Evaluation of a correspondence fat loss program for men

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EVALUATION OF A CORRESPONDENCE FAT LOSS PROGRAM FOR MEN.

A thesis submitted in partial fulfilment of the requirement for the award of the degree of

MASTER OF PUBLIC HEALTH (HEALTH PROMOTION)

UNIVERSITY OF WOLLONGONG

by

Anne-Maree Parrish

GRADUATE SCHOOL OF HEALTH AND MEDICAL SCIENCES
UNIVERSITY OF WOLLONGONG
1995
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ACKNOWLEDGMENTS

Heather Yeatman for her supervision, encouragement and wisdom in the past twelve months.

Charles Watson for co-supervising, for his advice and for the opportunity to research in the area of fat control.

Ken Russell for assisting in my statistical analysis.

The GutBusters staff, special thanks to Anne O’Neill, for her patience, assistance and hard work; thanks to Matt O’Neill and Garry Egger for giving me the opportunity to be involved in the GutBusters program; thanks to those staff who were unknown to me, but assisted behind the scenes.

The participants who gave their time to be involved in this study, and made it possible.

John and Cheryl who offered valuable information about computer difficulties.

Barbara and Lorna for their assistance in the last twelve months.

To my baby Tomas for being an angel as I have studied over the past twelve months and special thanks to my wonderful husband Greg, for his hard work and support over the past three years (my rock).
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ABSTRACT

This study compares fat loss of 45 Australian men involved in a correspondence ‘waist’ loss program with participants in a group based ‘waist’ loss program (O’Neill 1993). The format of the correspondence program and the group based program is very similar. Initially, it was believed that the group based program may be more effective than the correspondence program, as the men in the correspondence program did not have group support.

The correspondence participants received a kit containing audio cassettes, book, handouts and a tape measure to enable them to conduct their waist loss program at home. Evaluation questionnaires were posted to the participants at the beginning and end of the six week fat loss program. They sent their waist measure into the program office at the end of each week. Hip measures were sent in at week one and week six of the program. The men in the group based program attended sessions for two hours, once a week, over a six week period. They received lectures, handouts, a book, and tape measure during the program. They completed their pre- and post-evaluation questionnaire at week one and week six of the program. Waist and hip measures were taken during the program at the same intervals as the correspondence course.

The average change in waist loss of the correspondence participants was statistically significant at -6.2 percent (t = 18.6, df = 44, p < 0.001). The percentage reduction in
the waist/hip ratio (WHR) was 3.35 percent, this figure also was statistically significant
\(t=8.88, \text{df}=44, p < 0.001\). The average change in waist loss in the group based
program was -6.68 percent. The average change in waist hip ratio (WHR) was -3.7 percent. Seventy two percent of the correspondence participants and 73 percent of the
group based participants were successful in achieving the program goal of a five
percent waist reduction. There was no statistically significant difference between the
results of participants in the correspondence program and those in the group based
program.

Overall the changes achieved in the participant’s dietary fat consumption, alcohol
consumption and exercise behaviours in the GutBusters correspondence program were
similar to those in the group based program.
The GutBusters program is a commercial fat loss program, designed to meet the needs of the over fat Australian male population. Since the program began in 1992, it has diversified from the group based fat loss program to include an advanced program and a correspondence program. This study investigates the effectiveness of the GutBusters correspondence program and compares it to the group based GutBusters program. This appears to be the first Australian study to compare a correspondence fat loss program with a group based fat loss program.

The main aim of the GutBusters program is to reduce male abdominal obesity so as to decrease individual health risk (Robison et al 1993). There are several key factors which appear to be associated with the success of the program: it educates men about basic scientific principles of energy exchange (Egger et al 1995); it utilises waist loss as opposed to weight loss as a measure of program and individual success; it concentrates on ‘over fat’ individuals, rather than overweight, as some people can be overweight without carrying unhealthy amounts of body fat (Egger and Mowbray 1993); it encourages gradual lifestyle changes, which are not too dramatic, so as to increase the likelihood of them being maintained (Egger and Mowbray 1993).
The GutBusters correspondence program was designed to offer the same information as the group based program to 'over fat' Australian men, without them having to attend weekly meetings. The lectures are provided on audio cassette, making them more accessible than the group based program.

1.1 Aims of the Study.

Previous studies (O'Neill, 1993; Bolton, 1994) have verified the effectiveness of the GutBusters program over both the short and long term. This report aims to establish whether the new correspondence format of the GutBusters program is as effective in producing waist loss in men, as the group based program (O'Neill 1993).

This will be achieved by:

a) Comparing the waist loss of those in the correspondence program with those involved in the group based GutBusters program.

b) Examining changes in obesity related behaviours of the participants in the correspondence program, and comparing them to the behaviours of the participants in the group based GutBusters program.

c) Evaluating the six components of the GutBusters correspondence program.
1.2 Variables affecting GutBusters correspondence program.

Because the GutBusters correspondence program relies on individual action, its success may be compromised by a lack of group support to encourage waist loss and by the need for self-discipline to follow the program week by week.

Evaluation of the GutBusters correspondence program will establish whether it is successful in making significant changes in waist loss and obesity related behaviours.

1.3 History of the GutBusters Program.

The GutBusters program was developed to combat the escalating problem of male obesity in Australia. Until this time, there were no generally available weight control programs designed to meet the specific needs of the male population. The program originated from a successful trial in Newcastle, involving employees of the BHP steelworks (1992). This trial was followed by a program at Forster-Tuncurry (June 1992) which was completed by 55 of the 57 participants (Bolton 1994).

GutBusters became a commercial venture in 1993. The GutBusters program operates in Sydney, Newcastle, Wollongong, Adelaide and Melbourne. The program was expanded to include an ‘Advanced GutBusters Program’. This program offers further instruction for six fortights to successful GutBusters participants after their initial six week course.

The success of both these programs initiated the development of the GutBusters correspondence waist loss program. This program is designed for those men who are
unable to attend weekly GutBuster sessions, or are uncomfortable with group sessions. Men enrol in the GutBusters correspondence program at a cost of $195.00. They receive a kit which contains three audio cassettes (6 weekly episodes of instruction), a fat and fibre counter (Stanton 1993), a GutBusters waist loss book (Egger and Stanton 1992), measurement tape, written program guide, reply paid envelopes and access to a GutBusters telephone hot line. The kit enables participants to listen to weekly episodes when it is convenient. The men are encouraged not to weigh themselves, instead the waist and the waist/hip ratio (WHR) are used as a measure of size reduction. The participants aim to loose five percent of their original waist measurement by the completion of the program. The GutBusters program uses information gathered from participants on the pre-questionnaire to make individualised reports on energy balance.

The GutBusters guide explains the use of a four step approach to achieve male waist loss (Egger and Stanton 1992). The components are modifying eating habits, moving more, eating differently and trading off exercise for eating.

1.4 The basis of the GutBusters program

The GutBusters program is not based on any particular theory of behaviour change. It is an eclectic program based on a wide variety of health promotion theories. GutBusters is different to other fat reduction program in the past. It has developed its own theories about fat reduction in the male population. An interview with Gary Egger found that the GutBusters program is based on the belief that men reduce their fat differently to women. In the interview, Egger (1995) pointed out that the GutBusters program
concentrates on fat loss, as opposed to weight reduction. Egger believes that men generally lack knowledge about dietary fat, exercise and alcohol consumption, and that increasing their knowledge in a program such as GutBusters can result in suitable behaviour change to cause healthy amounts of fat reduction.
CHAPTER 2.

Literature Review

2.1 Introduction

Obesity contributes to many serious health problems in today’s society (Lavery and Loewy 1993). While theories of the cause of obesity implicate lifestyle, socioeconomic and genetic factors, the treatment of obesity is unsatisfactory and characterised by high attrition rates from treatment regimens (Brownell 1984). Treatment must use a holistic approach in order to be successful (Levy et al 1986).

Centrally distributed body fat (android pattern) can increase the health risk associated with obesity (Vague 1956). Men are more likely to have android pattern body fat than women (Danforth et al 1991). The GutBusters program aims to increase men’s knowledge about the health risks associated with android body fat (Egger and Stanton 1992).

Measurement of android body fat allows individuals to assess their health risk and change their fat distribution. There are many ways of measuring body fat. The method utilised by the GutBusters waist loss program is the waist/hip ratio (WHR) because it appears to be a good indicator of regional fat distribution (Egger 1995a).
There are many weight loss programs in existence in Australia (Australian Consumers Association 1993). Many of them appear to profit from the high attrition rates associated with failed weight loss attempts. Most of them focus upon the needs of the female population and neglect the specific needs of men. The GutBusters program was designed to address the problems associated with male obesity (Egger and Stanton 1992).

2.2 Obesity a serious health problem.

Obesity is defined as an: *'excessive accumulation of fat in the body; increase in weight beyond that considered desirable with regard to age, height and bone structure'* (Miller and Keane 1983).

Obesity has become one of the major public health issues in the western world. In the United States the economic costs of chronic diseases which can be attributed to obesity were $39.3 billion in 1986 (Lavery et al 1993). In Australia, the economic cost of obesity related disease is 1.5 billion dollars each year (Crowley 1993 cited in Bolton 1994). The National Heart Foundation reported that 60 percent of Australian males and 40 percent of females over the age of forty five years are overweight or obese (Danforth et al 1991).

Obesity is associated with many chronic illnesses such as heart disease, diabetes, respiratory disease, gallstones, orthopaedic disorders, gout and cancer (Gortmaker et al 1990; Danforth et al 1991; Lavery and Loewy 1993).
Robison et al (1993) showed that efforts to induce a moderate weight loss in overweight individuals significantly can reduce health risks and medical problems in obese people. Schotte et al (1990) also found that obese patients with non-insulin-dependent diabetes mellitus (NIDDM) show an improvement in glucose tolerance with weight loss. Research shows that changes in weight correlates with reduced levels of coronary heart disease risk factors (ie: lower blood pressure, lower serum cholesterol concentrations, and improved glucose tolerance tests) (Tuomilehto et al 1987). By reducing the number of overweight/obese people in the community the levels of ill health also will be reduced.

Whilst reducing weight seems a simple solution to the growing numbers of people affected by obesity related disease, one of the major problems associated with obesity is high attrition from weight reduction programs (Pratt 1990). To ensure that a person has recovered from obesity, they must reduce their size to their ideal weight and maintain that weight for a period of five years (Brownell 1984). Whilst recovery may seem in principle to be readily achievable, Brownell (1984) notes that recovery from obesity is less likely than many forms of cancer.

2.3 The cause of obesity.

Obesity/overweight frustrates sufferers and professionals alike. There are many theories about the cause of obesity/overweight. Brownell (1984) describes two theoretical hypothesis for obesity. The fat cell theory hypothesises that nutritional and genetic influences early in life lead to hyperplasia. This theory states that the
number of fat cells stabilise some time in adolescence, and that weight loss and gain are the result of changes in cell size, not the number of cells. The set point theory hypothesises that each individual has an ideal body weight and that the body sends out physical and psychological messages to defend against an alteration of that state.

Genetics is another influential factor affecting a person’s predisposition to be obese/overweight (Danforth et al 1991). People who are genetically at risk of becoming obese/overweight are more likely to be affected by the diseases associated with this condition (Danforth et al 1991). There have been few advances in the treatment of obesity caused by genetics. Recent tests on obese laboratory rats have shown that a defective gene (known as ‘ob’) which controls appetite, can be treated with an injection of the ob protein causing dramatic reductions in weight (Coghlan 1995). Humans have a gene which is almost identical to the ob gene in rats. Coghlan (1995) reports that there should be caution against overoptimism, as it is believed that treating the ob gene alone will have little effect on overweight humans.

