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## *A randomised clinical trial to evaluate the effect of diet on weight loss and coping of people living with HIV and Lipodystrophy*

### **ABSTRACT**

#### **Aim**

The purpose of the research study was to evaluate a diet intervention in relation to the perceived weight loss and ways of coping of people living with HIV and lipodystrophy. The objectives were to:

1. Measure the perceived impact of weight loss upon men with HIV and lipodystrophy following a diet intervention;
2. Identify strategies used by men to cope with HIV and lipodystrophy following a diet intervention;

#### **Background**

HIV positive people on antiretroviral treatments are normalizing their lives and are facing a life long future. Morphological changes occur as a result of antiretroviral therapy causing HIV positive people to hesitate commencing treatment.

#### **Design**

An experimental design incorporating pretests and posttests of experimental and control groups was used in the study.

#### **Methods**

The sample consisted of 30 men over 18 years of age, living with HIV and lipodystrophy. All participants were surveyed by questionnaires and their perceived weight loss and ways of coping were measured at baseline and 10 weeks.

#### **Results**

Findings indicated a significant improvement for perceived weight loss and although not significant, all coping processes were used more by the participants in the intervention group compared to the control group.

#### **Conclusions**

The diet intervention demonstrated a positive effect particularly upon perceived weight loss on men living with HIV and Lipodystrophy in the study setting.

**Relevance to clinical practice**

Diet is a recommended management option for people who endure severe and distressing symptoms from antiretroviral therapy.

**Key Words:** experimental design, HIV/AIDS, nursing care, weight loss, coping, nurses.

## **INTRODUCTION**

Antiretroviral therapy is important in the management of people living with HIV as it reduces the potential of disease progression and thus the development of an AIDS defining illness. A range of side effects come as a consequence of antiretroviral therapy, which increases the risks of other disease processes and hence reduce the individual's quality of life. It is important to assist and encourage these people to continue taking their medication and at the same time minimise the side effects.

In recent years there have been rapid advancements in the development of antiretroviral therapy which have increased the health and survival prospects of people living with HIV/AIDS (Williams, 1999). Along with these therapies come adverse side effects such as extreme body shape changes for example, lipoatrophy, which result in social stigmatisation and clients taking 'drug holidays' or abandoning their treatment altogether (Shattuck, 2001). The risks associated with this include the possibility of disease progression (Katzenstein, 1997). Lipodystrophy is a recognised complication of some of the antiretroviral treatments (protease inhibitors and nucleoside reverse transcriptase inhibitors) used for HIV therapy (Carr *et al.* 1999). This paper will address the effect of diet on the participants' perceived weight loss and ways of coping.

### **Lipodystrophy**

Lipodystrophy is characterised by changes in the body shape of people who are taking a combination of antiretroviral therapy. The body shape changes are more apparent in those who are responding well to treatment, i.e. are healthy and full bodied in the first instance, have undetectable viral loads and improved CD4+lymphocyte (Kotler, 1998). Antiretroviral treatments are beneficial as they lower the viral load (plasma viral ribonucleic acid or RNA) allowing the immune system to recover somewhat and reduce the development of opportunistic illnesses (Lane, 1999). (Paton *et al.* 2000) reported that lipodystrophy also occurs in people with HIV who are not taking antiretroviral medication, thus making it difficult to determine lipodystrophy caused by the course of the disease or by treatment.

Lipodystrophy continues to lack a working definition but there is consensus that this phenomenon includes: fat accumulation in the breast and/or the dorsocervical region and/or the intra-abdominal cavity and/or in discrete lipomas; fat loss (lipoatrophy) involving the face and/or the periphery; or both; and veins may be prominent on legs and arms. Serum lipid changes also occur and may include; an increase in cholesterol, decreased HDL (plasma high-density lipoprotein), increased cholesterol/HDL ratio and an increase in triglycerides. Insulin resistance, diabetes mellitus and more recently bone metabolic abnormalities have also been associated with lipodystrophy (Shattuck, 2001, Martinez *et al.* 2001, Holstein *et al.* 2001). Other side effects of antiretroviral treatment include diarrhoea, fatigue, headache, nausea, mitochondrial toxicity, liver disease and kidney stones. Measurement of lipodystrophy is by patient or physician identification (Cofrancesco & Barnett 2000).

