the participants will be presented, followed by exploratory data analysis to identify if the data is normally distributed and conforms sufficiently to the underlying assumptions for parametric tests. The data will then be statistically analysed, using multiple regression analysis to address the research hypotheses.

3.2 Demographics

3.2.1 Gender and Age

Sixty-six (58.9%) of the carer respondents were female and forty-six (41.1%) were male. Fifty-nine (52.7%) clients were male and fifty-three (47.3%) were female.

The highest proportion of carers, thirty-seven in total (33.1%), were in the 35-44 year age range. There were no carers in the 65+ category. Clients were generally older with the highest proportion (again, 33.1%), falling within the 45-54 year age range. For a more detailed breakdown of ages see Appendix 8.

The fifty-nine male clients were supported by thirty-four men and twenty-five women. This meant that 42% of male clients were supported by a female carer. The fifty-three female clients were supported by twelve males and forty-one females. Therefore 77% of female clients were supported by female staff. There was a significantly higher proportion of females cared for by females than males. ($\chi^2=14.12$, $p < 0.001$).

3.2.2 Support Provided to Client

The number of hours during which individual staff supported the client each week ranged from two to forty hours, with a mean of 18.55 hours (s.d. 11.66). The number of hours of support provided by individual organisations to the client each week ranged from two to one-hundred-and-sixty-eight (full time) hours, with a mean of 93.44 (s.d. 63.38).

The percentage of support the client received from the carer ranged from 4.8% to 100% of the total care the client received, with a mean of 29.8% (s.d. 24.6). The majority of carers, 77 in total (69%), supported the client for up to 30% of the total care provided by the organisation, with only 12 carers (11%) providing between 60% and 100% of total care provided by the organisation.

3.2.3 Clients' Special Dietary Requirements

The majority of clients, 75 in total (67%), had no special dietary requirements. Difficulty chewing/swallowing food was the most frequent special dietary requirement, reported by 18 clients (16%). Eight clients (7%) were on diets designed to reduce their weight. Only 2 clients (2%) were on diets designed to gain weight. Three clients (3%) were diabetic. The remaining 6 clients (5%) had 'other' special dietary requirements, such as a vegetarian diet.

3.3 Theory of Planned Behaviour (TPB)

3.3.1 Theory of Planned Behaviour Variables

In order to prepare the data for the multiple regression analysis, they were initially checked for skew, kurtosis and homogeneity of variance. The variables measured in

the present study were: attitude, subjective norm, perceived behavioural control subjective norm, perceived behavioural control, self efficacy and self identity.

Table 3 below outlines the means and ranges for the TPB variables.

Table 3: Summary of TPB variable responses

Variable	Mean (SD)	Range	Proportion of positive responses(%)*
Intention	5.68 (1.19)	2-7	83%
Attitude	5.58 (1.12)	2-7	76%
Subjective Norm	5.45 (1.04)	3-7	70%
Perceived behavioural control	2.93 (1.35)	1-7	54%
Self Efficacy	5.50 (1.63)	1-7	78%
Self Identity	5.25 (1.33)	2-7	64%

* 1-3 on the likert scale for perceived behavioural control; 5 – 7 on the likert scale for others

Ninety-three carers (83%) had a positive future intention to encourage their client to eat a healthy diet, as indicated by a score of 5 – 7 (Table 1). The mean rating for future intention, 5.68 (s.d. 1.19), was higher than the mean rating for perceived behavioural control, 2.93 (s.d. 1.35). As can be seen in table 3, intention is the highest scoring variable, followed by attitude and then self efficacy.

3.3.2 Normality of Distribution

Initial histograms and normality testing (Appendix 9) indicated the data did not meet the requirements for parametric tests. The variables of intention, self efficacy and self identity were found to be negatively skewed and a second-power (squared)

transformation was used to correct this. Perceived behavioural control was found to be positively skewed and was corrected with a square root transformation. After transformation histograms indicated that the data were normally distributed with the exception of self-efficacy (Table 4 and Appendix 9). Therefore the conclusions drawn about self-efficacy should be interpreted with caution.

Table 4: Skewness and Kurtosis of the variables of TPB (Italic font signifies a normal distribution: mean within +/- 2 standard errors)

Variable	Untransformed		Transformed (Squared)	
	Skewness (SE)	Kurtosis (SE)	Skewness (SE)	Kurtosis (SE)
Intention	-0.984 (0.231)	<i>0.725 (0.459)</i>	<i>-0.437 (0.231)</i>	<i>-0.528 (0.459)</i>
Attitude	-0.890 (0.229)	<i>0.826 (0.455)</i>	<i>-0.345 (0.229)</i>	<i>-0.330 (0.455)</i>
Subjective Norm	-0.587 (0.231)	<i>-0.103 (0.459)</i>	<i>-0.147 (0.231)</i>	<i>-0.674 (0.459)</i>
Perceived Behavioural Control	0.808 (0.231)	<i>0.398 (0.459)</i>	<i>0.292 (0.231)</i>	<i>-0.396 (0.459)</i>
Self Efficacy	-1.188 (0.229)	<i>0.663 (0.455)</i>	<i>-0.724 (0.229)</i>	<i>0.455 (0.455)</i>
Self Identity	-0.630 (0.228)	<i>0.120 (0.453)</i>	<i>-0.015 (0.228)</i>	<i>-0.880 (0.453)</i>

As required by multiple regression, the assumption of linear correlation between the predictor variables and intention was checked. Pearson correlations were calculated (attitude, subjective norm and perceived behavioural control, and the added variables of self efficacy and self identity). All three theory of planned behaviour variables

and the added two variables significantly correlated with intention. Table 5 below summarises these results.

Table 5: Variables Correlation with Intention

Variable	Pearson r	P Value
Attitude	0.471	<0.001
Subjective Norm	0.461	<0.001
Perceived Behavioural Control	-0.219	0.024
Self Efficacy	0.464	<0.001
Self Identity	0.194	0.03

3.3.3 Multivariate Analysis

Two multivariate analyses were performed, the first one contained the TPB variables of attitude, subjective norm and perceived behavioural control. The second included all variables (as before, with the addition of self efficacy and self identity).

Model One

To address Hypothesis 1, that TPB would be applicable to this population, and Hypothesis 3, that attitude would be the most predictive variable, a multiple regression analysis was performed using SPSS version 13.0 on intention as outcome, on the basis of three predictors: Attitude, subjective norm and perceived behavioural control (model 1).

$$I_E = \beta_0 + \beta_1 ATT + \beta_2 SN + \beta_3 PBC$$

Data was collected from 112 participants and 104 questionnaires allowed calculation of all variables.

In this first model, subjective norm, attitude and perceived behavioural control were found to be significant predictors of intention, as Table 6 outlines.

Table 6: Multivariate analysis: Model 1

Variable	B (95% confidence interval)	β	P value
Constant	19.101 (7.243 – 30.958)		0.002
Attitude	0.335(0.110 – 0.559)	0.281	0.004
Subjective norm	0.395 (0.177 – 0.612)	0.340	<0.001
Perceived behavioural control	-5.208 (-10.390 – 0.026)	-0.164	0.049

The adjusted R^2 for this model was 0.313 (ANOVA $F_{5,98}=10.521$, $p<0.001$). Subjective norm had the highest standardised co-efficient ($\beta = 0.340$) showing it contributed most to overall intention and perceived behavioural control contributed least ($\beta = -0.164$).

The model was checked to ensure there was no multi-collinearity. All Variance Inflation Factors (Bowerman, 1990) (VIF) for each variable were less than 2 and there were no tolerances below 0.2 (Maynard, 1995)

Model Two

To address Hypothesis 2, that the inclusion of the additional variables self efficacy and self identity, would improve the predictive validity of the model, and Hypothesis 3, that attitude would be the most predictive model, a multiple regression analysis was performed using SPSS version 13.0 on intention as outcome, on the basis of five predictors: Attitude, subjective norm, perceived behavioural control, self efficacy and self identity (model 2).

$$I_B = \beta_0 + \beta_1 ATT + \beta_2 SN + \beta_3 PBC + \beta_4 SE + \beta_5 SI$$

Again, data was collected from 112 participants and 104 questionnaires allowed calculation of all variables.

Table 7: Multivariate analysis: Model 2

Variable	B (95% confidence interval)	β	P value
Constant	15.207(2.386 – 28.028)		0.021
Attitude	0.277 (0.040 – 0.513)	0.232	0.022
Subjective norm	0.328 (0.095 – 0.561)	0.282	0.006
Perceived behavioural control	-3.526 (-9.148 – 2.097)	-0.111	0.216
Self efficacy	0.131 (-0.43 – 0.306)	0.160	0.139
Self identity	0.026 (-0.137 – 0.189)	0.027	0.755

The adjusted R^2 for this model was 0.349 (ANOVA $F_{3,100} = 16.607$, $p < 0.001$). Subjective norm had the highest standardised co-efficient ($\beta = 0.282$). Attitude had the next highest co-efficient ($\beta = 0.232$). The remaining variables (self efficacy, self identity and perceived behavioural control) were not significant and the standardised co-efficients were lower (Table 7).

The model was checked to ensure there was no multi-collinearity. All Variance Inflation Factors (VIF) (Bowerman, 1990) (VIF) for each variable were less than 2 and there were no tolerances below 0.2 (Maynard, 1995). This suggests that these variables were not highly inter-correlated.