Danforth et al (1991) notes that a genetic predisposition to become overweight/obese can be detected at early infancy. Babies who fidget more as an infant tend to be leaner children than those babies that do not (Danforth et al 1991). Danforth et al (1991) also found that there is a familial tendency to be a ‘fat burner’, or a ‘carbohydrate burner’. ‘Carbohydrate burners’ gain weight more easily than people who ‘burn fat, as they retain their fat for times of famine’
(Danforth et al 1991). Thus they are more likely to become overweight than those people who are 'fat burners'.

Whilst there have been limited advances in the study of genetically associated obesity, lifestyle factors which contribute to obesity are better understood (Emery et al 1993). There are several lifestyle factors which have caused an increase in the number of obese people during the twentieth century (Gortmaker et al 1990). In the U.S.A and Australia, technology has led to an increase in the amount of leisure time. Many people spend this time performing sedentary activities such as watching television (Gortmaker et al 1990, Egger and Stanton 1992). A survey of adults at Harvard School of Public Health found an association between television and obesity. Of those who watch one hour of television a day or less, 4.5 percent were obese. Of those who watched three or more hours of television a day, 19.2 percent were obese (Gortmaker et al 1990).

For many people in our society, alcohol use is a common leisure activity (Egger and Stanton 1992). Boyle et al (1993) found a correlation between overweight/obesity and alcohol consumption in men. The fact that many alcoholic drinks are high in kilojoules contributes to the potential for obesity (Egger and Stanton 1992).

Advances in technology at work has resulted in machines replacing humans in many manual areas of the work place (Egger and Stanton 1992). As a result, it has led to a decrease in the energy required to perform work activities. More sedentary
work results in an overall reduction in daily energy expenditure. In many cases, the reduction in energy expenditure is not compensated for, resulting in increasing numbers of overweight/obese people (Egger and Mowbray 1993).

A wide variety of food and cooking methods also may be cause for the growing numbers of obese in our community. Droen et al (1988) suggested that an increase in the amount of fat in our diet contributes to the number of overweight people. People in the U.S.A eat 31 percent more fat in their diet today than in 1910.

The socioeconomic status of an individual may be another contributing factor to obesity/overweight (Lavery and Loewy 1993). Socioeconomic gradients were found to be strongly associated with individuals' waist hip ratios (WHR) and body mass index (BMI). Men with higher education and/or in professional occupations had a lower mean WHR than men in any other group (Boyle et al 1993). Boyle et al (1993) also found that men working as plant and machine operators, and drivers, had a significantly higher WHR. This was supported by Egger (1995a) who states that 75 percent of men in lower socioeconomic groups have been shown to be abdominally obese.

Higher socioeconomic status was found to correlate with success in treating obesity/overweight (Lando et al 1993). In a work site study, Lando et al (1993) found that men with higher job status were more likely to participate in weight reduction programs than men with a lower job status.
Knowledge about diet and disease is associated with socioeconomic status. Crawford and Baghurst (1990) found a correlation between lower occupational status and lack of knowledge about diet and disease. Lavery and Loewy (1993) note that executives are more likely to lose weight than other employees or the unemployed. Lack of knowledge could contribute to an individual’s ability to lose weight.

2.4 Dietary fat.

Dietary fat is very energy dense. There are a number of reasons why dietary fat is an important determinant of obesity: it contains twice the energy per gram as starch; it is a poorer appetite suppressant than carbohydrate or protein, thus it is much easier to over consume dietary fat than foods rich in carbohydrate or protein; and it is metabolised with 99 percent efficiency, whilst carbohydrates are metabolised with 77 percent efficiency, thus dietary fat is metabolised more effectively than carbohydrate (Anon 1995).

The amount of carbohydrate which can be stored in the body (as glycogen) is relatively small. The remainder must be converted to fat for the purpose of storage. The converting of carbohydrates to fat uses up more energy than storing fat already in this state. Because dietary fat can be consumed in larger amounts and contains twice the amount of calories as carbohydrates or protein, it is much easier to gain weight from its consumption (Anon 1995).
Danforth and colleagues conducted a study of prisoners who were placed on either a high fat or high carbohydrate diet. Those on the high fat diet tended to gain weight more easily than those on the low fat diet (Danforth et al 1991). Thus Danforth et al (1991) recommend a high carbohydrate, low fat diet. It also was recommended that adults be educated to identify sources of fat in their diet and to be equipped with a repertoire of alternative foods. They noted that adults should be retrained to compensate for eating binges. Similar results were found in studies by Tucker and Kano (1992). They also found that obese people often choose a diet higher in fat than lean people.

A study of the dietary fat of 155 middle aged men found a positive correlation between total fat, saturated fatty acids, monounsaturated fatty acids and body fatness. The same study found a negative correlation between body fat and total carbohydrate, fibre and plant protein in the diet (Droen et al 1988). There was a correlation between the number of meals consumed, and the amount of body fat. Excessive weight was more common in those that ate three meals or less each day than those who ate more than three meals each day. Interestingly, this study found a nonsignificant relationship between total calorie intake and obesity (Droen et al 1988).

2.5 Dietary fat balance.

The fat balance equation proposed by Swinburn and Ravussin (1993) assists the understanding of fat balance in the human body and acts as an alternative to the
energy balance equation (ie energy intake = energy expenditure). Glycogen and protein stores are closely controlled by the body, an increase in their levels stimulates oxidation rates proportionally. Fat stores are not controlled in the same manner. Brownell (1984) notes that the body creates biological pressure on fat cells to maintain their energy supply. An increase in the amount of fat consumed can lead to a positive fat balance which can become chronic, and result in obesity (Tremblay 1989; Swinburn and Ravussin 1993). Furthermore, excess energy intake causes accumulation of energy which is mostly stored as fat, and eventually leads to the individual being overweight or obese (Warwick 1989).

2.6 Distribution of body fat

Physiological evidence shows a causal relationship between obesity/overweight and risk factors for ill health. Vague (1956) documented the noticeable differences in body fat deposits. He suggested that the amount of adiposity was not as relevant to disease as the location of adiposity. It is hypothesised that the location of body fat is hormonal related, varying with sex hormones or their related binding globulins (Emery et al 1993).

Android fat distribution is associated with increased morbidity and mortality (Bouchard et al 1990). Android fat is located anteriorly on the trunkal part of the body and is found most commonly in men (Danforth et al 1991). Android adiposity is sometimes more commonly known as apple shaped (Danforth et al 1991).
Gynoid fat is located in the lower portions of the body and is found mostly in pre-menopausal women (Bouchard et al 1990). Gynoid fat is sometimes more commonly known as pear shaped (Danforth et al 1991). Gynoid fat distribution appears to have little effect upon morbidity or mortality, unless it significantly increases the overall amount of body fat.

The shape of most obese men makes it more imperative that they be targeted to reduce their body fat. Android (trunkal) adiposity is most commonly found in men (42 percent) and post menopausal women (24 percent) (Egger 1995a). This region of fat storage creates the greatest amount of concern for health professionals due to the risk of serious illness. Conversely, gynoid adiposity is not found to be associated with serious illness (Bouchard et al 1990), yet most weight loss techniques are aimed at the female population.

Android adiposity is more responsive to changes in energy balance than gynoid adiposity, as adipocytes in these regions are more metabolically active (Tremblay et al 1988; Danforth et al 1991). Android adiposity is associated with several lifestyle factors (smoking, exercise, diet and alcohol consumption), making them more amenable to change than gynoid adiposity (Emery et al 1993). Furthermore, Lavery and Loewy (1993) found that of 1,460 subjects (of whom 25 percent were male) male participants were more likely to maintain their weight loss than the female participants.
2.7 Measuring Body fat.

There are three types of abdominal fat, they are: intra-abdominal, visceral (behind the abdominal muscles) and subcutaneous (between the abdominal muscles and the skin) (Emery et al 1993). The fat most commonly associated with pathology is the intra-abdominal fat (Emery et al 1993).

Skinfold measurements only measure subcutaneous fat at various sites on the body. A derived formula is used to convert it to a percentage of total body fat. It provides an estimate of intra-abdominal fat. Skinfold measure is a non-invasive and inexpensive form of body fat measure (Emery et al 1993).

There are various methods of measuring abdominal fat. Bioelectrical impedance analysis (BIA) is a computerised method of measuring total body fat by using the resistance of electrical impulses (Bouchard et al 1990). CT scans (multiscan computed tomography) or magnetic resonance imagery (MRI) can accurately measure visceral and subcutaneous fat (Bouchard et al 1990). Trunkcal and abdominal subcutaneous fat can be measured using skinfold measurements, circumference measurement tape or ultrasound (Bouchard et al 1990). Each measurement device has advantages and disadvantages.
CT scans are the most effective means of measuring fat distribution. They measure visceral and subcutaneous fat. However this method of body fat measure is costly, and the equipment is not portable (Emery et al 1993).

One of the most popular methods of ranking body mass is the Body Mass Index (BMI). The body mass index is the individual’s weight in kilograms divided by their height in metres squared. A BMI of 25 (men) or 24 (women) or greater is considered to be overweight. People with a BMI greater than 30 are considered to be obese. BMI does not take into account lean body mass, or certain body shapes (ie: mesomorph somatotype, or elite athletes). Thus not all people in the BMI range of 25-30 are over fat (Danforth et al 1991; Egger 1992).

The waist, hip ratio (WHR) is another method of measuring abdominal obesity. One advantage of the WHR is that it is said to be a good indicator of regional fat distribution (Egger 1992). The WHR measures abdominal obesity, which is associated with coronary heart disease, diabetes, hypercholesterolaemia and heart disease (Lapidus et al 1984; Boyle et al 1993; Egger 1995a). WHR measures are easy to take, non-invasive, inexpensive, and require minimal user training (Egger 1992; Emery et al 1993). The WHR is determined by dividing an individual’s waist measurement (at the umbilicus) by their hip measurement (at the widest circumference over the buttocks). Ratios over 0.9 in males and 0.8 in females are considered to be in the high risk group (Egger and Stanton 1992). WHR measurements are more strongly correlated with health risk than the skinfold measurement device (Emery et al 1993).
Unfortunately the WHR has several disadvantages. The WHR measurement has not been standardised. Wadden et al (1988) report that there are several variations on the best locations for WHR measurements, making it difficult to compare between studies. However, Emery et al (1993) note that changes in the WHR may produce little or no change in the circumference ratios depending upon the region of weight loss. van der Kooy et al (1993) conducted a study to establish the effectiveness of the WHR for body fat measurement, by comparing it to magnetic resonance imaging. They found that changes in the WHR were not absolutely related to the changes in visceral fat. Another disadvantage of the WHR, which is pertinent to this study, is that several studies show conflicting results over the effectiveness of self reported waist measurements (Lavery et al 1993).

2.8 Energy Expenditure

There are three components of energy expenditure. The first is the basal metabolic rate (BMR), which is the metabolic cost to the body at rest. The thermic effect of exercise, which is the energy used to operate the voluntary muscles of the body is a second component of energy expenditure and thirdly is the thermic effect of food, which is the energy used to digest food (Danforth et al 1991). Individuals that are more active have a higher BMR than non active individuals. The BMR can be effected with activity by as much as 5-10 percent, which is significant as the BMR accounts for 70 percent of the body's daily energy expenditure (Danforth et al 1991).
2.9 Exercise

A positive energy balance results when more food is consumed than is needed to perform daily tasks. This is a common problem in modern times in western countries due to a more sedentary lifestyle. Droen et al (1988) found that elevated levels of physical activity correlated with altered levels of adiposity and dietary intake which normally prevail in a sedentary state. Thus to compensate for decreased levels of activity in daily tasks, energy expenditure can be increased with exercise.