As discussed above there are morphological and metabolic changes associated with HIV illness, lipodystrophy and antiretroviral therapy. Epidemiological evidence suggests hyperlipidemia and cardiovascular disease are associated with insulin resistance. Antiretroviral therapies are also associated with hyperlipidemia, central obesity and insulin resistance and, therefore, increase the risk of coronary artery disease in people with HIV (Samaras *et al.* 1999). Abdominal (visceral) obesity is also well documented as a predisposing factor in relation to cardiovascular disease and insulin resistance is often found in association with abdominal obesity (Buemann & Tremblay 1996).

Other physical problems associated with antiretroviral therapy include, gastrointestinal effects, fatigue, headache, liver disease and kidney stones (Shattuck 2001). Wasting in HIV illness is still a problem even with the introduction of antiretroviral treatments. Polsky *et al.* in 2001 argued it might be difficult to distinguish between wasting and HIV positive people who present with lipoatrophy. They also identified that a decrease in lean mass is associated with wasting but increased visceral and dorsocervical fat is related to lipodystrophy.

Mulligan (1999) discussed wasting in HIV positive people as having a negative effect upon their survival and quality of life. The current management for wasting includes appetite stimulants, cytokine suppressors, protein anabolic agents and

progressive resistance exercise. Shattuck (2001) argued there is an important role for nutrition therapy in relation to improved quality of life for HIV positive people and the management of antiretroviral therapy. Side effects of these medications including the effects of lipodystrophy are reduced.

### **Dietary Intervention**

Only a few studies have evaluated the effectiveness of a dietary intervention in relation to improving weight in HIV positive people and only some of these have proven effective in showing a significant change in body weight. Kotler (2000: 582) stated, 'Regardless of the underlying mechanism, weight loss ultimately is a consequence of negative caloric balance, so that expenditure must exceed intake (or absorption).'

In past randomised control trials evaluating weight loss and dietary interventions, no significant change in weight was found from baseline. This occurred in the study by Rabeneck *et al.* (1998), which compared nutrition counselling with or without oral supplementation in a group of HIV positive people who had lost weight. The results were similar in the study by Swenk *et al.* (1999), which examined whether dietary counselling increased intake with or without oral supplements in a group of malnourished HIV positive people. Melchior *et al.* (1996) in a controlled, randomised, prospective trial were successful in increasing weight by using parenteral nutrition compared with dietary counselling in a group of people with AIDS. Studies by Kotler *et al.* (1990) and Kotler *et al.* (1998) showed no significant increase in body cell mass in people with AIDS and malabsorption who received parenteral nutrition, but attributed weight gain to an increase in fat mass in these people. A prospective study examining the effect of dietary counselling upon dietary intake and weight and body composition on HIV positive people by Dowling *et al.* (1990) found no significant change in body composition even though nutritional intake increased. A prospective cohort study by Chlebowski *et al.* (1995) examined the effects of dietary counselling on dietary intake and weight maintenance in a group of people with HIV and found weight decreased even though energy intake was sufficient. The participants from these studies had HIV but lipodystrophy was

not specified. Quality of life issues and subjective data were not examined in any of these studies.

Three studies have investigated the effects of diet upon people with HIV and lipodystrophy. Moyle *et al.* (2001) undertook a randomised open label comparative trial comparing diet to diet and pravastatin and reported reduced cholesterol in the participants in both groups. Another study by Roubenoff *et al.* (1999) recommended diet as well as exercise should be studied for this population. Nutritional interventions have also been recommended as an early intervention for HIV infection to manage ongoing nutritional status (Currier *et al.* 2001). Interestingly, there are few studies available to guide nursing practice and antiretroviral-related nutritional problems (Keithly & Fields-Gardner 2001).

At present some health services in Australia providing care for HIV positive people lack government funded specialist dietician services. Rather, dietician services in some of these settings are currently funded through other sources such as donations from pharmaceutical companies.

Whilst weight loss has been a clinical manifestation of HIV illness since the beginning of the epidemic it is also known to lead to an increased risk of opportunistic infections in HIV positive people (Polsky *et al.* 2001). The Impact of Weight Loss Scale has been used previously to assess perceived weight loss and how this impacts upon body image, behaviour and affect. The questionnaire is for use with individuals who are prone to involuntary weight loss and measurement is reciprocal with greater depression, reduced quality of life, objective nutritional deficits and amount of weight loss and was used to measure perceived weight loss in the present study (Wagner & Rabkin 1999).