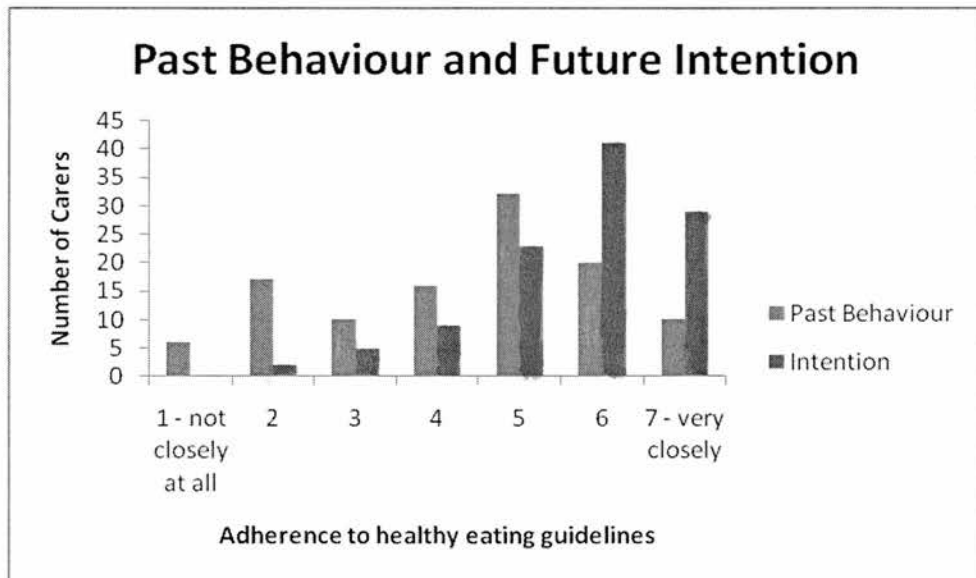
As the adjusted R^2 for this model was higher, it suggests this model is more predictive of intention than Model One however it reduces the influence of perceived behavioural control, self efficacy and self identity.

3.3.4 Past Behaviour and Future Intention

The main outcome measure in the study was intention to encourage clients to eat a healthy diet over the next year. As outlined in the method section, research indicates that intention can be used as a predictor of future behaviour, where there is a correlation between intention and past behaviour. In order to measure Hypothesis 4, that past behaviour correlates with intention, correlations were carried out. Past Behaviour was left untransformed as it was not going to be used in the regression equations. Therefore a non-parametric test was used to examine the correlation between behaviour and intention (Spearman).

The carers' mean intention to encourage clients to eat a healthy diet over the next year was 5.68 (s.d. 1.7). This future intention correlated with carer reported past healthy eating behaviour of clients_Spearman ρ 0.504 ($p < 0.001$).

Figure 3: Spread of responses regarding Past Behaviour and Future Intention



4. DISCUSSION

4.1 Overview

A number of research studies and policy documents have highlighted the issue of diet and its role in general well-being, underweight, obesity and associated health consequences. As levels of underweight and obesity are higher in people with learning disabilities than in the general population, research has recently begun to examine the issue for this group of people. There is growing realisation that policies which are designed to tackle dietary issues in the general population may well fail to address this matter for people with a learning disability, thereby widening pre-existing inequality. The issue of healthy diet in people with learning disabilities therefore requires further attention.

Many people with a learning disability rely on support from carers in a number of areas of their lives (Department of Health, 2001), including diet and food, suggesting that carers may play an important role in determining the diet of people with a learning disability (e.g. Rodgers, 1998). Various factors, including the carer's own beliefs and attitudes about diet (Jackson & Jackson, 1998; Rodgers, 1998; Benzeval *et al.*, 1995; Smyth & Bell, 2006) and the carers' attempts to balance duty of care with facilitating choice (e.g. Dickson *et al.*, 2002; Young, 2007) may impinge upon this.

The Theory of Planned Behaviour (TPB), which looks at the moderating effect of factors such as attitude, subjective norm and perceived behavioural control, has been shown to be a useful tool in studying intention to change health behaviours and actual behaviours. (Armitage & Conner, 2001; Ajzen & Fishbein, 2005; Daigle *et al.*, 2002; Hrubes *et al.*, 2001) It has been successfully applied to the study of dietary behaviours (Paisley, 1998; Lloyd *et al.*, 1993; Oygard & Rise, 1996; Hewitt & Stephens, 2007). Recent research has begun to explore the use of the TPB to examine the intentions and behaviours of one group of people toward the health behaviour of another; namely, parental choice about their children's diet (Chambers *et al.*, 2007; Astrom & Kiwanuka, 2006).

The present study, examined the extent to which the TPB could similarly predict intention of care staff in relation to diet choice for the clients with a learning disability they supported and how this compared with their reported actual behaviour.

The discussion will begin with an overall summary of the results, before examining individual aspects of the results in more detail. The theoretical implications of the main findings will be discussed in the context of previous research on the TPB. This will be followed by a section which explores the clinical, ethical and research implications of the study. An examination will then be made of the methodological limitations of the study. Finally, areas for future research will be outlined.

4.2 Summary of Results

The purpose of this research was to determine if the Theory of Planned Behaviour was a useful predictor of the intentions of care staff in relation to encouraging a healthy diet in the people with learning disabilities they provided care for and how this compared with their reported actual behaviour in relation to this matter. A brief summary of the results follows.

Hypothesis 1

The results indicate that, in line with hypothesis 1, the TPB is indeed applicable to this population. All three variables which make up the original model of TPB: attitudes, subjective norm and perceived behavioural control, were found to be statistically significant predictors of carers' intentions to encourage healthy diet in their client, accounting for 31% of the variance (model 1).

Hypothesis 2

Hypothesis 2 was partially substantiated. When all five variables were in the model (model 2), the predictive power of the model was marginally higher than when just

the three original variables were included, accounting for 35% of the variance. However in this instance, only attitude and subjective norm were found to be significant predictors of carers' intention to encourage healthy eating in clients, whilst the variables of self efficacy, self identity and perceived behavioural control were not significant.

Hypothesis 3

Hypothesis 3, that attitude would be the most predictive variable of carers' intentions to encourage healthy eating, was not substantiated.

Hypothesis 4

Hypothesis 4 was that there would be a correlation between carers' reports of clients' healthy eating behaviour over the past year and carers intentions to encourage healthy eating. This was supported by the results which found a significant positive correlation between the two. This is consistent with previous research which shows that past behaviour predicts future behaviour.

4.3 Detailed Discussion of Results

4.3.1 Hypothesis 1: Original Theory of Planned Behaviour

The current study hypothesised that the Theory of Planned Behaviour would be predictive of carers' intentions to encourage clients' healthy diet. This was based on previous research that found that TPB was predictive of intention and behaviour with regards to healthy eating. In particular the present study follows on from recent research that found the same was true for the intentions and behaviours of one group (parents) towards another (e.g. children) (Astrom & Kiwanuka, 2006; Chambers *et al.*, 2007)

The present study adds evidence in support of the findings of these previous researchers. It found that the original model of TPB predicted carer intention to encourage a healthy diet in the clients they supported, with all three variables found

to be significant predictors of intentions. The present study found that this accounted for 31% of the variance, whilst in the Chambers et al (2008) study, they accounted for 42% of the variance. The effect size of the present study is therefore comparable with other studies which have found that TPB has a medium to large effect size (Armitage & Conner, 2001). Although smaller in effect size than Chambers *et al.*, (2008) and some other studies of TPB which have accounted for large proportions of the variance, the current study is in line with previous studies of TPB which have found a medium effect size. Possible reasons for this are discussed in a later section.

The findings of the present study are in keeping with the large number of studies which indicate the efficacy of the TPB (Armitage & Conner, 2001) and its ability to predict intention and behaviour for a range of health behaviours (Ajzen, 1991; Godin & Kok, 1996). The results add to and expand the literature base for the use of TPB to predict intention of healthy eating behaviours (Paisley, 1998; Armitage & Conner, 1999b; Povey, 2000).

4.3.2 Hypothesis 2: Extended Theory of Planned Behaviour

The additional variables of self efficacy and self identity were added to the model as previous research has indicated that they may improve the predictive power (Chambers *et al.*, 2007). Whilst there remains debate as to the precise nature of these variables, it is generally believed that self efficacy represents the individual's confidence in their own ability to carry out a behaviour (Bandura, 1986). Self identity pertains to an individual's beliefs about themselves in relation to a behaviour (Armitage & Conner, 1999a).

Hypothesis 2 was found to be partially substantiated. The additional variables did increase the overall predictive power of the model by 4%, however the additional variables reduced the predictive power of the variables, rendering all but two (attitude and subjective norm) non-significant. In light of this decrease in variable predictive power, the 4 per cent overall increased variance may have been merely as a result of the statistical test taking account of the extra variables. Thus, the inclusion

of the additional variables did not overall improve the predictive power of the original TPB.

The inclusion of the additional variables reduced the predictive power of the variable of perceived behavioural control which became non significant, as were self efficacy and self identity themselves. This contrasts with various studies (Chambers *et al.*, 2007; Armitage & Conner, 1999b; Bebetos *et al.*, 2002) that have found these additional variables to be significant predictors and improve the predictive power of the model. Such studies have often contained other variables however. For example, Chambers *et al.*, (2007), in a proxy population, found that the addition of self efficacy in conjunction with the widening out of the subjective norm variable into separate variables (child, partner and friends) improved the predictive power of the model to make it 64 per cent predictive from 42 per cent predictive. This methodological issue makes it unclear which proportion of the variance may be attributed to the additional inclusions (i.e. the widening of the subjective norm variable) and which to the power of the self efficacy variable.

Likewise, studies have found that the inclusion of the self identity variable increases the predictive power of the model (Armitage & Conner, 1999a). Chambers *et al.*, (2007) found that in an adult population considering their own healthy eating behaviour, self identity was an important predictor variable. Conversely, in the proxy population, with the parent considering their child, self identity was measured but not included in their reported summary of regression analyses, thus suggesting it was not found to be a helpful variable in this population. Therefore the present study supports the findings of Chambers *et al.*, (2007) regarding self identity's lack of impact upon the predictive power of the TPB.