Exercise has additional benefits for people trying to maintain energy balance. Exercise prevents excessive loss of lean body mass during weight control programs (Lavery et al 1993). Exercise has the added advantage that it often decreases the appetite, reduces the decline in Basal Metabolic Rate, adds to the individual’s feeling of well being and may be effective in reducing trunkal adiposity (Despres 1987). Lavery et al (1993) found an association between people who increased their exercise regime after joining a weight control program, and weight loss after a two year period.

Exercise is recommended for people who are trying to reduce their body fat. Unfortunately obese people are often reluctant to exercise (Brownell 1984). Adherence to exercise programs by the obese is small and usually has a drop out rate as high as 50 percent (Brownell 1984). Brownell (1984) found that a key to
encouraging exercise in the obese is to establish a form of exercise which suits their individual tastes. Egger and Stanton (1992) recommended increasing incidental movements over the day which would in turn increase the amount of energy used. The GutBusters program recommends that individuals chose their preferred form of exercise to assist in fat reduction.

Behaviour therapy has been shown to increase the numbers of obese people who participated in an exercise regimen. Hart et al (1990) conducted a study of 75 participants involved in a behaviour therapy weight loss program. The program involved 15 intensive weeks, followed by 12 months of weekly support groups. They found that behavioural modification therapy was successful in increasing those who normally exercised from one individual pre-program to twenty at the end of the one year period.

2.10 Obesity related behaviours.

Obesity is a multifactorial health problem, with genetic, environmental and behavioural influences upon its development (Danforth et al 1991). The reduction of risk factors has been shown to have an impact upon the health risks associated with obesity (Lavery et al 1993). Some risk factors cannot be changed (ie genetics, age, sex of the individual), but people with these risk factors can be targeted with greater effort in weight control programs, and their predisposition recognised so as to reduce feelings of guilt, and set more realistic goals (Danforth et al 1991 ). Other behavioural factors can be altered to reduce weight and hence the risk
factors associated with obesity/overweight (Danforth et al 1991). Behaviours which can be modified include diet, exercise, alcohol consumption and cigarette smoking (Emery et al 1993). These factors are the focus of effective weight control programs. Weight control programs based on behaviour modification, diet and exercise are more effective than those programs which treat people medically or by diet alone (Lavery et al 1993).

2.11 Behaviour change therapy.

Hart et al (1990) found that behaviour modification was an effective method of weight reduction. They suggested that successful programs should include lectures, personal counselling and continuing follow-up. Family support was found to increase the success of weight loss maintenance. Likewise, Parnham (1993) found that social support correlated with weight loss maintenance.

Bjorvell and Rossner (1985) conducted a four year program to treat severely obese people. They found that the rate of drop out in a behaviour modification program which incorporates exercise and nutritional advice was generally lower than that usually reported. To have lasting effects upon weight losses, Bjorvell and Rossner found that the key to success in this program was active support and encouragement.

Programs utilising behaviour modification techniques have a low drop out rate, can be taught easily, and have been shown to produce significant weight loss in
individuals over the short term (Levy et al 1993). Furthermore, such techniques are low cost and can be utilised in community projects. Involving family in behaviour treatment has been found to enhance the success of weight control programs (Hart et al 1990).

It is important to consider the individual life circumstances of participants on weight control programs (Wood 1990). Different family situations, environments and lifestyles create a mosaic of individual needs. Certain characteristics are associated with greater program success. People who are married are often more successful at weight loss programs than unmarried people (Lavery et al 1993). Men have more success in weight loss programs where they participate in group sessions, while women have greater success with individualised counselling. Patients with obesity and more than one other health problem were more likely to succeed in a weight control program than those who did not have extra health problems (Wood 1990).

2.12 Social pressure and obesity.

Many obese people are discriminated against by their peers (Frankle 1985). Brownell (1984) notes that discrimination against the obese in the U.S.A may affect their college admission or employment opportunities. In Australia, there is a great social pressure to stay thin (Egger and Stanton 1992), and this correlates with the large numbers of commercial weight loss programs (Australian Consumer Association 1993). The social pressure felt by obese people may result in low individual self esteem and body image. Brownell (1984) found that obese people
often are preoccupied with weight loss, and detest their bodies. Levy et al (1986) felt that weight control efforts needed to consider more than the physical conditions suffered by obese people.

2.13 The weight loss industry.

An industry has developed out of weight loss programs which profits from attrition rates as high as 83 percent (Pratt 1990). Most weight loss programs focus on the female population and neglect the needs of men, despite the higher rates of overweight and obesity in the male population. It is widely believed that many commercial weight loss programs play upon the thin images presented in advertising and fashion magazines (Australian Consumers Association 1993), obviously appealing to the female audience. Egger and Mowbray (1993) found that women were motivated to lose weight for aesthetic reasons, while men were more concerned about feeling better.

Many weight control programs may be considered ineffective, due to the high rate of attrition (Pratt 1990). Low recovery rates from traditional commercial weight loss programs contribute to the frustration felt by professionals and clients in search of effective weight control measures (Bartl et al 1991).
2.14 Men as a target group for obesity

As a member of the World Health Organisation (WHO), Australia is aligned with the Ottawa Charter for Health Promotion (WHO 1986). One of the major goals of the WHO is to reduce the number of inequalities in the distribution of health resources (Fletcher 1993). In 1988 the Health For All Australians report identified three major areas of inequality in the Australian health system, Aboriginality, socioeconomic status and gender. While the report did not offer specific support for the male population of Australia, it did recognise the absence of goals, targets and strategies for men's health. In 1993, the 'Ottawa Charter For Blokes' project was released, to develop a model of health promotion for Australian men (Fletcher 1993).

Of the existing weight control programs, 95 to 99 percent are designed for women (Boyle et al 1993). Men were involved in only two percent of community based weight loss programs (Levy et al 1986). These inequalities may have occurred because to date women generally show a greater interest in a healthy diet and in making dietary changes than men (McConaghy 1989).

Schäfer and Schäfer (1989) report that in most marriages and de facto relationships, women are the key performers in food-related household tasks. Lack of male
involvement in food selection and preparation may indicate a similar lack of nutritional knowledge. They recommended targeting the male population with educational efforts to broaden their food-related interests to increase behavioural change. This idea is a key factor in producing lifestyle changes in the GutBusters program.

2.15 Male weight control

In a national survey, 29 percent of men noted lack of will power as the main cause of failed weight loss attempts, 14 percent blamed lack of good information or advice and six percent felt that there was not enough time to buy healthy foods. Many of those surveyed did not believe that fat, sodium and sugar can contribute to ill health, yet most of the people felt that they had the necessary knowledge to make a healthy dietary choice. At the time of the survey, only a minority were making dietary changes to reduce the risk of disease (Crawford and Baghurst 1990). This survey clearly indicates a need for improved fat loss information for the male population. To date, there has been little research into obese Australian men, how they perceive their size, and whether they are likely to undertake health care practices to reduce their body fat (Burns et al 1991).

2.16 Correspondence weight loss program.

There are several reasons for utilising correspondence as an alternative format for weight control: correspondence programs are less costly than many group and clinic-based alternatives; they can be used to reach a larger audience when the
prevalence of health behaviours such as obesity far exceeds the capacity of the existing health system; and they are more attractive to people who do not usually participate in group and clinic-based interventions. People with limited leisure time, or complicated schedules (ie: shift work) may not be able to participate in programs at fixed times. Many people may not need intensive training to make the necessary changes to health behaviour, thus the correspondence form of weight loss may be a suitable alternative. (Jeffery et al 1982; Schmid et al 1989).

The correspondence programs were found to be more suited to a particular audience. People who enrolled in correspondence courses were older, better educated and more often male (Schmid et al 1989). This audience is somewhat different to the traditional audience found in group based weight reduction programs (Schmid et al 1989). Another characteristic of the correspondence programs, was that mailing programs which provided more frequent mail contact with the client were more effective than those that did not (Jeffery et al 1990). Furthermore, participants in the more intensive programs achieved greater weight losses than the less intensive courses (Jeffery et al 1990).

There were several problems associated with the correspondence weight loss programs. The correspondence programs were affected by high rates of attrition (Jeffery et al 1982). One of the possible reasons for this may have been the lack of support in correspondence programs, which is thought to exist in personal contact programs. Another problem encountered by Jeffery et al (1990) was the numbers of people enrolling in the correspondence program. The numbers were only
moderately encouraging, with 5.5 percent of the total households responding to posted program material. Furthermore, participant response rates to the final evaluation were poor (31 percent of the total population surveyed).

2.17 Program information.

The GutBusters correspondence program utilises three questionnaires to assist when evaluating participant lifestyle changes. The program questionnaires include; the short fat questionnaire, the exercise questionnaire, and the alcohol questionnaire.

2.17.1 The Short Fat Questionnaire.

The Short Fat Questionnaire is a self administered survey developed by Dobson et al (1993) which can be completed in approximately three minutes (Hawe et al 1990). The questionnaire is composed of closed-ended multiple choice questions. It aims to allow subjects to identify areas of their diets which may need improving through reduced fat intake. It was strongly associated with devices used to measure the attitudes, knowledge and behaviour of people following a low fat diet.
The Short Fat Questionnaire is used in the 'GutBuster' waist loss program to assess the dietary fat intake of its participants. This questionnaire is easy to use, and has been trialed on an Australian population (Dobson et al 1993). It was found to have a reasonable level of validity ($r=0.55$) and high levels of reproduceability ($r=0.85$). It can be used to broadly rank participants according to their fat consumption (Dobson et al 1993). Kinlay et al (1991) utilised a similar questionnaire to allow short and inexpensive analysis of dietary fat intake in the community. The short fat questionnaire was successfully utilised by Bolton and O'Neill in previous 'GutBuster' research (O'Neill 1993; Bolton 1994). This questionnaire will assist in establishing dietary change over the duration of the GutBusters correspondence program.

2.17.2 Exercise questionnaire

The GutBusters program uses an exercise questionnaire to monitor the activity levels of the participants. The questionnaire is used to evaluate pre-program and post-program behavioural change in exercise. It is an indicator of change in exercise intensity, frequency and duration. The same questionnaire was used by O'Neill and Bolton in similar studies of the GutBusters program (O'Neill 1993; Bolton 1994).

Physical activity questionnaires are difficult to validate because of a lack of adequate criterion to measure (Washburn et al 1986). Whilst there are limitations caused by such inadequacies, lack of alternatives makes the exercise questionnaire both practical and economical for the use of data collection in this regard.
2.17.3 Alcohol consumption.

Boyle et al (1993) analysed the data collected in the National Heart Foundations Risk Factor Prevalence Study to establish normal ranges for WHR, high alcohol consumption was positively correlated with high WHR and BMI. Whilst the GutBusters program does not advocate the elimination of all alcohol from the diet, it encourages a reduction in the amount of alcohol consumed. The GutBusters program, and two previous studies conducted by O'Neill and Bolton have successfully utilised a questionnaire, similar to the dietary fat questionnaire, to measure behavioural change in alcohol consumption (Egger and Stanton 1992; O'Neill 1993; Bolton 1994). This questionnaire is carefully designed to allow respondents to feel comfortable about answering questions about their alcohol consumption, which may be a sensitive issue. All questions are closed-ended and multiple choice (Hawe et al 1990).

2.18 Program methods

Data collection methods vary according to the type of data which is being collected. There are several recommended methods of data collection. They include self completed questionnaires which can be mailed to participants, telephoning the participants and face to face interview with the participants (Hawe et al 1990).
Descriptive information can be easily collected on questionnaires (Hawe et al 1990). Questionnaires use a structured approach to data collection. A structured approach to questioning has the disadvantage of limiting the opportunity for participants to respond, however, it ensures that participants consider the same issues, thus making it easier to summarise and compare results (Hawe et al 1990). When constructing a questionnaire, there are several issues to consider. Questionnaires should be clear, specific, and sensitive questions should be carefully worded (Hawe et al 1990). Hawe (1990) notes that questionnaires should be attractive and well laid out, as they are more likely to be completed.