Coping may be defined as 'cognitive and behavioural efforts to manage specific external and/or internal demands appraised as taxing or exceeding the resources of the individual' (Folkman & Lazarus, 1988: 6). Coping behaviours are an example of factors that limit the effects of psychological distress and are described as either 'problem focused (changing the source of stress) or emotion focused (regulating stressful emotions)' (Fleishman & Fogel, 1994: 156). Folkman and Lazarus (1980)

identified that emotion-focussed coping was more likely to be related to health problems appraised as uncontrollable and was also related to poorer adjustment to illness. Namir *et al.* (1987) suggested that an active behavioural coping style is related to improved emotional adjustment to AIDS.

‘The Ways of Coping Questionnaire is designed to identify the thoughts and actions an individual has used to cope with a specific stressful encounter’ (Folkman & Lazarus 1988: 5). Mulder *et al.*(1995) discussed the association of active confrontive coping and disease progression and Gifford *et al.* (1998) discussed the importance of teaching people with HIV more effective coping strategies. In the present study, the questionnaire identifies changes in coping strategies used by people with HIV and lipodystrophy following dietary intervention to manage their HIV illness and the side effects of the antiretroviral medication.

### **Purpose**

The purpose of this research study was to evaluate the effects of a diet intervention upon the quality of life of people living with HIV and lipodystrophy. To achieve this purpose the following objectives were developed:

1. Measure the perceived impact of weight loss upon men with HIV and lipodystrophy following a diet intervention;
2. Identify strategies used by men to cope with HIV and lipodystrophy following a diet intervention;

### **Research questions**

To achieve the purpose of this study, the following research questions were examined:

1. Is there a difference in perception of weight loss for men living with HIV and lipodystrophy following the implementation of a diet program?

2. Is there a difference in the coping processes of men living with HIV and lipodystrophy following the implementation of a diet program?

Based on the research questions, the following hypotheses were developed.

- The average scores of perceived weight loss of the participants in the diet program over ten weeks will be significantly improved compared to the average scores of those who did not participate as measured by the Impact of Weight Loss Scale.
- The average scores of the ways of coping of the participants in the diet program will be significantly improved over ten weeks compared to the average scores of those who did not participate as measured by the Ways of Coping Questionnaire.

## **METHODS**

### **Design**

An experimental design incorporating pretests and posttests of experimental and control groups was used in the study.

### **Participants**

The population for this study consisted of 30 men living with HIV and lipodystrophy who were clients from two medical sites in Brisbane. These two medical sites were chosen because the medical staff at these centres managed people with HIV and are prescribers of antiretroviral medication. The dietician who attended to the participants in the present study also managed clients at these two centres.

A poster was used at the two centres to assist in recruitment of men who identified or believed to be eligible to participate in the project. Clients who expressed verbal interest in participating were assessed by the medical or nursing staff on presentation for consultation and were given the participant's information sheet and statement of

consent. To be eligible for this study, the participants had to meet the following entry criteria. They had to be male and over 18 years of age; be HIV positive; have a diagnosis of lipodystrophy and be presently taking antiretroviral medication at the time of this study; not already be participating in a prescribed diet program for the past three months; and receive medical approval and consent to participate. Measurement of lipodystrophy was by patient and physician identification. Eligible participants who had given written consent were randomly allocated into either the intervention or the control group. A computerised random-number generator was used to identify the allocation of numbers to the intervention and control groups. The names of the participants and the identified numbers were placed in two separate boxes. The Administration Officer and the Principal Investigator then pulled names and numbers from the boxes and placed them into the allocated groups.

### **Sample Size**

Sample size calculations were based on a significance level of  $p = 0.05$  (two-tailed). The sample size was  $n = 15$  per group. For the Impact of Weight Loss Scale which ranges from 9 - 36, the suspected range of change was  $\pm 5$  for a standard deviation of change of about 3. With 15 per group, it was deemed possible to detect differences of 3.7 score units or more between control and intervention groups (with 90% power and  $p = 0.05$  two tailed).

For a power of 90% at the  $p = 0.05$  (two-tailed) level of significance, with respect to the coping style subscales, it was expected to be able to detect the following changes (in scale scores) of the following magnitude; confrontive coping 2.57, distancing 2.19, self-controlling 3.53, seeking social support 2.59, accepting responsibility 1.77, escape-avoidance 3.05, planful problem solving 2.89 and positive reappraisal 3.64 based on standard deviations derived from (Folkman *et al.* 1986).