As Chambers *et al.*, (2007) is the only previous research to examine the use of TPB with the additional variables in a proxy population, there is, at this time, not enough evidence to suggest whether these two variables are helpful or not within this type of population. Certainly, the current study used the same measures of self efficacy and self identity as Chambers *et al.*, (2007) yet yielded different results regarding self efficacy. The variables themselves bear further scrutiny with regards to their suitability for application to proxy populations and to the current study's population

(carers of people with learning disabilities). The current findings do, therefore, provide support for the postulation of Chambers *et al.*, (2007) that research into TPB should be carried out in different demographic groups in order to see which variables are most predictive for specific groups.

Two reasons seem likely to offer some explanation as to why the additional variables were found not to improve the helpfulness of the original TPB in the current study. The first is that these variables are not suitable for a proxy population, as discussed above. This may be particularly true for self identity as perhaps a proxy group, such as parents, or carers, are able to put aside their own reactions pertaining to the behaviour as they are aware they have responsibility for the others' welfare. Public health policy and national awareness of negative health consequences of behaviours may impact upon this. For example, it would have been interesting to see inclusion of self identity in the study carried out by Astrom (2006) into sugar consumption of children in Uganda. In this study, they found the prevailing culture advocated giving children sugary treats as rewards and gifts. The inclusion of self identity may in this study have identified a strong link between self identity and intentions to allow children sugary treats. One reason for this may have been parental lack of understanding of the potential harm to their children, thus parents would not put aside their own positive view of sugary foods.

With regards to self efficacy, it may be that this concept is inappropriate for a proxy population due to the construct of the variable. To clarify, it has been suggested within the literature that self efficacy is interchangeable with perceived behavioural control (Ajzen, 1991). Conversely it has been postulated that in self efficacy the locus of control is internal, whilst in perceived behavioural control the locus of control is external (Bandura, 1986, 1992). If the latter is correct, then perhaps self efficacy is not a viable variable to use in the TPB with proxy populations. Although one may feel a certain amount of internal control, perhaps internal control is not truly possible when the subject of the behaviour is not the person asked the question but is another individual. To recap, a possible explanation of the poor performance of the two additional variables is their unsuitability for use in proxy studies.

The second possible explanation as to why the predictor variables were found to be unhelpful when added to the TPB is that they may not be applicable to the specific population of the current studies, i.e. to carers of people with learning disabilities. Perhaps the self efficacy variable was not found to be predictive for the participants of this study as it may have merely assessed their perception of their capability to do what they saw as being their job; meeting the requirements of the organisation. This may reflect good training within their organisation or good support from management. Similarly, self identity perhaps had less of an impact for the paid carers who participated in this study, due to the overriding importance of the organisations' identity. It may be that the organisation has raised particular issues regarding clients' healthy eating and that the carers are aware it is their position to meet requirements set by their employer, regardless of their own perceptions about food and that they have a duty of care towards the client. Research has certainly indicated that support of staff through supervision and training can have a positive impact on the staff, and therefore on the care provided to the person with a learning disability (Hamilton *et al.*, 2007). It has also highlighted the importance of ensuring the values of the organisation are adhered to through training and therefore carried over in the carers' work with the client (Hatton et al 2002).

Interestingly, research has found that it is often the informal staff culture and norms passed from staff member to staff member that influences staff behaviour rather than the formal culture of the organisation (Emerson & Emerson, 1987). These findings are in relation to challenging behaviour which would perhaps have a more direct and personal impact upon care staff than client's dietary intake, perhaps explaining potential difference in influence. In the current study, the subjective norm variable was found to be the most predictive variable, both in the original model of TPB and in the extended version. This measure included the carers' perceptions of both management and other staffs' attitudes to clients' healthy eating, which may lend support to the view that both managements' perspectives (which are likely to correspond with the ethos of the organisation) and other carers' perspectives may play more of a role than the carers' own self identity.

Furthermore, as mentioned earlier, addition of the two extra variables decreased the power of the perceived behavioural control variable, rendering it no longer significant. One possible explanation for this effect is that in the original model, perceived behavioural control fell only marginally below the minimal level for a variable to be considered significant. Perhaps the addition of any extra variables would have decreased the power of this variable.

Overall, it may be concluded that the additional variables did not improve upon the predictive power generated by the original TPB variables.

4.3.3 Hypothesis 3: Attitude as prime predictor

Contrary to the hypothesis and to prior research (Povey, 2000; Ajzen, 1991; Armitage & Conner, 1999b; Oygard & Rise, 1996; Chambers *et al.*, 2007) attitude was not found to be the best predictive variable when the original model of TPB was applied. The current study used four measures of subjective norm, lending support to Armitage and Connor's (2001) supposition that reported poor performance of this variable may be due to poor measurement as previous studies often used only a single measure. Perceived behavioural control was significantly predictive but fell only marginally below the minimal level required for a factor to be considered significant. This is in line with other studies which have found that perceived behavioural control is a significantly predictive variable (Berg *et al.*, 2000; Hewitt & Stephens, 2007; Moan *et al.*, 2005; Armitage & Conner, 2001; Chambers *et al.*, 2007).

Hypothesis 3, that attitude would be the most predictive variable, was not supported in model 2 which included the additional variables of self efficacy and self identity in the TPB. Attitude and subjective norm were the only significantly predictive variables in this model. As outlined earlier, multiple measures of subjective norm increased its predictive power, and it may be that this is partly as it ensures important influences (e.g. managers and other staff as outlined above) are encapsulated in the variable.

The present study is the first and only piece of research, to the author's knowledge, which examines the applicability of the TPB in relation to people with a learning disability. It is one of only three studies (Chambers *et al.*, 2007; Astrom & Kiwanuka, 2006) which have examined the applicability of the TPB for one group (in the present study, people with a learning disability) based on the attitudes etc of another (in the present study, carers). This is an important area of research pertaining to people with a learning disability. Many people with learning disabilities rely on others for levels of support ranging from minimal to full-time (The British Psychological Society, 2006). Furthermore, people with learning disabilities are not always able to make an informed choice without help. Dealing with obesity and its associated health risks, in which diet plays a role, is an area of burgeoning need in this population (The Scottish Executive, 2004). These factors will be discussed in more detail in the clinical implications section.

4.3.4 Hypothesis 4: Correlation of past behaviour with future intention

One of the issues which arises when using the TPB is the difficulty in measuring actual behavioural outcome. Many studies have not even attempted to measure actual behaviour (Armitage & Conner, 2001) whilst others have measured past behaviour as a proxy for actual behaviour (Daigle *et al.*, 2002; Hrubes *et al.*, 2001). Past behaviour has been shown to be a good predictor of future outcome, therefore if past behaviour correlates with intention this is taken to be a sign that the TPB is efficacious and that past behaviour also measures actual behaviour (Ajzen, 1991).

In the current study, carers who reported that their client's past eating behaviour had been healthy were likely to have a high intention to encourage the client to eat healthily over the following year. As carers' past behaviour is likely to have influenced clients' past behaviour This is in line with what is known about past behaviour as a good predictor of future outcome (Ajzen & Fishbein, 2005). Several studies have used this methodology and have found a high correlation between past behaviour and intention (e.g. Daigle *et al.*, 2002). The correlation between past behaviour and intention in the current study was taken as a good indicator that intention as measured by TPB predicts actual behavioural outcome. As mentioned earlier, this study did not directly measure carers' past behaviour (intention to

encourage client's healthy eating), instead clients' past healthy eating behaviour was reported, which carers' past behaviour would have influenced.

It is likely that carers whose past behaviour encouraged healthy diet in clients therefore already had a positive attitude towards encouraging clients' healthy eating. In addition, it is likely they perceived others' to also have positive attitudes towards clients' healthy eating and to have a high degree of perceived behavioural control regarding encouraging clients' healthy diets.

Whilst reported behaviour is not the same as actual behaviour or future behaviour, many studies have used this methodology due to the difficulties of measuring behaviours. This will be discussed further in the later section on limitations of the study.

4.4 Clinical Implications

There is a current drive from government to improve health through tackling healthy eating (The Scottish Office, 1996b, 2008), however there is a lack of interventions for people with a learning disability . The present study found that the TPB highlighted some of the components which predicted carer intention to encourage healthy eating in clients with learning disabilities. This provides a basis from which to begin the construction of interventions.

The study indicates that increasing the positive attitude of those around carers (subjective norm) towards encouraging clients' healthy diet could be a crucial first step towards improving the likelihood that carers' will encourage clients' healthy eating. People around carers include management, other staff, clients and clients' families. In the present study, attitude was not more predictive than subjective norm. This contrasts with the findings of many previous studies (Povey, 2000; Ajzen, 1991; Armitage & Conner, 1999a; Oygard & Rise, 1996) including Chambers et al (2007) which found attitude to be the most predictive variable. From the current study, it appears that increasing carers' positive attitude towards encouraging healthy eating in clients may be another important step. Each of these steps may impact positively

on the other, e.g. positively influencing the attitudes of those around carers will lead to a more positive attitude in carers themselves.

In line with previous research (Hamilton *et al.*, 2007) staff training may be an important way in which to address this as it will shape the opinions of all staff, thus simultaneously directly targeting the attitudes of individual staff members and contributing to a positive cultural norm. With regards to increasing the positive attitudes of clients towards healthy eating, past strategies have included attempting to increase knowledge and awareness of healthy eating, and teaching self-regulation skills such as calorie counting and reading food labels (Bechtel & Schreck, 2003). Previous research has indicated the importance of carers' involvement in client interventions in order to maximise efficacy of interventions (Hamilton *et al.*, 2007). The current study indicates that interventions, such as these, which target clients, may also have a knock-on positive impact for carers' intentions to encourage clients' healthy diet as client wishes are important to carers. Thus, such interventions not only assist clients in making healthy choices but also encourage staff to do likewise.