Questionnaires are ideal for correspondence programs (Hawe et al 1990). They are: easily posted, inexpensive, reach a wide audience, are standardised, and cause less embarassment when asking sensitive questions. However correspondence programs have the disadvantage of a low participant response rate (Worsley 1989). Furthermore, there is some bias associated with questionnaire response rates, as a particular type of person may refuse to participate (Hawe et al 1990).
3. **METHODOLOGY.**

There were 45 participants involved in the study. Each participant took waist and hip measurements to allow for fat losses to be evaluated. They completed three short pre and post program questionnaires so that their exercise, alcohol and dietary habits could be evaluated. The data was compared to the group based GutBusters program (O’Neill 1993).

3.1 The sample

The sample was derived from consenting volunteers involved in the ‘GutBusters by mail’ program between August 1994 and July 1995. All men were accepted to the program, unless medical instruction advised against it. Men were recruited by newspaper, radio, television, word of mouth, as a gift and work place programs.

Forty five men were involved in the study. There were 88 men who were invited to join the study from August of 1994 to August of 1995.

3.2 Measurements

Participants took waist measurements each week of the six week program and hip measurements on week one and week six of the program. These measurements were used to establish a waist/hip ratio. Thus, participant fat losses to be evaluated.
3.3 Questionnaires.

The questionnaires in this study are based on the standard questionnaire used by the group based GutBusters program and in the study by O’Neill (1993). The pre-evaluation questionnaire (Refer Appendix 1) includes additional questions about drink intake, marital and occupational status. The post-evaluation questionnaire (Refer Appendix 2) has additional questions addressing participant satisfaction with the correspondence format.

3.3.1 Short fat questionnaire

Participants were asked to complete a pre-program and post-program evaluation of dietary fat intake. This involved a 17 item dietary fat behaviour questionnaire designed by Dobson et al (1993). Scores could range from 0-63, with 0 indicating a low fat diet, and 63 a high fat diet. (Refer Appendix 6).

3.3.2 Alcohol questionnaire

Alcohol use was assessed using a two item questionnaire, which measured the frequency and volume of alcohol consumption. On a four point scale, 0 indicated no alcohol consumed, and 4 indicated high levels of alcohol consumption (Risk Factor Prevalence Study Management Committee, 1990). (Refer Appendix 7).
3.3.3 Exercise questionnaire

Exercise, was recorded on a three item questionnaire which measures frequency, intensity and duration of exercise. These were on a four point scale with 1 indicating minimal levels of exercise, and 4 indicating high levels of exercise. (Refer Appendix 8).

3.4 Calculating questionnaire scores

To establish scores for the Short Fat Questionnaire, individual item scores were totalled to give a range between zero and 63. The volume and frequency of alcohol consumption were given individual item scores from zero to four. Exercise frequency and duration were given individual item scores from one to four, whilst intensity was given an individual item score from one to three. The waist/hip ratio was determined by dividing individual waist measurements by their hip measurements. All data were calculated manually, then entered for statistical analysis into the Microsoft Excel program (Microsoft Corp 1985).

3.5 Baseline data.

Baseline data from the group based GutBusters report (O’Neill 1993) was used for a comparison. The data included anthropometric measurements and behaviour change measurements.
3.6 Ethical considerations.

The Wollongong University Human Experimentation Ethics Committee (He 95/53) and GutBusters Pty Ltd gave their permission for this study to be conducted. Each participant received a letter of introduction to the study (Refer Appendix 3), its objectives and a consent form (Refer Appendix 4). Participants were only included in the study if written consent was obtained. Participants were able to withdraw from the study at any time, without need of a reason. Some participants were given an added incentive of a GutBusters high energy guide (Egger and Stanton 1995) to participate in the program. This was necessary to increase the sample size near the completion of the study.

3.7 The GutBusters program guide

The evaluation packages were made up as follows:

Week 1: A GutBusters by mail kit, which included 3 audio cassettes, fat and fibre counter, handouts, GutBusters book, tape measure, reply paid envelopes addressed to GutBusters, pre-evaluation questionnaire (Refer Appendix 1)

Week 2-5: Individual waist measures forms to be returned to GutBusters weekly

Week 6: A letter of introduction from the researcher, describing the purpose of the study (Refer Appendix 3), a letter to seek permission for the use of individual’s data in the study (Refer Appendix 4), a post-evaluation questionnaire (Refer Appendix 2), final waist and hip measure form to be returned with the above mentioned data in the envelope provided.
3.8 Initial Plan for data collection

The plan for data collection was as follows: Men involved in the GutBusters by mail program during May, June and July of 1995, would be invited to participate in this study. At the beginning of the program they would receive the standard GutBusters pre-evaluation questionnaire with the GutBusters kit. At the completion of the program, the GutBusters office would send the participants the letter of introduction (Refer Appendix 3), consent form (Refer Appendix 4) and post-evaluation questionnaire (Refer Appendix 2). It was planned that any participants who had not responded ten days after being sent the post-evaluation questionnaire would be contacted by telephone. Data collection would be complete on the 31st of July 1995.

3.9 Actual data collection process

Various factors required changes to be made to the schedule. The actual sequence of events were as follows: Men involved in the GutBusters by mail program during May, June and July of 1995 were invited to participate in the study. They received a pre-evaluation questionnaire with their GutBusters by mail kit when they first joined the program. Six weeks later, at the completion of the program, GutBusters sent the letter of introduction (Refer Appendix 3), consent form (Refer Appendix 4) and post-evaluation questionnaire (Refer Appendix 2) to the participants. Ten days later, those men who had not responded were telephoned to encourage them to return their forms. This effort marginally increased the sample size. At the end of June 1995, it was clear
that the number of respondents was too small for an appropriate sample size. Further efforts were made to increase the sample size by inviting all respondents of the GutBusters correspondence program (since it began in August 1994) to participate in the study. These men had already completed the course and the GutBusters post-evaluation questionnaire. GutBusters sent them the letter of explanation, consent, and the additional questions (Appendix 5) not in the standard GutBusters post-evaluation questionnaire. Ten days after they received the invitation, each man was telephoned to encourage them to return their forms. At this stage the sample size was approximately 30 men. After consultation with the study supervisors and the GutBusters staff, it was decided that non-respondents would be offered an incentive for returning their forms by August 1995. The incentive was a GutBusters high energy guide (Egger and Stanton 1995). This allowed the participants seven to ten days to return their forms. Several men responded, and all data collection was finalised on the 31st of August 1995.

3.10 GutBusters (North Sydney) involvement in data collection

GutBusters (North Sydney) printed the letter of introduction (Refer Appendix 3) and consent form (Refer Appendix 4) on their own letterhead. The pre-evaluation questionnaire was identical to the regular pre-evaluation except for an additional front page for personal details (to allow it to be detached for reasons of confidentiality). GutBusters incorporated the additional questions into their post-evaluation questionnaire and posted the kits and post-evaluation questionnaire in the usual manner to the participants. GutBusters sent additional post-evaluation questionnaires
(approximately ten) to those participants who were offered an incentive by telephone, but had lost their first post-evaluation questionnaire. GutBusters posted the GutBusters high energy guide (Egger and Stanton 1995) to those participants who were made an offer and returned the forms by August.
4. RESULTS

4.1 Sample size and significance level

The minimum sample size was calculated in relation to the mean to a specified level of precision and accuracy (Refer Appendix 9, Table 6). The sample size needed for a 95 percent confidence interval (estimate +/- one centimetre) (Harrison and Tamaschke 1984). It was calculated that the minimum sample size required to accurately measure waist change was 26.37 men, for hip change it was 29.9 men, and for change in WHR it was 34.5 men. Furthermore, according to the Central Limit Theorem (Harrison and Tamaschke 1984), a sample size greater than 20 men is sufficient. The sample sizes in this study ranged between 41 and 45 men, exceeding the limits established above. A significance level of 2.5 percent was chosen as being more stringent than a 5 percent level of significance.

4.2 Participants in the sample

The group based GutBusters study (O’Neill 1993), had a sample size of 260 men. There were a further 249 participants who were not included in his study. The sample in the correspondence program was 45 participants. Forty three participants did not consent to be part of the study.

The average age of the men in the group based program was 47 years with a range of 20 to 73 years. The average age of those in the correspondence program was 51 years with
a range of 28 to 77 years. The pooled two sample t test was used to test whether the mean changes of the two independent populations were equal (Refer Appendix 9, Table 4a- 4e). The null hypothesis is that the mean change of the group based program was equal to the correspondence mean versus the alternative hypothesis that the mean change of the group based program was greater than the correspondence mean. At the conclusion of the tests, it was found that the null hypothesis should not be rejected in all cases, and that there was no significant difference between the means of the two independent samples.

4.3 Attendance.

Fifty seven percent of those in the group based program attended all six sessions of the GutBusters program, with increasing numbers of dropouts over the program. The correspondence course had 98 percent of the participants who reported that they had completed the program by listening to all of the lectures on the GutBusters tapes.

4.4 Waist and hip circumference, and WHR.

The group based GutBusters program showed significant differences between the waist and hip measurements, and the WHR at the beginning and the end of the program. The waist measurements dropped from 118.52 (SEM 0.647) to 110.59 (SEM 0.625) resulting in a percentage change of - 6.68. The mean hip measurements changed from 116.47 (SEM 0.549) pre test to 112.86 (SEM 0.529) post test, resulting in a percentage change of -3.06. The mean WHR changed from 1.0175 (SEM 0.0026) to 0.9795 (SEM
0.0026) with a percentage change of -3.7 (O’Neill 1993). Comparatively, the GutBusters correspondence program found that the mean waist measurements changed from 117.2 (SEM 1.875) pre test to 109.93 (SEM 1.892) post test (t= 18.6, d.f.=44, p < 0.001) (Refer Figure 4.4A), resulting in a percentage change of -6.20. The mean hip measurements changed from 111.86 pre test (SEM 1.440) to 109.01 (SEM 1.4527) post test (t= 6.46, d.f.=40, p < 0.001) (Refer Figure 4.4B), resulting in a percentage change of -2.55. The mean WHR changed from 1.05 (SEM 0.006) pre test to 1.01 (SEM 0.007) post test (t= 8.88, d.f.=40, p < 0.001) (Refer Figure 4.4C), resulting in a percentage change of -3.35.

Figure 4.4A  Mean waist circumference
To establish whether the GutBusters correspondence program had an effect upon the waist, hip and WHR, t tests were conducted using a hypothesised mean difference of zero. Histograms were produced for waist, hip and WHR confirming that a normal distribution existed (Refer Figures 4.4D, 4.4E, 4.4F). The result of these tests confirmed a significant difference between pre and post measurements and that these changes were not due to chance (Appendix 9).
Figure 4.4D  Waist Reduction Histogram - Correspondence program

Figure 4.4E  Hip Reduction Histogram - Correspondence program
The pooled two sample t test was used to determine whether there was a significant difference between the two studies change in waist, hip and WHR (Refer Appendix 9, Tables 4A, 4B, 4C, 4D and 4E). The null hypothesis was that the change of the group based program was equal to the correspondence change and the alternative hypothesis was that the change in the group based program was greater than the correspondence change. At the conclusion of the test, it was determined that the null hypothesis should not be rejected in each case.