### **Instruments**

To investigate the variables of interest, two areas were examined in detail: perceived weight loss and ways of coping. To examine perceived weight loss the Impact of

Weight Loss Scale was used. The ways of coping was examined using the Ways of Coping Questionnaire.

### **Impact of Weight Loss Scale**

The Impact of Weight Loss Scale is 'a subjective measure of perceived weight loss and related behaviour, body image perception and affect, as well as the scale's relationship to mental health and nutritional measures in an HIV sample' (Wagner & Rabkin 1999:453). There are nine items to this scale. The scale measures perceived weight loss and related behaviour, body image perception and affect. Each item is rated on a four-point scale of 1-4. The lower end of the scale (in the present study) 1 (strongly agree) displays increased concerns about 'weight loss and its impact on body image, behaviour and affect' (Wagner & Rabkin 1999: 454). The scale score is the mean item score. The mean Alpha for the scale in this study is 0.91. This scale is used 'as a screening tool for body image disturbance and associated affect and behaviour resulting from weight loss' (Wagner & Rabkin 1999: 454). Possible total scores range from 9–36.

### **Ways of Coping Questionnaire**

The Ways of Coping Questionnaire is a 66 item self report questionnaire which identifies coping strategies that people use in the management of internal and external demands in specific stressful situations. 'Coping, when considered as a process, is characterized by dynamics and changes that are a function of continuous appraisals of the shifting person-environment relationship' (Folkman *et al.* 1988: 6)

The questionnaire assesses how people react to stressful events in their lives and contains items that describe cognitive and behavioural strategies in the management of specific stressful encounters. There are eight scales to this questionnaire and each question is rated on a four point likert scale. At the high end of the scale, scores of 3 indicate what strategies are used a great deal, at the low end of the scale scores of 0 reflect does not apply or not used (Folkman & Lazarus 1988). Possible total scores range from 0 to 150. The mean alpha for each item in the present study is: Confrontive Coping 0.80, Distancing 0.81, Self-Controlling 0.79, Seeking Social

Support 0.86, Accepting Responsibility 0.80, Escape-Avoidance 0.82, Planful Problem Solving 0.77, Positive reappraisal 0.78. The mean alpha for the whole instrument was 0.83.

### **Intervention Programme**

Pre and post-tests were conducted to test the diet program. The intervention group undertook the diet program, which consisted of four visits to the dietician over a ten week period. The initial consultation and assessment was conducted on the first visit, followed by follow up visits at two weeks, at six weeks and another visit at ten weeks and to provide support to the participants and monitor implementation of the program. The intervention group also received an information booklet about diet at the commencement of the program, whereas the control group received the diet program and information booklet at the end of the study. There was only one dietician involved in delivering the intervention.

The dietician initiated behavioural therapy in this study. Clients learnt self-management skills that are able to be used in everyday life. The behavioural therapy process meets the individual needs of the client. In this study the client's current problems and the reasons they occurred were focussed upon, recorded and assessed continually throughout the program. Treatment goals and objectives were also specified and recorded.

Motivational interviewing techniques described by Rollnick *et al.* (1999) were also used by the dietician. Each client's expectations of the costs and benefits of the changes they were making and confidence in their ability to achieve their goals were measured at each visit by the dietician. The intervention was then developed around the issues where an impact was most likely to occur.

### **Procedure of Data Collection**

Prior to commencement, the participants were fully informed about the research study verbally, given a written plain language information statement and asked to provide written consent. The questionnaires were administered by the same person before the program started and again upon completion of the ten week program. Ethical approval was obtained from The Prince Charles Hospital Health Service District Ethics Committee and Queensland University of Technology Ethics Committee. The participants were given information about the study through information sheets and written consent was obtained from each participant.

### **Data analysis**

Although the participants in both groups were similar in relation to the demographic and health related variables, an Analysis-of-Covariance (ANCOVA) was undertaken to examine the hypotheses developed for the study. The ANCOVA design is a statistical technique used to control any initial differences in the participants which may have been present and which may confound differences between the two groups of participants (Tabachnick & Fidell 1996).