As discussed in the introduction, teaching choice has at times actively encouraged unhealthy choice. More recently, people with learning disabilities have been directly targeted with regards to making healthy choices about diet. As part of Shape Up Europe, an international project to reduce obesity, Somerset County Council in conjunction with service users created a DVD examining choice of healthy and unhealthy foods for people with learning disabilities (Somerset County Council). The DVD comprises vignettes compiled from the true experiences of the service users, and uses a 'food wheel' and 'lunchboxes' to demonstrate healthy diet. Such a resource may prove useful in encouraging people with learning disabilities to eat healthily or to at least see the issue in a positive light. This should then have a positive impact on care staffs' intentions to encourage clients' healthy diet, although carers' attitudes should also be targeted directly in order that they can reinforce client based interventions. Similarly, recent resources from the Food Standards Association (Wales) include interactive computer-based learning which teach about healthy diet. The first of these allows the online construction of a balanced food plate (Food Standards Agency) similar to that the Food Standards Agency's recommended

'eat well' plate (Appendix 1). The second, instructs the user to recreate an online approximate of their usual breakfast (Food Standards Agency) and then provides them with information about how healthy or otherwise this would be.

Resources such as these, used within an educational training programme for carers and clients, and aimed appropriately for each audience, may help improve the current situation. This kind of approach might firstly increase the knowledge and understanding of carers and clients as to what is a healthy diet. Secondly, such an approach may help to reframe healthy diet more positively than many may see it. Increasing clients' knowledge and understanding of healthy eating is likely to in turn improve their ability to make informed choice about diet. This will hopefully aid the reduction of instances where staff unwittingly allow people with learning disabilities to make un-informed choices about their diet, with potential health costs (McKenzie *et al.*, 1999).

The current study found that the majority of carers, 93 in total (83%), had positive intentions to encourage a healthy diet for their clients. The high prevalence of obesity in people with learning disabilities, and the literature which indicates that carers have an impact on clients' lives and choices, seems to clash with the findings of the current study regarding carers' intentions. It is a possibility that this could be indicative of a biased sample, which will be discussed in more detail in the section on methodological limitations. Alternatively, the clinical implication is that carers encourage a healthy client diet, but that other factors impede this. One such factor may be the clients' level of autonomy and their ability to eat an unhealthy diet when away from carers. However, as it is known that obesity is a multi-factorial problem, another possibility is that other factors contributing to obesity, such as levels of physical activity, are either important in conjunction with or more so than dietary intervention alone.

4.5 Ethical implications

There were some ethical implications of the present study. A few participants, gave negative responses to some questions. These indicated areas where it would perhaps benefit staff and their clients if staff were given guidance. The author of the present study will contact each of the organisations that were involved in the present study and will arrange to disseminate the findings of the research to each group, in the form of a talk and a written summary that staff can take away with them. This will provide an opportunity to increase carers' knowledge about the issues surrounding healthy diet for people with a learning disability and challenge negative views or attitudes.

Staff may find themselves in an ethical quandary at times when trying to balance the wishes of clients with the views of management and clients' families, and with the clients' health needs. Recent guidelines advise staff how to ascertain whether a person with a learning disability is capable of making decisions about a particular situation (The Scottish Government, 2008). The guidelines state that it should always initially be assumed that the person involved is capable and that this assumption should then be assessed. These relatively new guidelines will help to inform staff about what the correct management of a situation should be if there is disagreement over care. This does raise the question about whether carers, as low paid, non-experts should be making such important decisions for a potentially vulnerable group. This is particularly true as obesity is so widespread in the general population, suggesting people in the general population (such as carers) do not necessarily know what constitutes a healthy diet. This raises the ethical issue that staff may inadvertently encourage clients to eat an unhealthy diet, due to their own lack of knowledge.

A further ethical issue is that, while this study aims to inform practice regarding people with learning disabilities, the study is being carried out with carers, not with the clients themselves. This is not to deny the importance of the views of people with a learning disability. Rather the study acknowledges the influence that carers are likely to have over client diet and aims to explore this factor as a first step, with a view to ultimately bettering services for people with learning disabilities.

4.6 Strengths and Limitations of the Study

4.6.1 Strengths

The present study has several strengths. Firstly, it had a good sample size and there were few areas where data was missing, therefore the study had sufficient power, allowing appropriate statistical analysis.

Secondly, the study had a representative sample in terms of staff and clients they supported. Client support and carer working hours covered a wide spectrum, which is likely to reflect the heterogeneous needs of the people with learning disabilities supported by carers who took part in the current study. Additionally, the question on dietary requirements gave a good indication that, whilst most clients had no additional dietary needs, the biggest requirement recorded was a diet aimed at reducing clients' weight. In addition, these figures demonstrated that for a very few clients, the dietary requirement was weight gain. These findings seem to reflect the weight patterns found in the population of people with learning disabilities therefore, again suggesting the current study had a representative sample. Furthermore, the sample reflected the group of staff and clients that psychologists would be working with so it may be possible to generalise the results to the wider population of carers and clients.

Thirdly, adaptation of the Chambers *et al.*, (2007) questionnaire on parents' intentions to encourage healthy diet in their children appeared to be successful for the original model of TPB, with a medium effect size being predicted from both.

Lastly, this study is unique in examining TPB in carers of people with a learning disability and in relation to people with a learning disability at all, although it has been recommended that TPB be examined in relation to this group of people (Jones & Hastings, 2003). In addition, it is one of only three existing studies which begin to examine the use of TPB with a proxy group, such as parents of children. This study is therefore extending the literature in an important area.

4.6.2 Limitations

There were also a number of limitations to this study. These will be outlined below.

Measuring behaviour

The study examined carers' reported behaviour, rather than actual observed behaviour. A better methodology would be to examine actual diet over a time period. Some researchers have done this and found this observed behaviour generally is less positive than prospectively reported actual behaviour. Additionally they found that subjective self reports generally generated higher scores of the outcome behaviour than objective reports, such as from observation (Armitage & Conner, 2001). Self-reporting of actual behaviour, therefore is likely to result in an overestimation of actual behaviour. Measuring behaviour through observation was, however, beyond the scope of the present research project due to time constraints.

A related issue was the concern that staff may have been influenced by the social desirability of the answers, and may have particularly wished to answer in a manner which would be acceptable to their employers. The study did, however, take all possible measures to ensure carers felt safe in admitting their true thoughts and feelings in the questionnaire, including constructing sealed drop-off boxes and providing individual pre-paid, self-addressed envelopes. Additionally, a few carers did give negative responses to some questions which gives an indication that at least some carers felt safe to do so.

Generalisability

As mentioned earlier, a high proportion of carers (83 per cent) declared a positive intention to encourage clients to eat a healthy diet. Despite this high figure, there remain large numbers of people with learning disabilities who are obese. One possible reason for this could be due to the number of hours carers supported clients. The number of hours of support received by clients varied from 2-168 hours, a very large range and analysis within this was not within the scope of the current study. Care staff cannot directly influence what clients eat when they are not with them, hence clients may eat a poor diet when spending time with their families, at work, or

at day centres. Studies have indicated that people with learning disabilities who are more autonomous often have a more unhealthy diet as, for example, they may be more likely to eat microwave meals (Bechtel & Schreck, 2003). This may help to explain the disparity between carers' reported intentions and the picture presented when examining the statistics for obesity in clients.

Another issue pertaining to generalisability is that only 5 of the 19 care organisations which were approached agreed to take part in the study. It may be that these organisations had a particular interest in the healthy eating of clients and therefore had more positive results than would be expected in general. In particular, two of the organisations which took part were receiving input from clinical psychologists to tackle client obesity, therefore, it was an issue which was a salient in these organisations. It could thus be argued, that the results of the present study represent more positive attitudes towards healthy eating than may be found generally. This effect might have been lessened by recruiting participants only from those organisations who did not have specific input in relation to diet, however, this was precluded in the current study due to the need to obtain sufficient numbers of participants.

There is another possible reason for the discrepancy between the positive intentions' of carers and the prevalence of obesity in people with learning disabilities. Obesity is a multi-factorial issue and diet is only one component of this. As such, studying healthy eating behaviour cannot explain the whole picture. Also, the issue of healthy diet has only fairly recently become a focus of attention, for people in the general population and for people with a learning disability. Healthy eating interventions for people with learning disabilities are only now beginning to emerge, and reducing weight and improving health through diet takes time. It may yet be some time therefore, before this change in attitude and behaviours of carers' in encouraging clients' healthy diet is reflected in the weight and health of clients.

Adaptation of questionnaire

The questionnaire was adapted from a previously constructed questionnaire measuring parental intentions to encourage a healthy diet in children. Although the

self efficacy and self identity variables which were also adopted from the Chambers *et al.* (2007) study were non predictive in the current study, the adaptation process itself did not appear to have a negative effect on their predictive ability. Indeed, the measure of self efficacy was entirely unchanged in the current study. The measure of self identity incurred minor changes to make the wording pertain to 'clients' rather than 'children'. Additionally, only four of the nine original Chambers *et al.* (2007) questions pertaining to self identity were measured in the current study. However this change was made after discussion with the authors of the original paper who indicated that these questions had been omitted from their own analyses.

A problematic factor in the current study may have been the measurement of self efficacy with only one question. As has been true with regards to subjective norm, perhaps multiple measurement gives a truer picture of the variable. On the other hand, self efficacy scored very highly. It may be that the adaptation of these variables was not successful as they are not appropriate for the population, as discussed previously.

Missing data

The questionnaires were not all completed. This issue was not anticipated from the piloting of the questionnaire. It may have been that people who left responses blank did not understand what was being asked, although again this did not appear to be a difficulty in the pilot. An alternative might be that those who refrained from answering certain questions felt negatively about the particular issue but were not sure how to express this. If this were the case perhaps such responses would have changed the results, however as there were relatively few missing values overall it seems unlikely they would have altered the findings.

4.7 Further Research

4.7.1 Carer and Client Demographics

As mentioned above, the present study is one of very few which has examined the use of the TPB with individuals who provide input into the health behaviour of others. A closer examination of the demographics gives further insight into the population studied. Issues relating to gender, age and hours of support would be interesting areas for further study. The current study did not address these, as the main interest of the study was ascertaining if the original model of TPB was predictive of carers' intention to encourage clients to have a healthy diet. It was important to establish this before introducing additional factors such as demographic information. There would have been insufficient numbers to analyse the demographic factors in addition to this main research question in the present study. Some general demographic information on each of these factors and possible areas for further research within them will follow.