### Table 4.4 Pre and post waist, hip and WHR measurements - Correspondence program

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Pre-program</th>
<th>Post-program</th>
<th>Average Change</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SEM</td>
<td>Mean</td>
<td>SEM</td>
</tr>
<tr>
<td>Waist (cm)</td>
<td>117.20</td>
<td>1.88</td>
<td>109.93</td>
<td>1.89</td>
</tr>
<tr>
<td>Hip (cm)</td>
<td>111.86</td>
<td>1.44</td>
<td>109.01</td>
<td>1.45</td>
</tr>
<tr>
<td>WHR</td>
<td>1.046</td>
<td>0.006</td>
<td>1.011</td>
<td>0.007</td>
</tr>
</tbody>
</table>
4.5 Waist reduction goal

Of men who completed the group based GutBusters course, 72 percent of the participants decreased their waist size by five percent. Only five men did not experience a decrease in waist size. Ten percent of the men did not achieve a reduction in their WHR, which may indicate an equal reduction in waist and hip circumference. The GutBusters correspondence program had 73 percent of the participants reduce their waist by five percent. All of the participants experienced a decrease in waist size. Only 2 percent of the men did not experience a reduction in their WHR.

4.6 Behaviour change in dietary fat intake.

The group based GutBusters program found an decrease in the mean score for fat intake (indicated by the short fat questionnaire) of 54 percent (O'Neill 1993). The correspondence program found a decrease in the mean score for fat intake of 58 percent (Refer Figures 4.6A and 4.6B). As the distribution of the data was normal, a t test was conducted to determine whether the changes between pre and post fat consumption were significant. The result indicated that the change was significant (t= 13.39,d.f.=44, p < 0.001) (Refer Appendix 9).
4.7 Components of exercise habits.

In the group based GutBusters program, the amount of exercise performed by the participants more than doubled over the duration of their course (O’Neill 1993). In the correspondence program, 67 percent of the participants increased the amount of exercise performed between their pre and post evaluation. In addition, 22 percent of the participants were already performing the highest level of exercise on the scale pre and
post test, thus no change registered. Fifty eight percent of the participants increased the amount of time they spent exercising between their pre and post evaluation. In addition, 33 percent of the participants were spending the greatest amount of time exercising both at pre and post test, thus no change registered. Forty nine percent of the participants increased the intensity of their exercise over the duration of the course (Refer to Figures 4.7A, 4.7B and 4.7C). Due to lack of statistical data in the group based study, the change in participant exercise habits could not be compared with the correspondence program.

Table 4.7A  Exercise frequency - Correspondence program
The Wilcoxon signed rank test (Harrison and Tamaschke 1984) (Refer Appendix 9, Table 5) indicates that the changes in exercise behaviours in the correspondence program were statistically significant. (For exercise frequency: t=14; for duration: t=24; and for intensity: t=24).
4.8 Components of alcohol consumption

The change in participant alcohol consumption between the group based program and the correspondence program could not be compared due to a change in the scaling system subsequent to the commencement of the group based course began.

In the correspondence program, the frequency with which alcohol was consumed by individuals decreased by 42 percent (Refer Figure 4.8A). The amount of alcohol consumed also decreased, by 44 percent (Refer Figure 4.8B). The Wilcoxon signed rank test indicated that the changes in participant alcohol behaviour were statistically significant. (For alcohol volume: $t=24$; for frequency: $t=14$).

Figure 4.8A Alcohol frequency - Correspondence program
4.9 Participant reasons for using the correspondence format

Thirty eight percent of men in the correspondence program would have preferred to be part of a group based program. There were several reasons why the participants chose the correspondence program over the group based program, they include: work commitments, which made a group based program unsuitable (ie: shift work on Figure 4.9A); living in a distant location with a lack of suitable facilities (ie: geography on Figure 4.9A); they preferred to reduce their waist on their own (ie: self on Figure 4.9A); travel in their work prevented them from attending weekly meetings (ie: travel on Figure 4.9A) and finally, the correspondence program was given to them as a gift (ie: gift on Figure 4.9A).
Figure 4.9A Reasons for joining GutBusters correspondence program

- Geography: 39%
- Self: 31%
- Shift Work: 2%
- Travel: 13%
- Gift: 4%
- Other: 11%
4.10 Participant assessment of audio cassettes

Forty four men listened to all the tapes, 98 percent of the total. Of these men, 51 percent listened to the tapes once only, while 49 percent listened to the tapes more than once.

The men assessed the quality of the GutBusters tapes. Ninety five percent of the men found the tapes extremely easy (1), or easy (2) to understand (Refer Figure 4.10A). Ninety five percent of the men stated that the tapes were easy to listen to (1 or 2), whilst only four percent found them difficult to listen to (4 or 5) (Refer Figure 4.10B).

**Figure 4.10A Audio cassette satisfaction rating**
4.11 Participant feelings regarding lifestyle changes

Sixty four percent of the men felt that they would be successful (2), or extremely successful (1) in maintaining the changes to their lifestyles, brought about by the correspondence program. Thirty one percent were unsure (3) of their ability to maintain the changes to their lifestyle, whilst only four percent felt that they would have difficulties maintaining these changes. No one felt that it would be extremely difficult to maintain these changes (Refer Figure 4.11A).

Figure 4.11B Individual audio cassette quality

![Graph showing audio cassette quality satisfaction ratings.]

Figure 4.11A Maintaining changes

![Graph showing satisfaction with maintaining lifestyle changes.]

4.12 Confidence levels of waist measurement

Seventy three percent of the men felt that they were confident (1 or 2) in measuring themselves around the waist, compared to four percent which did not feel confident (4). None of the participants were extremely unconfident about measuring their waist. One participant did not answer this question (Refer Figure 4.12A).

Figure 4.12A  Confidence of waist measurement

<table>
<thead>
<tr>
<th>Satisfaction Rating</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Extremely confident</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5 Not very confident</td>
<td>0</td>
</tr>
</tbody>
</table>

4.13 Participant expectations

The GutBusters correspondence program met the men’s expectations to differing degrees. Eighty five percent had their expectations met well, or extremely well (1 or 2), 2 percent felt it did not meet expectations (4) and 2 percent felt that their expectations were not met at all (5). The group based program had similar results. The group based study used a ranking system from 5 (extremely well) to 1 (not at all well). Ninety two percent of the participants felt that the group based program met their expectations well
or extremely well (4 or 5). Less than one percent of the participants rated the program as not meeting their needs (O’Neill 1993).

Figure 4.13A Expectations

4.14 Course components.

The GutBusters correspondence course components were assessed to determine participant satisfaction. The individual components, including the book, audio cassettes, tape measure, handouts, weekly feedback and telephone hotline, were assigned a five point rating scale from excellent to very poor. Only the man rated the book as poor, the remainder of the participants felt the book was excellent, good, or moderate (Refer Figure 4.14A). The tape measure rated the poorest of all components. Eighteen participants felt that the quality of the tape was poor or very poor (Refer Figure 4.14B). All of the men were satisfied with the handouts (Refer Figure 4.14C). Most of the men were satisfied with weekly feedback, only five men rated the weekly feedback as poor (Refer Figure 4.14D).
Figure 4.14A Book satisfaction rating

Figure 4.14B Tape measure satisfaction rating

Figure 4.14C Satisfaction rating for handouts
Only 11 men used the GutBusters hotline whilst doing the GutBusters by mail program. Nine men felt that the hot line met their needs well, or extremely well, one man felt it met his needs moderately well and none of the men who used the hotline felt it did not meet their needs. One man did not rate the hot line, even though he used it.

4.15 Participant’s suggestions for program improvement

There were several suggestions made by the participants to improve the correspondence program. One man felt that there was not enough follow up. One participant felt that weekly feedback seemed to be standard responses, making it a little impersonal. Another felt that there was no need for a hotline. However that same participant suggested that the staff at GutBusters contact the participants half way through their program to see how they are going. Another participant felt the hotline could be improved by making it a free call. Several participants suggested that a better quality measure tape should be employed. Two participants felt that there was conflicting information between the audio
cassette and print, but did not identify where it was. One participant's efforts were hampered by delays in mail delivery to Western Australia and he felt that this marred the course.
5. DISCUSSION.

5.1 The correspondence program

It is believed that this is the first Australian correspondence fat control program designed specifically for men. Any previous correspondence programs were not weight or gender specific.

Despite concern that the GutBusters correspondence program might be less effective than group sessions (Wood 1990) and the fear that the lack of group support may result in poorer fat loss levels, the correspondence form of the GutBusters program proved to be as successful as the group based program. Both programs achieved statistically significant results in waist loss. Seventy three percent of participants in the correspondence program reached the program goal of a five percent waist loss. Whilst 72 percent of the participants in the group based program met the program goal. All of the participants in the correspondence program lost body fat. These figures are encouraging for participants, staff, and health professionals as they indicate a high level of program success.

Correspondence programs are well suited to a continent as vast as Australia. The GutBusters program format is also suitable to shift workers and men involved in work which takes them away from home. Correspondence programs are less costly than many group based programs and they allow health professionals to access a larger audience. They are an alternative for people who do not wish to participate in group
based interventions. The GutBusters correspondence format allows participants to listen to the lectures at their own convenience, whilst receiving personalised feedback and access to the GutBusters hotline for any inquiries.

The characteristics demonstrated by people who are most likely to enroll in correspondence courses suits the target group of the GutBusters program. They are older, better educated and more often male (Schmid et al 1989). It seems also that the correspondence program may appeal to a different audience. Many people do not need intensive group training to make the necessary interventions for fat loss (Jeffery et al 1982, Schmid et al 1989). The average age of GutBusters participants is 51 years, and GutBusters only targets the male population.

Many fat reduction programs are aimed at the female population. This correspondence program addresses the needs of the male population. Men are more commonly affected by android fat distribution, and are at greater risk of serious illness than females. Furthermore, more men (over the age of 45) are obese than females (Danforth et al 1991). This program helps to reduce the inequalities for men in the Australian health industry (Fletcher 1993). To date there has been little research into Australian men and obesity (Burns et al 1991). This study adds to the limited body of knowledge of male fat reduction strategies.

Overall the participants gave high ratings for the course components. The quality and content of the audiocassettes were rated high. The men were satisfied with the quality of the handouts. With the exception of one, they were satisfied with the book. The
areas which could be improved were the GutBusters feedback and the GutBusters tape measure. The tape measure in particular could be improved, as it rated poorly compared to the remaining components of the course. For all except two men, the GutBusters by mail program met their expectations.

With respect to participation, the correspondence program proved more effective than the group based program. Ninety seven percent of the men in the correspondence program reported that they completed all of the GutBuster’s sessions on audio cassette whereas only 57 percent of the men completed all of the sessions in the group based program. Many men had found it difficult to commit themselves to all of the sessions in the six week group based program. With the correspondence program, the lectures could be listened to on audiocassette at the individual’s leisure. They were not committed to a date or time. This highlights the convenience of the correspondence program.

It was interesting that only two men felt that they would be unable to maintain the lifestyle changes that they had made since beginning the correspondence program. Many of the men made significant changes to their dietary intake, exercise habits and alcohol consumption. It was possible that because of a lack of knowledge, the participants in the correspondence program had not made these lifestyle changes before. This could support Egger and Mowbray’s belief (1992) that increasing men’s knowledge about healthy lifestyle habits was one of the primary factors contributing to fat loss. Crawford et al (1990) also indicated a need for improved fat loss information for men. Another possible reason for the participants being able to maintain the
lifestyle changes was that GutBusters encourages participants to incorporate the program into their lifestyle. The lifestyle interventions of the GutBusters program are general, there was no hard and fast diet to adhere to, the participants do not have to give up alcohol, and the type of moderate, long duration exercise is up to the individual (although walking is encouraged) (Egger and Stanton 1992). These results are encouraging, as maintenance of the lifestyle changes guarantees maintained waist loss, and improved health status.