A series of one-way between groups ANCOVA's were performed on Time 2 scores of Impact of Weight Loss and Ways of Coping Questionnaire. Time 1 scores of the respective dependent variables were used as a covariate to control for Time 1 initial differences between the groups. Four other covariates were included: age, number of months on antiretroviral therapy, years of education and number of years HIV positive.

Range and consistency checks for each item or each questionnaire were conducted after data collection. To minimise potential data entry error, the same person entered the data.

Data analysis was undertaken using the Statistical Package for the Social Sciences (SPSS version 10, in SPSS Inc., 1999). Computer analysis of frequencies of each value of each variable was performed as a check of the accuracy of the data entry. The initial process for examining the data aimed to check for errors in coding and

identify important information in the data that may influence the subsequent choice of data analysis method.

Based on the design and the purpose of the study, a one-way analysis of variance was performed to determine any differences between the two groups in terms of age, years of antiretroviral therapy, years of education and years HIV positive. Before the statistical analysis was conducted, the assumptions underlying the statistical methods, One-way Analysis of Covariance (ANCOVA) were also checked. Statistical significance was reported at the conventional p-value of equal to or less than 0.05 level (two-tailed).

Descriptive analyses were used to examine demographic variables, the length of time participants were taking antiretroviral therapy, the length of time the participants had been HIV positive and the number of years of education of the participants. The mean and standard deviation for continuous variables were calculated.

## **RESULTS**

### **Characteristics of participants**

The participants were similar in relation to demographic and health related variables, which included age, years HIV positive, years of education and months of antiretroviral therapy. Any effect these variables had upon the results of the study has been controlled for in the analyses undertaken to examine the hypotheses developed for the study.

### **Impact of Weight Loss**

A one-way between groups ANCOVA was performed to examine if the intervention affected Time 2 impact of weight loss scores using Time 1 impact of weight loss scores as a covariate. Inspection of means revealed the intervention group reported more positive feelings about weight loss than did the control group. A second

ANCOVA was performed to control for the four other possible confounding variables: age, months of antiretroviral therapy, years of education and years HIV positive, in addition to Time 1 impact of weight loss scores. This did not change the scores.

### **Ways of Coping**

A one-way between groups ANCOVA was performed to examine if the intervention affected Time 2 of the coping subscale scores (confrontive, distancing self-controlling seeking social support, accepting responsibility, escape avoidance, planful problem-solving and positive reappraisal) using Time 1 scores as a covariate. A second ANCOVA was performed to control for the four other possible confounding variables: age, months of antiretroviral therapy, years of education and years HIV positive, in addition to Time 1 coping subscale scores. The scores indicate that although not significant the intervention group changed more than did the control group.

## **DISCUSSION**

At the completion of the study 93.3% of participants remained in the intervention and the control groups. The participants in both groups (intervention and control) were relatively homogenous. The age of the participants ranged between 28 to 65 years and the greater proportion were single (20) and homosexual (22). This reflects national trends with most people with HIV being male and homosexual (National Centre in HIV Epidemiology and Clinical Research, 2002). A study by Brown & Batterham in 2001 found the majority of people in their study had been HIV positive for more than ten years which is a result of antiretroviral therapy improving HIV disease outcomes and associated long-term survival. Ethnicity was not included in the analysis, as there was only one indigenous person in the participant groups. All of the participants at the time of recruitment were able to continue with normal activities as measured by the Karnofsky Performance Status scale. Only 5 participants had previously had an AIDS defining illness and were currently stable. A

study by Keithley *et al.* in 1992 reported no differences in quality of life scores between asymptomatic HIV positive people; those with AIDS related conditions; or those with stable AIDS.

Men were chosen for this study as different patterns of morphologic and metabolic abnormalities have been shown to occur in males and females with lipodystrophy as reported in a study by Muurahainen *et al.* in 2000.

The Impact of Weight Loss Scale developed by Wagner & Rabkin in 1999, was used in this study to identify the relationship with weight loss and its impact on behaviour, body image and affect on people living with HIV and lipodystrophy. It was also used to identify future treatment needs and as a measure of the effect of current treatment on the participants (Wagner & Rabkin 1999). This scale has not been used in any previous studies except that by Wagner & Rabkin in 1999.

The participants in the present study presented with fat accumulation, fat loss and a combination of both. Although the sample used in the study by Wagner & Rabkin in 1999 were HIV positive men who had significant weight loss, they did not state whether the participants were taking antiretroviral therapy nor whether they had lipodystrophy. The intervention group of the present study showed significantly improved perception of weight status.