Gender

There is a clear gender difference in trends in the obesity literature as women with a learning disability are more overweight or obese than men (Bhaumik *et al.*, 2008; Emerson, 2005). As significantly more female staff supported female clients than male clients, it would be interesting to consider both the impact of gender of carer and client on the healthy eating propensities of the client.

Age

The clients ages ranged widely, however the majority fell within the 45-55 year age range. Older clients may have previously lived in institutions where they would have had very little choice over their diet. This may impact upon their ability to make choices now as well as the types of food they have become accustomed to. This in turn may impact upon carers, as literature illustrates that, as carers have become more aware of clients' personhood and rights to choice, they have attempted to

support their clients' choices, at times even if they might be detrimental to their health (Smyth & Bell, 2006). Whilst the move away from a generically paternalistic attitude is positive, carers and health professionals have been encouraged to allow clients to make a 'bad choice' which has been deemed harmless (Bannerman *et al.*, 1990). Smyth & Bell (2006) argued that allowing a client to make a 'bad choice' could sometimes be a failure to provide adequate care and could in fact be harmful to the client, even with regards to seemingly 'trivial' decisions about food. They also suggest that informed choice is not always being offered and that carers, and even health professionals are at times unaware of this.

Carers' ages also varied with most carers falling within the mid age range (35–44 years). Carer age may impact upon attitude to healthy eating, as generational changes in the perceptions of healthy eating and food preparation have been documented. In one study, it was found that older people (those over 55 years of age) thought of more traditional meals, including meat or fish, as a healthy diet whilst younger people (under 55 years) viewed healthy eating as consuming fruit and vegetables and avoiding sugary or fat-laden foods (Povey, 2000). In Povey's study however, the categorisation of the older group does not allow for a true comparison as no further information was given about the ages of participants in this over 55 years category. It is possible that there was a wide range of ages within this category and that people in the older end of this category may have had very different views from people who were in the younger end. The younger end of this category is important when thinking about carers as those aged 55 – 65 years in the Povey study are of working age. Older carers' therefore may or may not hold different attitudes to healthy eating than younger carers. Carers' attitude about healthy eating is important as the literature (Hamilton *et al.*, 2007), and the current study, illustrates the carers' attitudes are likely to have a knock-on effect on clients.

Hours of support

The percentage of support the client received from the carer ranged from 4.8 per cent to 100 per cent of the total care the client received, with the majority of carers, 77 in

total (69 per cent), supporting the client for up to 30 per cent of the total care provided by the organisation. It would be interesting to see if number of hours support was found to correlate with carers' intention to encourage the client's healthy eating in the next year. If this were the case, one supposition might be that clients with less support are more independent and therefore more able to make their own choices about diet. Another might be that staff providing less support work fewer hours overall and therefore are less likely to receive training, supervision or time with other staff, that might increase their intention to facilitate a healthy client diet.

Type of Carer

It would be interesting to carry out the current study with carers who were family members rather than staff, and to see if this impacted upon the inclusion of the additional variables as was discussed earlier. Previous literature indicates that people with learning disabilities who live with family carers often have a more unhealthy diet and are more likely to be obese than those who have support from care staff (Bhaumik *et al.*, 2008). Again this might be as a result of the values of the organisation compared with self identity of family members in relation to food. It would also be interesting to adapt the study to be carried out with people with a learning disability in order to see where the best interventions would be when dealing directly with the client group. This might be done using resources such as those mentioned in the earlier clinical implications section, for example, the Food Standards Association's balanced food plate (Appendix 1) could be adapted for use with people with learning disabilities, perhaps using concrete objects (i.e. a plate and food) to make this more readily understood by the client group. Likewise, their online resources could be delivered, with support, as part of a training programme for people with learning disabilities. Another suggestion would be to incorporate the use of the computer based programs and / or the 'Shape Up' DVD into a training package for people with learning disabilities.

Theory of Planned Behaviour

Further research should be carried out regarding the variables of TPB in this population and their predictive ability. As previously discussed, it may be that the

additional variables used in this study were not appropriate for this population. Therefore further research should attempt to identify population appropriate additional variables. Furthermore, measurement of the original TPB variables may be improved by revising the measurement of the components of each variable. The current study used components previously found to be reliable in a population of parents and it may be that there are differences for carers of people with learning disabilities.

Another important piece of further research would be to examine in more detail the components from which the predictive variables are constructed, in order to increase their predictive ability and determine any specific targets for intervention. For example, within the attitude variable, it may be that staff believe encouraging a healthy diet will have negative behavioural consequences in clients who enjoy eating unhealthy foods such as chips or chocolate, or that it is unfair to deny the client the enjoyment. Again, this was out-with the scope of the current study however it may be an interesting avenue for further investigation. If such an issue were found to have an effect, it would be important to explain to carers that any negative reactive behaviour would quickly dissipate with perseverance on their part (as with any extinction behaviour) and to emphasise the benefit to behaviour and food enjoyment, and health gain, for the client in the long term.

Another example of a component of the attitude variable which may be interesting to examine is the impact of diet upon self esteem. Self esteem has been found to be negatively impacted upon by poor diet (Abraham *et al.*, 2002). Carers may even believe that clients' self esteem is unaffected by their unhealthy eating and weight issues. Carers may feel that the client is unaware of the social desirability factor of healthy eating and not being overweight/obese and may even believe that educating the client about this will decrease their self esteem. One possibility for tackling this could be to educate carers that eating a healthier diet and not being overweight/obese will be likely to increase the client's mobility and ability to undertake certain activities, which would be likely to have a positive effect on their self esteem (Abraham *et al.*, 2002).

Type of study

Finally, the current study was based on the Chambers *et al.*, (2007) study, as it was hypothesised that many of the factors which affected parents caring for children may also affect carers supporting clients with a learning disability. A benefit of using this design was that the questionnaire had already been validated and found to be reliable. Furthermore, it was felt that a quantitative study would add more to the literature base than a qualitative study. Whilst qualitative research gives a snapshot of how things might be for a certain group of people at a certain time, quantitative analysis is more generalisable and therefore it was thought would have the biggest impact. Another reason for carrying out a quantitative study was that there are relatively few like this in the literature, although some qualitative work has been carried out. Previous qualitative studies have demonstrated the conflict between promoting choice and healthy living (e.g. Young, 2007; McKenzie *et al.*, 2001). It might be interesting to use semi-structured interviews to examine carers' opinions on clients' healthy diet and perhaps make up questionnaire measures based upon this for a future quantitative study as there might be slightly different responses in this population.

With regards to the additional variables of self efficacy and self identity, future research should continue to examine whether these variables are predictive in proxy populations. It would be interesting to see whether the predictive value of self identity varies with the degree of corporate identity of an organisation.

Other factors

The present study focussed on improving health through improving healthy diet however a similar study examining physical activity levels in people with a learning disability seems an important next step. As previously outlined, causes of obesity are multi-factorial. Diet and physical activity should be tackled together in order to best improve weight and health (Butland *et al.*, 2008). This would appear to be true for both the general population and for people with learning disabilities (Rotatori *et al.*, 1981).

4.8 Conclusions

Current government and health board focus is on improving the nations' health through improving diet and exercise. There is very little literature about healthy eating in people with a learning disability, however it is well known that this group of people are often underweight, overweight or obese and that this leads to a variety of ill health consequences. Care staff play an important role in the lives of people with learning disabilities, providing support and aiding them to live independently and in supported accommodation. It is important that carers assist people with learning disabilities to make informed choices about issues in their lives, including healthy eating. It has been postulated that carers' own beliefs and values influence people with learning disabilities. Furthermore, literature has suggested that at times unhealthy choice has been inadvertently encouraged and carers have not recognised that clients' choices have not been informed.

In the current study the original TPB model accounted for 31 per cent of the variance, a medium effect size, in line with many previous findings. The extension of the model to include the variables of self efficacy and self identity overall did not improve the predictive model, rendering three of the variables non-predictive. The findings of the current study indicate that the original TPB, consisting of attitude, subjective norm and perceived behavioural control variables would appear to be a useful predictive model to use with care staff in order to predict intention to encourage healthy eating in clients.

In the current study, attitude was not more predictive than the other variables in the model of TPB. This was in contrast to the results of previous research which indicated that subjective norm had the least predictive power in the model of TPB and that attitude was the most predictive variable. It is likely that the multiple measures of subjective norm in the current study are responsible for the increase in its predictive power.

Although this study may have garnered results on the more positive end of the spectrum, perhaps due in part to the interest of the participants, the study indicates

possible routes for interventions. Educating and training carers about the potential benefits of healthy eating for clients, and educating clients about healthy eating and making informed choices with regard to diet are suggested interventions. It will also be important to educate carers and managers of organisations about striking the right balance with regards to enabling choice whilst retaining duty of care.

The present study has identified many avenues for future research. It suggests that there should be further exploration of the predictive power of TPB in proxy populations in order to add to the evidence base about its' efficacy in such populations. Further exploration of the components of variables within the carer population has also been recommended, with a view to increasing the predictive power of the model. Using longitudinal, non-self-reported measures of actual behaviour would add to the evidence base regarding the efficacy of TPB. It has also been suggested that a repetition of the current project should be carried out with family carers and with people who have a learning disability, in order to determine the best predictors and thereby develop appropriate interventions for each group. Furthermore, it is important to note that a healthy diet is just one factor which contributes towards health. Level of physical activity is another main factor and perhaps TPB should be used to examine physical activity levels in the same manner.

In summation, the results of this study indicate that the Theory of Planned Behaviour, and its application to carers' intentions to encourage clients' healthy eating, may be a useful tool in improving the health of people with learning disabilities. Appropriate interventions may be developed as a result. Further research in this area is required.