Participant response rates to final evaluations were poor in previous correspondence programs (Jeffery et al 1990). This problem also occurred in the GutBusters correspondence program. The fact that participants were mailed their post evaluation questionnaire, compared with participants in the group based program who complete the post evaluation questionnaire during their last session, could account for a lower response rate. Worsley (1989) reported a similar problem of a low response rate of participants to mail surveys. He found it necessary to send three reminders to gain a response rate of between 75 and 80 percent. Some of the men in the GutBusters correspondence program were telephoned three times, and offered an incentive to return their evaluation. Still the response was surprisingly small. It was interesting that all of the men complete their pre-evaluation questionnaire and returned it. The participants may have felt that the pre-evaluation was important to their success. If the post-evaluation was made to be as important to the men as the pre-evaluation, the response rate may improve. For instance, if the men were to return their final waist and hip measure with their post evaluation, and offered information on how they have
improved their lifestyle factors as well as their measurements, the number of post-evaluation's which are returned may increase.

Some of the participants in the GutBusters correspondence program felt that there was a need for more contact from the GutBusters staff throughout the program. The need for such support also was found by Jeffery et al (1990). They found that mail programs which provided more contact with participants were more effective. Bjorvell and Rossner (1985) found that the key to lasting program success was active support and encouragement. Contact with the GutBusters office could provide extra support for those correspondence participants who felt that they would have prefered to be part of a group program. Furthermore, it may improve the success of the participants in the GutBusters program even more.

5.2 Anthropometric changes

Seventy three percent of the men involved in the study met the program aim of a five percent fat reduction over the program period. The average waist loss was 7.27cm. The minimum waist loss was 2 percent of the participant's original waist measure. No one in this study failed to experience any waist loss. The participants experienced a significant reduction in hip circumference of 3.08 percent. Whilst this result was not expected (Emery et al 1993), O Neill (1993) experienced a similar result in the group based GutBusters study. The correspondence program average percentage fat loss from the hips was half of the amount of the fat loss from their waist. All of the men involved in the correspondence program commenced with a WHR in the high health
risk category (0.9 or greater) (Egger and Stanton 1992). All of the men with the exception of one, experienced some form of reduction in their WHR. The average reduction in WHR was 0.04. Thirty three percent of the men achieved a five percent reduction in their WHR. This is important, as the WHR is considered to be an important indicator of health risk and a moderate reduction in fat has been shown to reduce health risk (Tuomilehto 1987, Robinson et al 1993). The percentage of men who experienced a reduction in WHR may have been higher if there were not so many men whose hip loss was greater or equal to their waist loss. This was one of the problems associated with using the WHR as a measure of fat loss (van der Kooy et al 1993). In general, these results are very encouraging for men enrolling in the program, and for the course designers, as a decrease in body fat has an associated decrease in health risk factors.

Controversy over the accuracy of self measurement of the waist and hip ratios was a complication of the correspondence format of the GutBusters program (Lavery et al 1993). In the group based format of the GutBusters course, the instructor demonstrates the correct techniques for measuring for the WHR, and supervised each individual. Men involved in the correspondence program were never supervised or given demonstrations to ensure that they were taking the measurement correctly. However, the WHR was probably the most accurate measure available to the correspondence program. There were few alternatives available to correspondence participants. Measuring weight was not a true indicator of total body fat (Danforth et al 1991; Egger 1992), so the use of bathroom scales was not a satisfactory option. Most other means of measuring weight change (ie: computer tomography, skin fold
measure, CT scan, ultrasound, magnetic resonance) were either not available, expensive or inconvenient for those choosing the correspondence format of the GutBusters program. Controversy over the accuracy of self reported waist and hip measurements are cause for concern in this study. However, lack of a suitable, practical, low cost and more accurate alternative made it necessary to utilise the best option lending itself to this type of program format.

5.3 Behaviour questionnaires

The alcohol and exercise questionnaires allow for monitoring of change in participants' lifestyle behaviours. However, these instruments have not been validated, which may mean that they are not accurate indicators of change. Lack of a suitable alternative, and the use of these instruments as a standard protocol for the program, made it necessary to use these questionnaires to gauge the effects of the program.
6. LIMITATIONS OF THE STUDY

There were some limitations to this study which are acknowledged below.

This study lacked a control group, thus changes in behavioural and anthropometric measures cannot be directly attributed to the GutBusters by mail program. However, tests for significance indicate that it is most probable that the changes in measurements and behaviour of the men were due to the GutBusters correspondence program.

There was a risk that self reported measurements in the correspondence program may be inaccurate (Lavery et al 1993). It was possible that a man who was embarrassed to admit a failure to decrease their waist or hip size, or other obesity related behaviours, may return inaccurate data. Those in the group based program could not falsify their waist and hip size as measurements were taken during the GutBusters session.

Several participants of the correspondence program did not return their final hip measurement. Thus their change in hip and WHR could not be evaluated. If they had been part of the correspondence program, waist and hip measurements would have been taken and recorded during the last session of the program, ensuring that the data were collected.

There was conflicting evidence over the accuracy of the WHR as a measure of fat loss related to reduced health risk (Egger 1992, Emery et al 1993, van der Kooy 1993).
However, the WHR is the most appropriate form of measure for the correspondence program. It is more accurate and convenient than the skinfold measurement (Emery et al 1993). The WHR is more accurate than bathroom scales (Danforth et al 1991).

Participant post evaluation response rates were poor in the correspondence program. This also occurred in similar correspondence studies (Worsley 1989). Low participant response rates can lead to bias, as a particular type of person may refuse to participate in the study (Hawe et al 1990).
7. CONCLUSION

The correspondence format of the GutBusters program proved to be as successful as the group based GutBusters format amidst fears that lack of group support and the need for self discipline may weaken program success. The program aims were met, as male abdominal obesity was reduced in the participants so as to decrease their health risk. The men in the correspondence GutBusters program made significant changes to their waist, hip and WHR. They made notable changes to their dietary intake, alcohol consumption and exercise regimes. Seventy three percent of the men reached the program goal of a five percent waist reduction. All of the men in the correspondence program lost body fat from their waist.

The correspondence format of the GutBusters program overall rated highly according to the course participants. It seems that the program met the needs of the participants, and resulted in significant changes in lifestyle factors to improve their standard of health, and might therefore improve their longevity. Finally, this document highlights the success of possibly the first correspondence weight control program for men in Australia.
8.1 Recommendations.

Men participating in the group based program, who are unable to attend all of the GutBuster session, could be given the opportunity to purchase audio cassettes from the correspondence program with the appropriate lectures. This would increase the number of participants in the group based program who have heard all the sessions in the GutBusters program.

There is a need to improve the quality of the measurement tape supplied to members of the correspondence course. A material tape measure would be easier to use, and less likely to break.

To ensure that accurate evaluation of the correspondence course occurs, participants could be encouraged to send their evaluation forms in with their final waist and hip measurements. A report indicating their improvement since the beginning of the course may increase the post evaluation response rate.

Individuals could be assigned a supervisor who contacts them midway through the course, and at the completion of the course. This would encourage those men who may be feeling disheartened, and personalise the program for those men who prefer to be part of a group.
To further enhance the format of the correspondence course, the kit also could be offered in a video format. This may personalise the course even more and allow demonstration of correct measurement techniques.

8.2 Areas for further investigation

Some suggestions for further investigation are considered below.

Further research in the area of validated instruments for exercise and alcohol behaviour would benefit the fat control industry.

A long term study of the effects of the GutBusters by mail program would add to the body of knowledge regarding the health benefits of fat loss programs, particularly a program as unique as the GutBusters correspondence program.

There is a need to standardise the location for the body measurement of the WHR.
REFERENCE LIST.


Participant Questionnaire

Please fill out the questionnaires as carefully as possible. Your answers are important for your individual analysis and achievements.

Given Name: __________________________
Surname: ______________________________
Date of Birth: _________________________ Todays date: _________________________
Address: ____________________________________________
Suburb: ____________________________ PostCode: ____________________________
Phone No: B.H.(____)_____________ Mobile: (____)____________________
Phone No: A.H.(____)_____________ Fax No: (____)____________________
Occupation: _________________________________________________
Company(optional): __________________________________________
Marital Status(optional): Married ______  Single ______  Divorced ______

How did you hear about the GutBusters Program?

Please tick: ☐ Newspaper Which one? ____________________________
            ☐ Radio Which station/program ____________________________
            ☐ Television Which station/program ____________________________
            ☐ Spouse/Partner told me about it
            ☐ Friend told me about it ☐ Work
            ☐ Friend did course ☐ Other ____________________________

©1994 GutBusters Pty Ltd
Who was the strongest influence on your decision to join GutBusters By Mail?

- Spouse/Partner  □  Other family  □
- Friend  □  Doctor  □
- Physiotherapist  □  Dietitian  □
- Chiropractor  □  Self Motivated  □
- Other  □  Who ____________________

Medical History:
Have you been told by your doctor or do you know whether you have any of the following conditions?

- High Blood Pressure □ □ □
- Heart Problems □ □ □
- Diabetes □ □ □
- Asthma □ □ □
- Arthritis □ □ □
- Gallstones □ □ □
- Epilepsy □ □ □
- Sleep apnoea □ □ □
- High Cholesterol □ □ □
- High Triglycerides □ □ □

Any other ailments ____________________________________________

Are you taking any medication? If so, please list:
___________________________________________________________
___________________________________________________________

Please write down your measurements as instructed in the Session 1 tape and handouts.
Waist: __________ cm  How tall are you? __________
Hips: __________ cm
Nutrition Questionnaire
(Tick a box in each question)

1. How often do you eat fried food with a batter or breadcrumb coating?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

2. How often do you eat gravy, cream sauces or cheese sauces?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

3. How often do you add butter, margarine, oil or sour cream to vegetables, cooked rice or spaghetti?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

4. How often do you eat vegetables that are fried or roasted with fat or oil?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

5. How is your meat usually cooked?
   - Fried
   - Stewed or goulash
   - Grilled or roasted with added oil or fat
   - Grilled or roasted without added oil or fat
   - Eat meat occasionally or never

6. How many times a week do you eat sausages, devon, salami, meat pies, hamburgers or bacon?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

7. How do you spread butter/margarine on your bread?
   - Thickly
   - Medium
   - Thinly
   - Don’t use butter or margarine
8. How many times a week do you eat chips or french fries?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

9. How often do you eat pastries, cakes, sweet biscuits or croissants?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

10. How many times a week do you eat chocolate, chocolate biscuits or sweet snack bars?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never

11. How many times a week do you eat potato crisps, corn chips or nuts?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never

12. How often do you eat cream?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never

13. How often do you eat ice cream?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never

14. How many times a week do you eat cheddar, edam or other hard cheese, cream cheese or cheese like camembert?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never
15. What type of milk do you drink, or use in cooking, or use in tea and coffee?
- Condensed
- Full-cream
- Full-cream and reduced fat
- Reduced-fat
- Skim or none

16. How much of the skin on your chicken do you eat?
- Most or all of the skin
- Some of the skin
- None of the skin/I am vegetarian

17. How much of the fat on your meat do you eat?
- Most or all of the fat
- Some of the fat
- None of the fat/I am a vegetarian
Drinks Intake Questionnaire

1. How often do you drink alcohol? (tick a box in each question)
   □ Less than 1 day a week (or never)
   □ 1–2 days a week
   □ 3–4 days a week
   □ 5–6 days a week
   □ Every day

2. When you drink alcohol how much do you usually drink? (1 standard drink is a 285ml glass of beer, 1 nip of spirits or 1 glass of wine)
   □ Never drink alcohol
   □ 1–2 drinks
   □ 3–4 drinks
   □ 5–10 drinks
   □ More than 10 drinks