A study by Folkman *et al.* (1986b) reported that varied coping options maybe used according to people's situational appraisal of control. They found a significant relationship between coping and the two major primary appraisal indices, threat to self esteem and a threat to a loved one's wellbeing. Folkman *et al.* (1988) reported that if outcomes are identified as changeable then problem focussed coping (confrontive coping and planful problem solving) maybe used more, whereas if encounters are appraised as having to be accepted, emotion-focussed coping strategies (distancing, self controlling, seeking social support, escape avoidance, accepting responsibility and positive reappraisal) are more often used. Although not significant the intervention group used confrontive coping more at Time 2 than did the control group.

A report by Batterham *et al.* in 2001 suggested that body composition changes associated with lipodystrophy have a negative effect upon a person's self esteem. Another study by Siegal *et al.* in 1997 identified that escape avoidance, accepting responsibility and self controlling strategies are more associated with negative emotions. The participants in the present study identified their own stressful encounter in relation to HIV and lipodystrophy at Time 1 and Time 2. Whilst there was no significant change observed to any of the scales of the Ways of Coping Questionnaire, all coping processes were used more by both the intervention and the control groups at Time 2. Confrontive coping, distancing, escape-avoidance and seeking social support were used more in both groups particularly the intervention group and self controlling was used more by the control group. In this study both the intervention group and the control group used emotion focussed coping processes more at Time 2. Folkman *et al.* (1980) found that emotion-focussed coping was more likely to be used for health problems which are not amenable to change.

Some of the symptoms of the HIV illness and the side effects associated with antiretroviral therapy (such as lipodystrophy) are not always reversible and this is possibly being reflected in the results. A report by Martinez *et al.* in 2001 also indicated that subcutaneous fat loss may not always be reversible and did not change for some of the participants in this study. Therefore, a diet intervention may have influenced the way the participants in the intervention group appraised and reappraised their stressful encounter in relation to lipodystrophy.

The participants in the present study related stressful encounters about HIV and/or lipodystrophy to the ways in which they coped. The different results suggest the participants used different coping efforts at Time 1 and Time 2 to manage changes in the person–environment relationship. This is consistent with the report by Folkman *et al.* (1986b) which identified that both problem focussed and emotion focussed coping are used in every stressful encounter. The individual's thoughts and actions change as a result of the appraisal and reappraisal of the shifting person-environment relationship.

There have been no other randomised control trials, which have used the Ways of Coping Questionnaire in relation to diet and HIV.

## **Limitations**

A small sample size compared to the national numbers of people living with HIV and lipodystrophy was used in this study so findings only represent populations of similar characteristics. A separate study for women would have to be conducted because of the differences in presentation of lipodystrophy between the populations.

The instruments used in this study have been proven to have a high reliability and validity in previous studies however these studies involved larger populations. It is therefore difficult to ascertain whether or not there was an effect for this study.

Also actual weight was not measured in this study.

## **CONCLUSION**

The results of this study indicated that the diet program was generally found to be acceptable and feasible in this study population. The perceived weight loss of the participants significantly improved after a ten-week diet intervention compared to the control group at the same time. Weight loss in HIV disease and for people with lipodystrophy can be severe and distressing and diet is recommended as a management option.

The average scores of the ways of coping questionnaire of the intervention group were not significantly improved over ten weeks compared to the control group although it was shown that the participants in both groups used all types of coping processes more at Time 2. This is because individuals' thoughts and actions change as a result of the shifting person- environment relationship.

## **Implications for Further practice**

The findings showed that perceived weight loss improved in this group of people. Perceived weight loss is associated with the side effects of antiretroviral treatment

for HIV as it results in the reluctance of people to commence treatment or people stop taking their medication. This places them at risk of disease progression. A routine dietary intervention should be offered for all people with HIV who are intending to commence antiretroviral treatment. Health professionals including nurses in community health centres need to be active in assessing the needs for people with HIV who are currently taking or about to commence antiretroviral treatments.

A replication of this study is recommended with larger number of participants to evaluate whether the changes that occurred are generalisable to the whole of this population.