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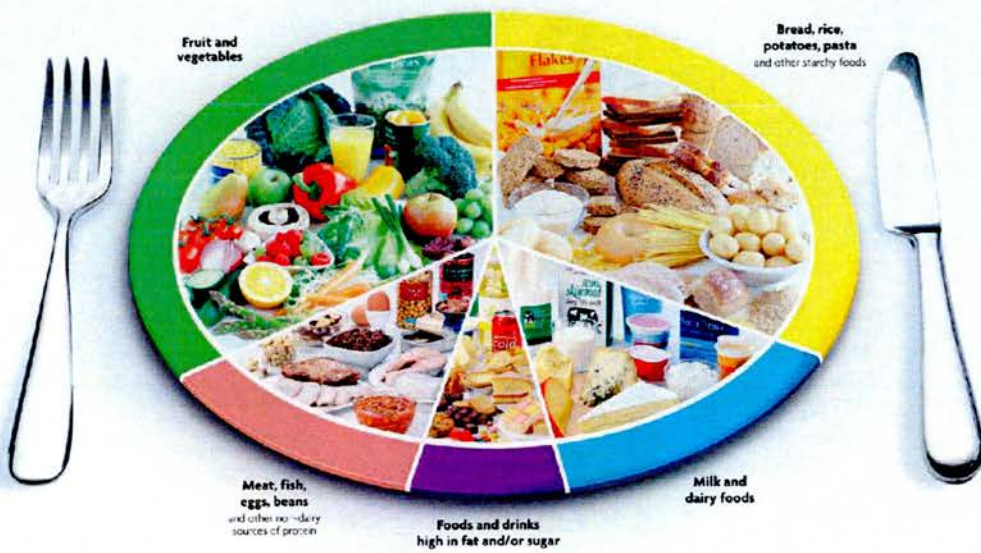
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6. APPENDICES

Appendix 1: Food Standards Association Food Plate

The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.



Appendix 2: Ethics Correspondence

From: drkmckenzie@hotmail.com
To: catherine_m_smyth@yahoo.co.uk
Subject: RE: Redrafted submission to Cog
Date: Mon, 23 Jun 2008 10:11:19 +0000

Hi,

We had our research/ethics meeting today and here are the points to address (nothing major):

1. The panel felt it was really important to emphasise the anonymity and confidentiality of the project and that service managers would not have access to the data. One suggestion was to have a consent form that had tick boxes indicating that they'd read the info and agreed to take part and only needed to give their name and details if they wanted more info about the project.
2. The panel wanted the questionnaire to be filled in in relation to one particular client (rather than say the staff member trying to think about three clients they supported). Likewise, if 4 staff members supported the same client, it was felt that only one staff member (e.g. key-worker) should complete the questionnaire in relation to them.
3. It was suggested that where we have put 'actual behaviour' e.g. box 2: hypotheses, we should stress that this is measured by self -report i.e. it is not observed behaviour.
4. Under power calculation, it was suggested that you get the effect size from the authors, so that you can calculate accurately. If it is a medium effect size, Dave said 74 people are sufficient -but that you need to stress that you only have 3 predictor variables.

There isn't a need for the project to come back to the research/ethics panel, so these suggestions are to help you with the study itself. Hopefully NRES will confirm that you don't need to submit a full ethics proposal and you can get started.

Let me know if any of this is unclear.

Best wishes

Karen

RE: Redrafted submission to Cog
Thursday, 26 June, 2008 10:07 AM
From: "Karen McKenzie" <drkmckenzie@hotmail.com>
To: catherine_m_smyth@yahoo.co.uk

Hi Catherine,

I've copied the actual comments from the minutes below. The issue with care staff only completing in relation to one client is to keep the data independent. Dave said that it could be argued both ways (and he'd had a similar debate with a statistician in the past), but that the statistician was adamant that the data should be kept independent. We can chat more about this and the best way of doing it, when it comes to carrying out the study.

Karen

Catherine Smyth

This was considered an interesting and worthwhile study. The ethics panel agreed to approve the project subject to it satisfactorily addressing points (a-f) below:

- a) Steps should be outlined to ensure both the actual anonymity and the perceived anonymity of the questionnaire. It was recommended that individuals have the option to either return their questionnaire by post or to return it to a locally placed box. The consent form itself could be tick box only, with an optional separate sheet enclosed for participants to give contact details if they wish to be kept informed about the study etc.
- b) The behaviour that the dependent variables are being used to predict should be clarified further.
- c) The study should ensure that data remains independent from each other. Thus individual staff members should complete no more than one questionnaire and steps should be taken to ensure that no two staff members complete the questionnaire in relation to the same client.
- d) In relation to exclusion criteria, some clarification should be added on how carer literacy levels will be determined.
- e) The power calculation should refer to the number of predictor variables. The proposed numbers seem reasonable based on a median effect size.
- f) The local NHS ethics committee should be sent a copy of the revised thesis proposal form and asked to advise in writing whether full NRES approval is required.

Additional advice from the ethics panel members included that:

Project should consider whether staff should complete questionnaires in relation to those without choice over their diet. Staff attitudes (which it seems this study is addressing) may be particularly important where the clients themselves have no or

very restricted control over their diet. Perhaps a brief Likert type measure of the perceived degree of patient control over their diet could be included.

It may be beneficial for the study to be introduced by the research team rather than by the local management.

Deaconess House

148 Pleasance

Edinburgh

EH8 9RS

Name: Catherine Smyth
Address: 24/6 Causewayside,
Newington,
Edinburgh,
EH9 1QB

Date: 04/07/2009
Your Ref:
Our Ref: NR/0708/18
Enquiries Alex Bailey
to:
Extension:
Direct 0131 536 9050
Line:
Email: alex.bailey@nhslothian.scot.nhs.uk

Dear Catherine,

Full title of project: Using the Theory of Planned Behaviour as a model to examine carers impact on health-related food choice of people with a Learning Disability

You have sought advice from the South East Scotland Research Ethics Service on the above project. This has been considered by the Scientific Officer and you are advised that, based on the submitted documentation (Thesis Proposal Form, 23/07/08), it does not need NHS ethical review under the terms of the Governance Arrangements for Research Ethics Committees in the UK. The advice is based on the following:

- *The participants are neither patients nor relatives or carers of patients (recruited for this reason) nor are they NHS staff or medical students.*
- *The project is an opinion survey seeking the views of the public at large on service delivery.*
- *Recruitment is invitational and responses to the questionnaire are fully anonymous so that the respondent's identity is fully protected.*

You may wish to inform your local R&D Office/clinical effectiveness unit of your intention to run the project in individual NHS Board areas so that they can give consideration to the need to register with the local R&D office.

Please note that this advice is issued on behalf of the Research Ethics Service and does not constitute a favourable opinion or an endorsement from a Research Ethics Committee. It may be provided to journal editors, conference organisers or others who require evidence of consideration of the need for ethical review prior to publication or presentation of your results. If you wish you may still decide to apply to a REC, but note that a retrospective ethical opinion cannot be given.

You should retain a copy of this letter with your project file as evidence that you have sought advice from the South East Scotland Research Ethics Service.

Yours sincerely,

Alex Bailey
Scientific Officer
South East Scotland Research Ethics Service
Enclosure: NRES leaflet - "Defining Research"

DIFFERENTIATING AUDIT, SERVICE EVALUATION AND RESEARCH

November 2006

The "Ad Hoc Advisory Group on the Operation of NHS Research Ethics Committees" recommended NRES should develop guidelines to aid researchers and committees in deciding what is appropriate or inappropriate for submission to RECs, and NRES (with the Health Departments and with advice from REC members) has prepared the guidelines in the form of the attached table.

RESEARCH	CLINICAL AUDIT	SERVICE EVALUATION
The attempt to derive generalisable new knowledge including studies that aim to generate hypotheses as well as studies that aim to test them.	Designed and conducted to produce information to inform delivery of best care.	Designed and conducted solely to define or judge current care.
Quantitative research – designed to test a hypothesis. Qualitative research – identifies/explores themes following established methodology.	Designed to answer the question: “Does this service reach a predetermined standard?”	Designed to answer the question: “What standard does this service achieve?”
Addresses clearly defined questions, aims and objectives.	Measures against a standard.	Measures current service without reference to a standard.
Quantitative research -may involve evaluating or comparing interventions, particularly new ones. Qualitative research – usually involves studying how interventions and relationships are experienced.	Involves an intervention in use ONLY. (The choice of treatment is that of the clinician and patient according to guidance, professional standards and/or patient preference.)	Involves an intervention in use ONLY. (The choice of treatment is that of the clinician and patient according to guidance, professional standards and/or patient preference.)
Usually involves collecting data that are additional to those for routine care but may include data collected routinely. May involve treatments, samples or investigations additional to routine care.	Usually involves analysis of existing data but may include administration of simple interview or questionnaire.	Usually involves analysis of existing data but may include administration of simple interview or questionnaire.
Quantitative research - study design may involve allocating patients to intervention groups. Qualitative research uses a clearly defined sampling framework underpinned by conceptual or theoretical justifications.	No allocation to intervention groups: the health care professional and patient have chosen intervention before clinical audit.	No allocation to intervention groups: the health care professional and patient have chosen intervention before service evaluation.
May involve randomisation	No randomisation	No randomisation
ALTHOUGH ANY OF THESE THREE MAY RAISE ETHICAL ISSUES, UNDER CURRENT GUIDANCE:-		
RESEARCH REQUIRES R.E.C. REVIEW	AUDIT DOES NOT REQUIRE R.E.C. REVIEW	SERVICE EVALUATION DOES NOT REQUIRE R.E.C. REVIEW

Appendix 3: Original Questionnaire (Chambers *et al.*, 2007)

Q20) Given your present circumstances, suppose you won a tax-free prize at a local bank and were offered a choice between two prizes. For **each pair** please circle which prize you would choose.