3. How often do you drink soft drinks? (eg cola, lemonade, flavoured mineral water — don’t count diet drinks)
   □ Less than 1 day a week (or never)
   □ 1–2 days a week
   □ 3–4 days a week
   □ 5–6 days a week
   □ Every day

4. When you drink soft drinks (not counting diet drinks) how much do you usually drink?
   □ Never drink soft drink
   □ 1–2 drinks
   □ 3–4 drinks
   □ 5–10 drinks
   □ More than 10 drinks

5. How often do you drink fruit juices?
   □ Every day
   □ 5–6 days a week
   □ 3–4 days a week
   □ 1–2 days a week
   □ Less than 1 day a week (or never)

6. When you drink fruit juices how much do you usually drink?
   □ Never drink fruit juice
   □ 1–2 drinks
   □ 3–4 drinks
   □ 5–10 drinks
   □ More than 10 drinks

GutBusters
C1994
Exercise Questionnaire

(Tick a box in each question)

1. How often would you do any form of exercise (such as walking, jogging, swimming etc)
   - Rarely or never
   - 1-2 days a week
   - 3-4 days a week
   - More than 4 days a week

2. When you do this, how long would you usually do it for?
   - Rarely or never do it
   - Less than 15 minutes
   - 15-30 minutes
   - More than 30 minutes

3. What level of intensity would you generally do this at?
   - Light (e.g. slow walking, golf, gentle cycling, bowls, doubles tennis etc.)
   - Moderate (e.g. brisk walking, cycling, swimming, singles tennis etc.)
   - Heavy (e.g. jogging, squash, aerobics, vigorous sports etc.)
Participant Evaluation Questionnaire

Please fill out the questionnaires as carefully as possible. Your answers will allow us to gauge how successful we have been in helping you to reduce your waistline. When you complete this questionnaire please send it to us in the Reply Paid envelope provided.

Surname: ____________________________
Given Name: _________________________
Today's date: _________________________
Phone No: B.H.__________
Phone No: A.H.__________

1. What was the major influence on your decision to join GutBusters By Mail, rather than a GutBusters group course? (You may tick more than one option)
   - I would rather reduce my waistline on my own
   - I would have preferred to join a group course, but none were running in my area
   - Shift work prevented me from attending weekly meetings
   - Travel prevented me from attending weekly meetings
   - I received GutBusters By Mail as a gift
   - Other ____________________________

2. How many times did you listen to your By Mail audio tapes?
   - Just once
   - More than once. How many times_________________________

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3. Did any other people listen to your By Mail audio tapes?
   - No (Go to question 5)
   - Yes

4. Who listened to your By Mail audio tapes? (You may tick more than one option)
   - Wife/partner
   - Other family member. Who ______________
   - Friend
   - Other ____________________________

5. Was there anything that you listened to on your By Mail audio tapes that didn’t correspond to the written materials?
   - Yes. Please tell us __________________________________________________________
   - No

6. Where did you listen to your By Mail audio tapes? (e.g. in the car, in bed, etc.)
   __________________________________________________________

7. What time of the day did you listen to your By Mail audio tapes? (e.g. first thing in the morning, at lunch, just before bed, etc.)
   __________________________________________________________

8. How do you rate each of the following components of the By Mail program?

<table>
<thead>
<tr>
<th>Component</th>
<th>Excellent</th>
<th>Good</th>
<th>OK</th>
<th>Poor</th>
<th>Very Poor</th>
</tr>
</thead>
<tbody>
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<td>Book</td>
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<td>Weekly Feedback</td>
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<td>Telephone Hotline</td>
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</tr>
</tbody>
</table>
9. How well did the GutBusters By Mail Program meet your expectations? (Please circle your rating)

Extremely well 1 2 3 4 5 Not at all well

10. If you are working, would other men at your workplace benefit from the GutBuster By Mail Program?

☐ Yes. Please tell us if there is someone we should contact to explain how GutBusters can operate at your workplace

☐ No

11. If you have any suggestions of how we could improve the GutBusters By Mail Program, please write them here?


12. Are there any other male health programs that you would like to join using the By Mail audiotape format?

☐ Men’s health generally

☐ Stress Relief

☐ Relaxation

☐ Mid-life Health

☐ Injury Prevention

☐ Fitness

☐ Other ____________________________
We are very interested to know if you have changed any of your eating, drinking or exercise habits since joining the GutBuster By Mail Program. Please answer these questions as they apply to you today.

Nutrition Questionnaire

(Tick a box in each question)

1. How often do you eat fried food with a batter or breadcrumb coating?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

2. How often do you eat gravy, cream sauces or cheese sauces?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

3. How often do you add butter, margarine, oil or sour cream to vegetables, cooked rice or spaghetti?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

4. How often do you eat vegetables that are fried or roasted with fat or oil?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

5. How is your meat usually cooked?
   - Fried
   - Stewed or goulash
   - Grilled or roasted with added oil or fat
   - Grilled or roasted without added oil or fat
   - Eat meat occasionally or never

6. How many times a week do you eat sausages, devon, salami, meat pies, hamburgers or bacon?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never
7. How do you spread butter/margarine on your bread?
   - Thickly
   - Medium
   - Thinly
   - Don’t use butter or margarine

8. How many times a week do you eat chips or french fries?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

9. How often do you eat pastries, cakes, sweet biscuits or croissants?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

10. How many times a week do you eat chocolate, chocolate biscuits or sweet snack bars?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never

11. How many times a week do you eat potato crisps, corn chips or nuts?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never

12. How often do you eat cream?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never

13. How often do you eat ice cream?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never
14. How many times a week do you eat cheddar, edam or other hard cheese, cream cheese or cheese like camembert?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

15. What type of milk do you drink, or use in cooking, or use in tea and coffee?
   - Condensed
   - Full-cream
   - Full-cream and reduced fat
   - Reduced-fat
   - Skim or none

16. How much of the skin on your chicken do you eat?
   - Most or all of the skin
   - Some of the skin
   - None of the skin/I am vegetarian

17. How much of the fat on your meat do you eat?
   - Most or all of the fat
   - Some of the fat
   - None of the fat/I am a vegetarian
Drinks Intake Questionnaire

1. How often do you drink alcohol? (tick a box in each question)
   - Less than 1 day a week (or never)
   - 1–2 days a week
   - 3–4 days a week
   - 5–6 days a week
   - Every day

2. When you drink alcohol how much do you usually drink? (1 standard drink is a 285ml glass of beer, 1 nip of spirits or 1 glass of wine)
   - Never drink alcohol
   - 1–2 drinks
   - 3–4 drinks
   - 5–10 drinks
   - More than 10 drinks

3. How often do you drink soft drinks? (eg cola, lemonade, flavoured mineral water — don’t count diet drinks)
   - Less than 1 day a week (or never)
   - 1–2 days a week
   - 3–4 days a week
   - 5–6 days a week
   - Every day

4. When you drink soft drinks (not counting diet drinks) how much do you usually drink?
   - Never drink soft drinks
   - 1–2 drinks
   - 3–4 drinks
   - 5–10 drinks
   - More than 10 drinks

5. How often do you drink fruit juices?
   - Every day
   - 5–6 days a week
   - 3–4 days a week
   - 1–2 days a week
   - Less than 1 day a week (or never)

6. When you drink fruit juices how much do you usually drink?
   - Never drink fruit juices
   - 1–2 drinks
   - 3–4 drinks
   - 5–10 drinks
   - More than 10 drinks
Exercise Questionnaire

(Tick a box in each question)

1. How often would you do any form of exercise (such as walking, jogging, swimming etc)
   - □ Rarely or never
   - □ 1-2 days a week
   - □ 3-4 days a week
   - □ More than 4 days a week

2. When you do this, how long would you usually do it for?
   - □ Rarely or never do it
   - □ Less than 15 minutes
   - □ 15-30 minutes
   - □ More than 30 minutes

3. What level of intensity would you generally do this at?
   - □ Light (e.g. slow walking, golf, gentle cycling, bowls, doubles tennis etc.)
   - □ Moderate (e.g. brisk walking, cycling, swimming, singles tennis etc.)
   - □ Heavy (e.g. jogging, squash, aerobics, vigorous sports etc.)

Thankyou very much for taking the time to fill in this questionnaire!!!

Please send it to us now in the Reply Paid envelope provided.

GutBusters
Invitation to Participate in a GutBusters Research Study

Dear GutBuster,

As a student of the University of Wollongong, Anne-Maree Parrish is undertaking a study to evaluate the GutBusters By Mail program. This study is part of the requirements for the completion of a Master of Public Health Degree, under the supervision of Heather Yeatman and Professor Charles Watson. Approval to conduct the research has been received from GutBusters Pty Ltd and the University of Wollongong,

Information used in this study will be obtained from questionnaires filled out by men participating in the GutBusters By Mail Program. The results of the questionnaires will be compared with the answers you gave at the start of the program.

The aim of the study is to determine the effectiveness of GutBusters By Mail and compare it to the results achieved by the original GutBusters Program.

All information gathered is confidential. You are free to withdraw from the study at any time and any information that you have provided will not be used. Your decision not to participate in the study will in no way influence your participation in the GutBusters Program.

If you have no objections to participating, please fill out the questionnaire and sign the consent form enclosed with this letter. These are to be mailed to GutBusters in the Reply Paid envelope provided.

If you need any additional directions or have any queries regarding the study please contact the GutBusters hot line on 1800 674 688. Any complaints regarding the conduct of the study may be directed to the Secretary of the University of Wollongong Human Experimentation Ethics Committee on (042) 213 079.

Regards,

Dr Garry Egger - Director

P.S. Thankyou for taking the time to complete this questionnaire.

---

Scientific Advisory Board

**Nutrition:**

**Psychology:**
Professor Neville Owen B.A.(Hons), Ph.D. M.A.P., S. Professor of Human Movement Science, Deakin University,

**Exercise Science:**
Dr Richard Telford Dip.P.E., BSc., M.Sc., Ph.D., AM. Australian Institute of Sport & ANU Canberra

**Director:**
Dr Garry Egger BA, MPH, Ph.D. Centre for Health Promotion and Research, Sydney

**Medicine:**
Professor Terry Dwyer MBBS, MPH, MD, FAFPHM. School of Medicine; University of Tasmania

**Human Nutrition:**
Professor Kerin O’Dea B.Sc., PH.D. Dean, Faculty of Health & Behavioural Sciences,
I understand:

- what the proposed study involves;
- that the study is conducted as part of a Master of Public Health (Health Promotion) degree at the University of Wollongong under the supervision of Ms Heather Yeatman and Professor Charles Watson;
- that all information gathered is confidential;
- that I can withdraw from the study at any time if I wish to and that any information provided will not be used;
- that my decision not to participate will in no way influence my participation in the Gutbusters Waist Loss Program;

and

- that any enquiries or complaints regarding the study may be directed to the Secretary of the University of Wollongong Human Experimentation Ethics Committee on (042) 231 079.

__________________________
Signature of Participant

__________________________
Name of Participant

__________________________
Member No.
Participant Evaluation Questionnaire

Please fill out the questionnaires as carefully as possible. Your answers will allow us to gauge how successful we have been in helping you to reduce your waistline. When you complete this questionnaire please send it to us in the Reply Paid envelope provided.

Membership No.: ____________________
Surname: ___________________________
Given Name: _________________________
Today’s date: ________________________
Phone No: B.H.(__ )____________________
Phone No: A.H.(__ )____________________
1. Instead of doing GutBusters By Mail, would you have preferred to have been part of a group to help motivate you in your efforts to reduce your waist?