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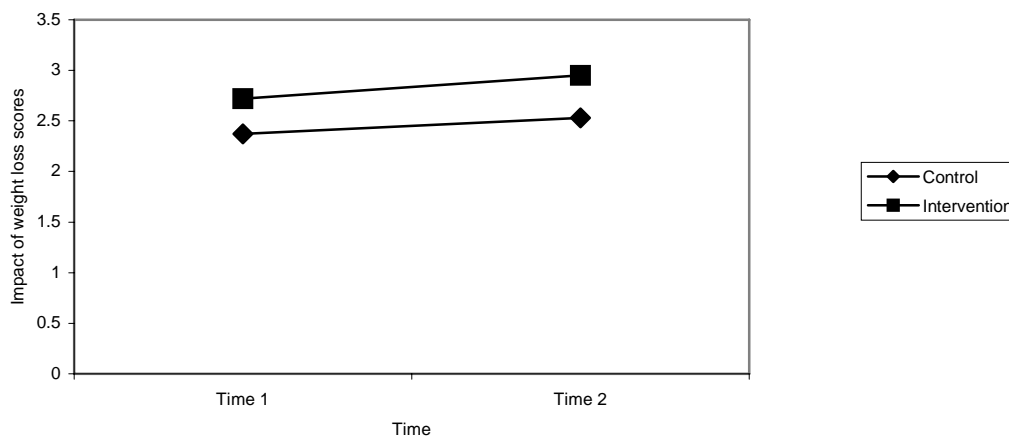
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**Table 1. Unadjusted and adjusted means and standard deviations (sd) of impact of weight loss scale**

Impact of Weight Loss	Unadjusted T1	Unadjusted T2	Adjusted T2 with T1 covariate	Adjusted T2 with all covariates	p
Intervention	2.72(.70)	3.10(.68)	2.97	2.95	0.04
Control	2.37(.85)	2.38(.75)	2.50	2.53	

**Note: SD's not available for adjusted marginal means. Higher scores represent less problems.**

Figure 1 Plot of mean impact of weight loss scores for intervention and control groups at T1 and T2 (adjusted for all covariates)



**Table 2. Descriptive statistics: means, standard deviations (sd)**

	Intervention	Control	t	p
	Mean	Mean		
Age in years	45.79(9.94)	48.21(8.59)	0.69	0.59
Months of Antiretroviral Therapy	51.21(15.29)	47.71(25.99)	0.43	0.11
Years of Education	13.86(4.24)	12.14(2.91)	1.25	0.08
Years HIV Positive	10.93(4.21)	9.86(4.07)	0.68	0.94

**Table 3. Unadjusted and adjusted means and standard deviation(sd) of coping**

<b>Confrontive Coping</b>	<b>Unadjusted T1</b>	Unadjusted T2	Adjusted T2 with T1 Covariate	Adjusted T2 with all covariates	p
Intervention	3.79(2.72)	5.57(2.65)	5.75	5.65	0.90
Control	4.71(3.15)	5.57(3.65)	5.39	5.49	
<b>Distancing</b>					
Intervention	4.79(3.19)	5.71(3.20)	5.98	6.08	0.97
Control	5.86(3.21)	6.50(3.94)	6.23	6.13	
<b>Self Controlling</b>					
Intervention	8.64(4.40)	9.00(4.00)	8.80	9.09	0.56
Control	7.93 (4.29)	10.14(4.88)	10.34	10.06	
<b>Seeking Social Support</b>					
Intervention	7.00(3.51)	8.50(4.52)	8.51	8.35	0.75
Control	7.07(4.09)	7.64(4.78)	7.63	7.79	
<b>Accepting Responsibility</b>					
Intervention	2.79(2.75)	3.00(2.75)	2.92	3.11	0.89
Control	2.43(2.53)	3.07(2.92)	3.16	2.96	
<b>Escape-Avoidance</b>					
Intervention	4.64(3.56)	6.29(4.60)	6.87	6.76	0.62
Control	5.79(3.62)	8.07(5.88)	7.49	7.59	
<b>Planful Problem Solving</b>					
Intervention	7.29(3.43)	8.21(4.48)	8.28	8.20	0.91
Control	7.50(5.42)	8.36(4.65)	8.30	8.38	
<b>Positive Reappraisal</b>					
Intervention	5.79(3.77)	7.29(5.54)	7.32	7.28	0.88
Control	5.86(3.51)	7.00(5.57)	7.00	7.01	

**Note: SD's not available for adjusted marginal means. Higher scores reflects higher use of coping.**