£1,500 now or	0	£4,000 in 5 years time	1
£1,000 now or	0	£2,500 in 3 years time	1
£4,000 now or	0	£6,000 in 4 years time	1
£750 now or	0	£1,250 in 1 years time.	1
£2,500 now or	0	£4,000 in 3 years time	1
£500 now or	0	£2,500 in 4 years time	1

Q21a) Do you smoke?

Yes
No

1
0 **Go to Q22**

21b) Roughly how many cigarettes a day do you usually smoke?

Q22) How many alcoholic drinks do you have in an average week?

We would like to ask you some questions on your children's eating habits.

Healthy eating guidelines suggest that, each week, children should try to eat:

- 5 or more portions per day of fruit and vegetables
- two portions of fish – one of which should be oily fish (eg. salmon, mackerel, or fresh tuna)
- Meals with significant amounts of starchy foods like potatoes, pasta, rice, bread, and cereal. Most of these should be unrefined (e.g. wholemeal bread, brown rice, wholewheat pasta)
- Limited amounts of dairy, preferably lower fat products
- Limited amounts of meat, preferably poultry and leaner cuts of red meat
- A very small amount of sugar and fats (eg soft drinks, chocolate, fried foods)

Please could you answer the following questions thinking about your child with the most recent birthday.

	Not closely at all						Very closely
Q23) On average, over the past year how closely has your child kept to the recommended eating guidelines outlined on the previous page.	1	2	3	4	5	6	7
Q24) How closely do you intend to keep to these recommendations for your child during the next year?	1	2	3	4	5	6	7

Q25) How confident are you that you will be able to give your child a healthy diet during the next year?	Not confident at all						Very confident
	1	2	3	4	5	6	7

Please could you tell us how unlikely or likely you find the following statements.

Q26) For my child, eating a healthy diet during the next year will:	Very unlikely						Very likely
Control their weight.	1	2	3	4	5	6	7
Give them more energy.	1	2	3	4	5	6	7
Keep them in good shape.							
Aid their concentration at school.	1	2	3	4	5	6	7
Improve their behaviour.	1	2	3	4	5	6	7
Help their long term health prospects.	1	2	3	4	5	6	7
Make them enjoy their food	1	2	3	4	5	6	7
Help them feel good about themselves	1	2	3	4	5	6	7
Reduce their chances of obesity .	1	2	3	4	5	6	7
Reduce their chances of anorexia.	1	2	3	4	5	6	7

Q27) How important to you is:	Not important at all						Very important
Controlling your child's weight?	1	2	3	4	5	6	7
Giving your child more energy?	1	2	3	4	5	6	7
Keeping your child in good shape?	1	2	3	4	5	6	7
Aiding your child's concentration at school?	1	2	3	4	5	6	7
Improving your child's behaviour?	1	2	3	4	5	6	7
Helping your child's long term health prospects?	1	2	3	4	5	6	7
Making your child enjoy food more?	1	2	3	4	5	6	7
Helping your child to feel good about themselves?	1	2	3	4	5	6	7
Reducing your child's chances of obesity?	1	2	3	4	5	6	7
Reducing your child's chances of anorexia?	1	2	3	4	5	6	7

Q28) How much personal control do you feel you have over giving your child a healthy diet during the next year?	No control						Complete control
	1	2	3	4	5	6	7

Q29)	Disapprove						Approve	N/A
Would your child disapprove/approve about eating a healthy diet during the next year?	1	2	3	4	5	6	7	
Would your partner disapprove/approve of your child eating a healthy diet during the next year?	1	2	3	4	5	6	7	8
Would your friends disapprove/approve of your child eating a healthy diet during the next year?	1	2	3	4	5	6	7	

Q30) How often do you feel:	Never						Frequently
I do not have enough time to give my child a healthy diet.	1	2	3	4	5	6	7
Giving my child a healthy diet costs too much money.	1	2	3	4	5	6	7
Giving my child a healthy diet is inconvenient.	1	2	3	4	5	6	7
I don't always know which foods are necessary for a healthy diet.	1	2	3	4	5	6	7
Giving my child a healthy diet means having arguments with my child that I would rather avoid.	1	2	3	4	5	6	7
Giving my child a healthy diet means that I have to cook.	1	2	3	4	5	6	7
Giving my child a healthy diet doesn't matter because they choose their own food.	1	2	3	4	5	6	7
I cannot control my child's diet because they can spend their pocket money on unhealthy snacks if they wish.	1	2	3	4	5	6	7
Giving my child a healthy diet is difficult away from home.	1	2	3	4	5	6	7

How likely are these factors to stop you from giving your child a healthy diet during the next year?

Q31)	Very unlikely						Very likely
Not having enough time.	1	2	3	4	5	6	7
Costing too much money.	1	2	3	4	5	6	7
Inconvenience	1	2	3	4	5	6	7
Not always knowing which foods are necessary.	1	2	3	4	5	6	7
Having arguments with my child that I would rather avoid.	1	2	3	4	5	6	7
Having to cook.	1	2	3	4	5	6	7
Your child choosing their food for themselves.	1	2	3	4	5	6	7
Your child spending their pocket money on unhealthy snacks if they wish.	1	2	3	4	5	6	7
Being difficult away from home.	1	2	3	4	5	6	7

How strongly do you disagree or agree with the following statements.

Q32)	Strongly disagree						Strongly agree
I think of myself as a "healthy eater".	1	2	3	4	5	6	7
My principles dictate that I should give my child a healthy diet during the next year.	1	2	3	4	5	6	7
I think of myself as someone who enjoys the pleasures of eating.	1	2	3	4	5	6	7
I feel obliged to give my child a healthy diet during the next year.	1	2	3	4	5	6	7
I think of myself as someone who is concerned with healthy eating.	1	2	3	4	5	6	7
It is morally wrong for me to give my child an unhealthy diet during the next year.	1	2	3	4	5	6	7

	Strongly disagree						Strongly agree
I would feel guilty if I gave my child an unhealthy diet during the next year.	1	2	3	4	5	6	7
I think of myself as someone who is concerned about the health consequences of what I eat.	1	2	3	4	5	6	7
I would feel regret if I gave my child an unhealthy diet during the next year.	1	2	3	4	5	6	7

Q33) I want to do what:	Strongly disagree						Strongly agree	N/A
My child approves of	1	2	3	4	5	6	7	
My partner approves of	1	2	3	4	5	6	7	8
My friends approve of.	1	2	3	4	5	6	7	

Q34a) Thinking about your child at school, would you say that they are...

Very physically active	4
Fairly physically active	3
Not very physically active	2
Or not at all physically active?	1

Q34b) And in their leisure time, would you describe them as...

Very physically active	4
Fairly physically active	3
Not very physically active	2
Or not at all physically active?	1

Appendix 4: Adapted Questionnaire

Food & Health Research Questionnaire

I would like to ask you some questions on your client's eating habits.

Healthy eating guidelines suggest that, each week, people should try to eat:

- **5 or more** portions per day of **fruit and vegetables**
- **Two** portions of **fish** – one of which should be oily fish (eg. salmon, mackerel, or fresh tuna)
- Meals with significant amounts of **starchy foods** like potatoes, pasta, rice, bread, and cereal (Most of these should be unrefined (e.g. wholemeal bread, brown rice, wholewheat pasta)
- **Limited** amounts of **dairy**, preferably lower fat products
- **Limited** amounts of **meat**, preferably poultry and leaner cuts of red meat
- A **very small** amount of **sugar** and **fats** (eg soft drinks, chocolate, fried foods)

Please could you answer the following questions on food and health whilst keeping in mind a client you are key-worker for. This client must not be tube fed and must not have a diagnosis of Prader-Willi Syndrome.

	Not closely at all							Very Closely
Q1) On average, over the past year how closely has your client kept to the recommended eating guidelines outlined above.	1	2	3	4	5	6	7	
Q2) How closely do you intend to keep to these recommendations for your client during the next year?	1	2	3	4	5	6	7	

	Not confident at all							Very confident
Q3) How confident are you that you are able to give your client a healthy diet?	1	2	3	4	5	6	7	

Please could you tell us how unlikely or likely you find the following statements.

Q4) For my client, eating a healthy diet during the next year will:	Very unlikely							Very likely
Control their weight.	1	2	3	4	5	6	7	
Give them more energy.	1	2	3	4	5	6	7	
Keep them in good shape.	1	2	3	4	5	6	7	
Aid their concentration.	1	2	3	4	5	6	7	
Improve their behaviour.	1	2	3	4	5	6	7	
Help their long term health prospects.	1	2	3	4	5	6	7	
Make them enjoy their food.	1	2	3	4	5	6	7	
Help them feel good about themselves.	1	2	3	4	5	6	7	
Reduce their chances of obesity	1	2	3	4	5	6	7	
Reduce their chances of anorexia	1	2	3	4	5	6	7	

Q5) How important to you is:	Not important at all							Very important
Controlling your client's weight?	1	2	3	4	5	6	7	
Giving your client more energy?	1	2	3	4	5	6	7	
Keeping your client in good shape?	1	2	3	4	5	6	7	
Aiding your client's concentration?	1	2	3	4	5	6	7	
Improving your client's behaviour?	1	2	3	4	5	6	7	
Helping your client's long term health prospects?	1	2	3	4	5	6	7	
Making your client enjoy food more?	1	2	3	4	5	6	7	
Helping your client to feel good about themselves?	1	2	3	4	5	6	7	
Reducing your client's chances of obesity?	1	2	3	4	5	6	7	
Reducing your client's chances of anorexia?	1	2	3	4	5	6	7	

Q6)	Disapprove							Approve	N/A
Does your client disapprove /approve about eating a healthy diet?	1	2	3	4	5	6	7		
Does your client's family disapprove/approve about your client eating a healthy diet?	1	2	3	4	5	6	7	8	
Do other staff disapprove /approve of your client eating a healthy diet?	1	2	3	4	5	6	7		
Does management disapprove /approve of your client eating a healthy diet?	1	2	3	4	5	6	7		

Q7) How often do you feel:

	<div style="display: flex; justify-content: space-between; width: 100%;"> Never Frequently </div>						
I do not have enough time to give my client a healthy diet.	1	2	3	4	5	6	7
Giving my client a healthy diet costs too much money.	1	2	3	4	5	6	7
Giving my client a healthy diet is inconvenient.	1	2	3	4	5	6	7
I don't always know which foods are necessary for a healthy diet.	1	2	3	4	5	6	7
Giving my client a healthy diet means having arguments with my client that I would rather avoid.	1	2	3	4	5	6	7
Giving my client a healthy diet means that I have to cook.	1	2	3	4	5	6	7
Giving my client a healthy diet doesn't matter because they choose their own food.	1	2	3	4	5	6	7
I cannot control my client's diet because they can spend their money on unhealthy snacks if they wish.	1	2	3	4	5	6	7
Giving my client a healthy diet is difficult away from home.	1	2	3	4	5	6	7

Q8) How likely are these factors to stop you from giving your client a healthy diet?