- Yes
- No

2. What was the major influence on your decision to join GutBusters By Mail, rather than a GutBusters group course? (You may tick more than one option)

- I would rather reduce my waistline on my own
- I would have preferred to join a group course, but was unable to in my area
- Shift work prevented me from attending weekly meetings
- Travel prevented me from attending weekly meetings
- I received GutBusters By Mail as a gift
- Other __________________________

3. How many times did you listen to each of your By Mail audio tapes?

- Just once
- More than once. How many times __________________________

4. Did you listen to all the tapes?

- Yes
- No

5. How easy or difficult did you find the tapes to listen to? (Please circle your rating)

<table>
<thead>
<tr>
<th>Extremely easy</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Extremely difficult</th>
</tr>
</thead>
</table>

6. How easy or difficult did you find the tapes to understand? (Please circle your rating)

<table>
<thead>
<tr>
<th>Extremely easy</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Extremely difficult</th>
</tr>
</thead>
</table>
7. How successful do you feel that you will be in maintaining any of the changes that you have made on the By Mail program? (Please circle your rating)

| Extremely successful | 1 | 2 | 3 | 4 | 5 | Not at all successful |

8. How confident are you in measuring yourself around the waist in comparison to when you started? (Please circle your rating)

| Extremely confident | 1 | 2 | 3 | 4 | 5 | Not at all confident |

9. How well did the GutBusters By Mail Program meet your expectations? (Please circle your rating)

| Extremely well | 1 | 2 | 3 | 4 | 5 | Not at all well |

10. Was there anything about the GutBusters By Mail program that you disliked?

- [ ] Yes.
  
  Please tell us what you disliked

- [ ] No

11. If you have any suggestions of how we could improve the GutBusters By Mail Program, please write them here:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
12. How do you rate each of the following components of the By Mail program?

<table>
<thead>
<tr>
<th>Component</th>
<th>Excellent</th>
<th>Good</th>
<th>OK</th>
<th>Poor</th>
<th>Very Poor</th>
</tr>
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<tbody>
<tr>
<td>Book</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Audio Tapes</td>
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<td>Tape Measure</td>
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<td>Telephone Hotline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. GutBusters ByMail programs have been successfully run for groups of men in companies all around Australia. If you are working, would other men at your workplace benefit from the GutBuster By Mail Program?

- Yes.
- No

Please tell us if there is someone we should contact to explain how GutBusters can operate at your workplace.

14. Did you use the GutBusters telephone ‘hotline’?

- Yes
- No

15. Are there any other male health programs that you would like to join using the By Mail audiotape format?

- Men’s health generally
- Stress Relief
- Relaxation
- Mid-life Health
- Injury Prevention
- Fitness

Other: ____________________________
We are very interested to know if you have changed any of your eating, drinking or exercise habits since joining the GutBuster By Mail Program. Please answer these questions as they apply to you today.

Nutrition Questionnaire

(Tick one box only in each question)

1. How often do you eat fried food with a batter or breadcrumb coating?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

2. How often do you eat gravy, cream sauces or cheese sauces?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

3. How often do you add butter, margarine, oil or sour cream to vegetables, cooked rice or spaghetti?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

4. How often do you eat vegetables that are fried or roasted with fat or oil?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

5. How is your meat usually cooked?
   - Fried
   - Stewed or goulash
   - Grilled or roasted with added oil or fat
   - Grilled or roasted without added oil or fat
   - Eat meat occasionally or never

6. How many times a week do you eat sausages, devon, salami, meat pies, hamburgers or bacon?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never
7. How do you spread butter/margarine on your bread?
   - Thickly
   - Medium
   - Thinly
   - Don’t use butter or margarine

8. How many times a week do you eat chips or french fries?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

9. How often do you eat pastries, cakes, sweet biscuits or croissants?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

10. How many times a week do you eat chocolate, chocolate biscuits or sweet snack bars?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never

11. How many times a week do you eat potato crisps, corn chips or nuts?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never

12. How often do you eat cream?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never

13. How often do you eat ice cream?
    - Six or more times a week
    - 3-5 times a week
    - 1-2 times a week
    - Less than once a week
    - Never
14. How many times a week do you eat cheddar, edam or other hard cheese, cream cheese or cheese like camembert?
   - Six or more times a week
   - 3-5 times a week
   - 1-2 times a week
   - Less than once a week
   - Never

15. What type of milk do you drink, or use in cooking, or use in tea and coffee?
   - Condensed
   - Full-cream
   - Full-cream and reduced fat
   - Reduced-fat
   - Skim or none

16. How much of the skin on your chicken do you eat?
   - Most or all of the skin
   - Some of the skin
   - None of the skin/I am vegetarian

17. How much of the fat on your meat do you eat?
   - Most or all of the fat
   - Some of the fat
   - None of the fat/I am a vegetarian
Drinks Intake Questionnaire

1. How often do you drink alcohol? (tick one box only in each question)
   - Less than 1 day a week (or never)
   - 1–2 days a week
   - 3–4 days a week
   - 5–6 days a week
   - Every day

2. When you drink alcohol how much do you usually drink? (1 standard drink is a 285ml glass of beer, 1 nip of spirits or 1 glass of wine)
   - Never drink alcohol
   - 1–2 drinks
   - 3–4 drinks
   - 5–10 drinks
   - More than 10 drinks

3. How often do you drink soft drinks? (eg cola, lemonade, flavoured mineral water — don’t count diet drinks)
   - Less than 1 day a week (or never)
   - 1–2 days a week
   - 3–4 days a week
   - 5–6 days a week
   - Every day

4. When you drink soft drinks (not counting diet drinks) how much do you usually drink?
   - Never drink soft drinks
   - 1–2 drinks
   - 3–4 drinks
   - 5–10 drinks
   - More than 10 drinks

5. How often do you drink fruit juices?
   - Every day
   - 5–6 days a week
   - 3–4 days a week
   - 1–2 days a week
   - Less than 1 day a week (or never)

6. When you drink fruit juices how much do you usually drink?
   - Never drink fruit juices
   - 1–2 drinks
   - 3–4 drinks
   - 5–10 drinks
   - More than 10 drinks
Exercise Questionnaire

(Tick one box only in each question)
1. How often would you do any form of exercise (such as walking, jogging, swimming etc)
   - Rarely or never
   - 1-2 days a week
   - 3-4 days a week
   - More than 4 days a week

2. When you do this, how long would you usually do it for?
   - Rarely or never do it
   - Less than 15 minutes
   - 15-30 minutes
   - More than 30 minutes

3. What level of intensity would you generally do this at?
   - Light (e.g. slow walking, golf, gentle cycling, bowls, doubles tennis etc.)
   - Moderate (e.g. brisk walking, cycling, swimming, singles tennis etc.)
   - Heavy (e.g. jogging, squash, aerobics, vigorous sports etc.)

If you have done this program through your workplace please make sure you complete the following page before mailing the questionnaire back to us.

Thank you very much for taking the time to answer our questions!

Please send the questionnaire back to us in the Reply Paid envelope provided so that you don't pay for postage.
## APPENDIX A9

### Waist Loss

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
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</thead>
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<tr>
<td>Standard Error</td>
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<tr>
<td>Median</td>
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</tr>
<tr>
<td>Mode</td>
<td>7</td>
</tr>
<tr>
<td>Standard Deviation</td>
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</tr>
<tr>
<td>Sample Variance</td>
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<tr>
<td>Kurtosis</td>
<td>0.18058276</td>
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<tr>
<td>Skewness</td>
<td>0.55999921</td>
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<tr>
<td>Range</td>
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<tr>
<td>Minimum</td>
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<tr>
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<td>Count</td>
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<tr>
<td>Confidence Level(95.000%)</td>
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### t-Test: Paired Two Sample for Means - Waist

<table>
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<th>Value</th>
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<tbody>
<tr>
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<td>df</td>
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<td>t Critical two-tail</td>
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</table>
### Hip loss

<table>
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<tr>
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<th>Value</th>
</tr>
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<tbody>
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<td>Kurtosis</td>
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<td>Confidence Level(95.000%)</td>
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#### t-Test: Paired Two Sample for Means - Hip

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<td>df</td>
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<td>t Stat</td>
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<td>1.0573E-07</td>
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<tr>
<td>t Critical two-tail</td>
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### Change in WHR

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<td>Mode</td>
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### t-Test: Paired Two Sample for Means - WHR

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## Pooled 2 sample t test

### Waist change

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<th>Original</th>
<th>Mail</th>
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<tbody>
<tr>
<td>Number</td>
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T = 1.1784739 \\
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\text{Critical value of } t \text{ @ 2.5% confidence } + \text{ or } -1.96
\]

### WHR change

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S^2_p = 0.001029 \\
T = -0.378416 \\
df = 402 \\
\text{Critical value of } t \text{ @ 2.5% confidence } + \text{ or } -1.96
\]

### Change in exercise behaviour

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S^2_p = 127.69726 \\
T = 0.9283556 \\
df = 303 \\
\text{Critical value of } t \text{ @ 2.5% confidence } + \text{ or } -1.96
\]

### Hip change

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<thead>
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<th></th>
<th>Original</th>
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S^2_p = 12.509911 \\
T = 0.9050396 \\
df = 402 \\
\text{Critical value of } t \text{ @ 2.5% confidence } + \text{ or } -1.96
\]
WILCOXAN SIGNED RANK TEST

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>T</th>
<th>Critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>one-tailed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.5% signif.</td>
</tr>
<tr>
<td>Alcohol frequency</td>
<td>21</td>
<td>2</td>
<td>58</td>
</tr>
<tr>
<td>Alcohol volume</td>
<td>24</td>
<td>7</td>
<td>81</td>
</tr>
<tr>
<td>Amount of exercise</td>
<td>34</td>
<td>7</td>
<td>182</td>
</tr>
<tr>
<td>Time exercising</td>
<td>28</td>
<td>2</td>
<td>116</td>
</tr>
<tr>
<td>Intensity exercising</td>
<td>25</td>
<td>5</td>
<td>89</td>
</tr>
</tbody>
</table>

Ho: r+ = r-
H1: r+ ≠ r-

For rejection of Ho T must be smaller than the critical value at 2.5%.

Sample size in relation to mean

n=(ZS/E)²

<table>
<thead>
<tr>
<th></th>
<th>Waist</th>
<th>Hip</th>
<th>WHR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z value @ 5% confidence</td>
<td>Z=1.96</td>
<td>Z=1.96</td>
<td>Z=1.96</td>
</tr>
<tr>
<td>S=Standard deviation</td>
<td>S=2.62</td>
<td>S=2.79</td>
<td>S=0.03</td>
</tr>
<tr>
<td>E=Precision level</td>
<td>E=0.5</td>
<td>E=1.0</td>
<td>E=0.85</td>
</tr>
<tr>
<td>n=Sample size required</td>
<td>Thus n=26.37</td>
<td>Thus n=29.9</td>
<td>Thus n=34.5</td>
</tr>
</tbody>
</table>

Pooled 2 sample t test (continued)

<table>
<thead>
<tr>
<th></th>
<th>Original</th>
<th>Mail</th>
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</thead>
<tbody>
<tr>
<td>Change in Dietary fat intake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>259</td>
<td>45</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>8.597</td>
<td>15</td>
</tr>
<tr>
<td>Average</td>
<td>15.63</td>
<td>15.76</td>
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<tr>
<td>S²p=</td>
<td>95.9217534</td>
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</tr>
<tr>
<td>t=</td>
<td>-0.08218719</td>
<td></td>
</tr>
<tr>
<td>df=</td>
<td>302</td>
<td></td>
</tr>
</tbody>
</table>

Critical value of t @ 2.5% confidence + or -1.96