	Very unlikely							Very likely						
Not having enough time.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Costing too much money.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Inconvenience	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Not always knowing which foods are necessary.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Having arguments with my client that I would rather avoid.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Having to cook.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Your client choosing their food for themselves.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Your client spending their money on unhealthy snacks if they wish.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Being difficult away from home.	1	2	3	4	5	6	7	1	2	3	4	5	6	7

Q9) How strongly do you disagree or agree with the following statements.

	Strongly disagree							Strongly agree						
I think of myself as a "healthy eater".	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I think of myself as someone who enjoys the pleasures of eating.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I think of myself as someone who is concerned with healthy eating.	1	2	3	4	5	6	7	1	2	3	4	5	6	7
I think of myself as someone who is concerned about the health consequences of what I eat.	1	2	3	4	5	6	7	1	2	3	4	5	6	7

Q10) I want to do what:	Strongly disagree							Strongly agree		N/A
	1	2	3	4	5	6	7	8		
My client approves of	1	2	3	4	5	6	7			
My client's family approves of	1	2	3	4	5	6	7	8		
Other staff approve of	1	2	3	4	5	6	7			
Management approves of.	1	2	3	4	5	6	7			

I would like to ask you some more general questions about you and your client.

Q11) Please tell me if there are any special dietary requirements your client has:

Q12) Please tell me how many hours per week you personally (not the organisation) support the client:

I support my client _____ hours per week.

Q13) Please tell me how many hours per week your organisations supports your client:

My organisation supports my client _____ hours per week.

Q14) Please select your age:

Your age	Please tick
18-24	
25-34	
35-44	
45-54	
55-64	
65+	

Q15) Please select your gender

Your gender	Please tick
Male	
Female	

Q16) Please select your client's age:

Your client's age	Please tick
18-24	
25-34	
35-44	
45-54	
55-64	
65+	

Q17) Please select your client's gender:

Your client's gender	Please tick
Male	
Female	

Thank you for taking the time to participate in this study

Appendix 5: Carer Information Sheet

Food & Health Research – Information Sheet

I would like to invite you to take part in a study seeking your opinion about food, diet and health.

This questionnaire asks about food, healthy eating, weight and lifestyle. Some of the questions will ask about yourself. Many of the questions will ask about a person with Learning Disabilities. Your answers will be anonymous. The questionnaire will take between 5-10 minutes to complete.

If you decide to take part, please answer the questions keeping in mind one client who you are a key-worker for. This client must not be tube fed and must not have a diagnosis of Prader-Willi Syndrome. Only one key-worker may fill out the questionnaire in relation to each client. Please complete only one questionnaire.

Please leave completed questionnaires in the box provided or return them to me by post at the address provided below.

Completed questionnaires will be stored securely. They will only be accessed by researchers working as part of this project. Participation in this research is voluntary. If you do decide to take part, you may withdraw from the study at any point. To withdraw, please contact me (contact details below) and quote the reference number at the top of this page.

If you wish to receive any further information about this research project, or about the outcome of this study, please complete and return the optional contact details sheet attached or do not hesitate to contact me:

Catherine Smyth

Trainee Clinical Psychologist
Department of Public Health
Deaconess House
148 Pleasance
Edinburgh, EH8 9RS

Telephone: 07944 644 287

Appendix 6: Consent Form

Consent Form

If you would like to participate in this study, please return this completed section at the same time as you return your completed questionnaire.

I consent to take part in the above study. I feel satisfied with the information I have been given about the study and I understand that I may withdraw at any stage, for any reason, if I should wish to do so.

Please tick
box

Appendix 7: Individual Contact Sheet

Your Contact Details (Optional)

If you wish to remain informed about this study please complete and return this optional contact details form.

Name:

Organisation:

Telephone no:

Email address:

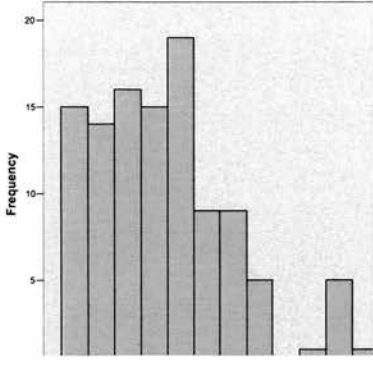
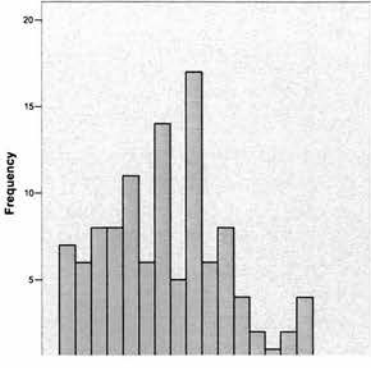
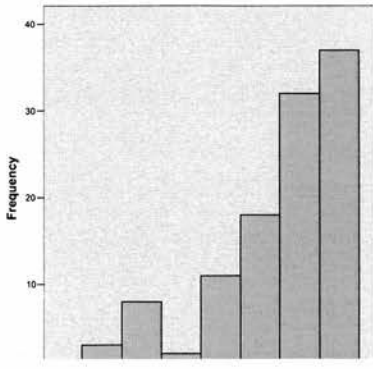
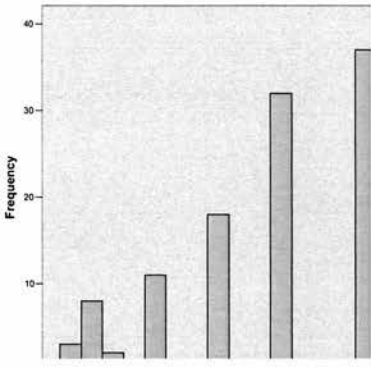
Appendix 8: Analysis of Carer and Client Ages and Gender

Carer and Client Age and Gender

		Age						Total
		18-24	25-34	35-44	45-54	55-64	65+	
Carers	Male	3 (2.7%)	10 (8.9%)	17 (15.2%)	8 (7.1%)	8 (7.1%)	0 (0%)	46 (41.1%)
	Female	13 (11.6%)	16 (14.3%)	20 (17.9%)	12 (10.7%)	5 (4.5%)	0 (0%)	66 (58.9%)
	Total	16 (14.3%)	26 (23.2%)	37 (33.1%)	20 (17.8%)	13 (11.6%)	0 (0%)	112 (100%)
Clients	Male	2 (1.8%)	4 (3.6%)	18 (16.1%)	17 (15.2%)	12 (10.7%)	6 (5.4%)	59 (52.7%)
	Female	4 (3.6%)	3 (2.7%)	10 (8.9%)	20 (17.9%)	12 (10.7%)	4 (3.6%)	53 (47.3%)
	Total	6 (5.4%)	7 (6.3%)	28 (25%)	37 (33.1%)	24 (21.4%)	10 (9%)	112 (100%)

Appendix 9: Histograms

	Distribution	Distribution adjusted for skew
<p>Intention</p> <p>(Adjustment: Squared)</p>	<p>A histogram showing the frequency distribution of 'Intention'. The y-axis is labeled 'Frequency' and ranges from 0 to 50. The distribution is right-skewed, with a peak frequency of approximately 41. The bars represent the frequency of each value, with the highest frequency occurring at the highest value shown.</p>	<p>A histogram showing the frequency distribution of 'Intention' after adjustment for skew. The y-axis is labeled 'Frequency' and ranges from 0 to 50. The distribution is more symmetric and bell-shaped compared to the original distribution, with a peak frequency of approximately 41.</p>
<p>Attitude</p> <p>(Adjustment: Squared)</p>	<p>A histogram showing the frequency distribution of 'Attitude'. The y-axis is labeled 'Frequency' and ranges from 0 to 20. The distribution is right-skewed, with a peak frequency of approximately 20. The bars represent the frequency of each value, with the highest frequency occurring at the highest value shown.</p>	<p>A histogram showing the frequency distribution of 'Attitude' after adjustment for skew. The y-axis is labeled 'Frequency' and ranges from 0 to 15. The distribution is more symmetric and bell-shaped compared to the original distribution, with a peak frequency of approximately 15.</p>
<p>SN</p> <p>(Adjustment: Squared)</p>	<p>A histogram showing the frequency distribution of 'SN'. The y-axis is labeled 'Frequency' and ranges from 0 to 20. The distribution is right-skewed, with a peak frequency of approximately 17. The bars represent the frequency of each value, with the highest frequency occurring at the highest value shown.</p>	<p>A histogram showing the frequency distribution of 'SN' after adjustment for skew. The y-axis is labeled 'Frequency' and ranges from 0 to 20. The distribution is more symmetric and bell-shaped compared to the original distribution, with a peak frequency of approximately 16.</p>

<p>PBC</p> <p>(Adjustment: Square root)</p>		
<p>SE</p> <p>(Adjustment: Squared)</p>		
<p>SI</p> <p>(Adjustment: Squared)</p>	