



**YORKSHIRE YOGA & THERAPY CENTRE**

**Independent Report  
to the Yorkshire Yoga Centre  
on the yoga for weight control pilot study  
21 September 2006**

**By Dr Sara Kirk and Diana Camidge  
(from the Nutrition and Epidemiology Group  
Centre of Epidemiology and Biostatistics  
University of Leeds)**



THE BRITISH WHEEL OF  
**YOGA**  
APPROVED REGIONAL CENTRE

Yorkshire Yoga  
Registered No. 5368620  
Not-for-Profit Company Limited by Guarantee with Registered Office at  
9-10 Halfpenny Close \* Knaresborough \* Harrogate \* HG5 0TG  
Tel: 01423 864343 \* E-mail: [info@yorkshireyoga.co.uk](mailto:info@yorkshireyoga.co.uk) \* Website: [www.yorkshireyoga.co.uk](http://www.yorkshireyoga.co.uk)

**Independent Report to the Yorkshire Yoga Centre  
on the yoga for weight control pilot study  
21 September 2006**

**By Dr Sara Kirk and Diana Camidge**

**Background**

This report describes the results of a small-scale pilot study of whether yoga sessions could be an acceptable method of weight loss. The information presented in this report is from a process evaluation designed to explore the views of participants undertaking the yoga for weight control sessions and the views of a control group who did not receive the sessions. Information on weight and dietary changes is also presented but the reader should be aware that there were only a small number of participants in this pilot study. Therefore, firm conclusions on the effectiveness of yoga for promoting weight loss cannot be made from this information.

**Methods**

Participants for this pilot study were recruited via advertisements in the local press in the Harrogate area. Potential participants were encouraged to contact the Yorkshire Yoga Centre (YYC) for further information about the study. They were then sent details of the pilot study, a baseline questionnaire and three day food diary to complete, and the dates on which Yoga for Weight Control (YWC) sessions were to be run, and were invited to attend an information session. At this session potential participants were weighed and measured, then randomly allocated to either the intervention group or the control group. Intervention participants received free yoga for weight control sessions, combined with weight management advice, while control participants received weight management advice, and were put on a waiting list to receive yoga for weight control sessions at a later date, once the pilot study was completed. The sessions were conducted on a weekly basis over 20 weeks. Participants from both groups were weighed again at the end of the project and completed a second questionnaire and three day food diary. Participants were asked for a detailed breakdown of their diet over three days, to include a weekend day when diets will often change due to social functions or a change in lifestyle. The types and amounts of food and drink consumed were recorded as well as the time they were eaten. Homemade meals, recipes and portion sizes were requested to be written out and submitted with the diary. Participants were encouraged to complete the diary as they consumed the food and drink rather than retrospectively. A short questionnaire at the end of the diary confirmed and reminded participants of habitual diet choices such as the type of milk used, brand of margarine or how much sugar taken in hot drinks. Focus groups were also

conducted at the start and end of the project to obtain views of participants from both the intervention and control group about their weight loss experiences and views about the project.

### ***Details of the intervention***

Each weekly session began with a 'weigh-in' for both the control group and the intervention group. A Tanita TBF-310 GS body composition analyser was used for measuring weight, body mass index (BMI - a measure of body weight that takes account of height). Both groups were present for a talk on healthy eating. Dietary advice was based on low GI principles, with high fibre, low calorie, low fat and low cholesterol foods promoted, with a recommended intake of approximately 1500 kcal per day. Participants were also encouraged to make and consume unlimited quantities of "meditation soup". All participants were given handbooks on healthy eating and goal-setting with a section where they could keep a daily journal of what they ate, what exercise they performed and how they felt each day. Participants were encouraged to share their success stories and frustrations, to practise their exercises at home and to explore other forms of physical activity throughout the week. The control group then left and the yoga for weight control class began.

The yoga for weight control session began with a short relaxation, either lying down or sitting in a chair. Yoga warm-up stretches were synchronised with breathing techniques, bringing body and mind into harmony. Core stability and strengthening exercises were included amongst the gentle yoga sequences. Several participants with higher body weights could not easily get down on to yoga mats, so the exercises were modified so that they could practise them from a chair. Breathing exercises were then taught which calmed the nervous system and brought the mind to a quiet place. Sometimes, breathing and meditation sessions were conducted in a circle so that students could become more experientially aware that yoga means 'union', not only the union of body, mind spirit within each person, but also a union with other people and the universe. The session concluded with a 15-20 minute final relaxation called Yoga Nidra (which means 'yoga sleep', only it is important to stay awake and be conscious of the instructions). During this restful relaxation period, each student repeated a mental resolve/affirmation three times at the beginning of the relaxation and three times at the end. The positive affirmation was something that individuals chose for themselves and could keep private. Some shared their 'resolves' with others. Resolves were either simple statements (e.g. "I take care of myself. I deserve it," "Optimum health is my first priority") or more spiritual reflections dependent upon personal background. For many, the affirmations became a daily practice, repeated several times.

Statistical analysis was conducted on weight and BMI data collected and a result was considered to be statistically significant (i.e. unlikely to have occurred by chance) if the p value was found to be less than 5% (written as  $p < 0.05$ ). Focus groups were taped, fully transcribed, then analysed for themes. Quotes used in this report are direct quotes, written as spoken and therefore not necessarily grammatically correct (sic). Food diaries were analysed using a customised dietary analysis package.

## **Results**

### ***Response rates***

There were 42 volunteers on whom baseline measures were taken. Of these 22 were randomised into the intervention group and 20 into the wait-list control group (i.e. these participants received the yoga sessions after the project was completed). Four intervention participants dropped out over the course of the project. One control participant became pregnant during the project and was therefore excluded and two others dropped out. Therefore at the end of the intervention period there were 18 intervention participants and 17 control participants, a response rate of 82% for the intervention group and 85% for the intervention and control groups respectively. There were 20 sets of completed food diaries available for analysis; 13 from the Intervention Group and seven from the Control Group.

### ***Characteristics of the sample***

All participants were women. The mean age of the control group was 49 years, while the mean age of the intervention group was 52 years. This difference was not significant. The age range was broad, from 20 years to 73 years. Two participants in each group were within a normal range for BMI (less than 25kg/m<sup>2</sup>), eight participants in the control group and 10 in the intervention group were in the overweight range for BMI (25-30kg/m<sup>2</sup>), five participants in the control group and six in the intervention group were in the obese range (30-40kg/m<sup>2</sup>) and two control participants and three intervention participants were in the very obese range (BMI over 40kg/m<sup>2</sup>).

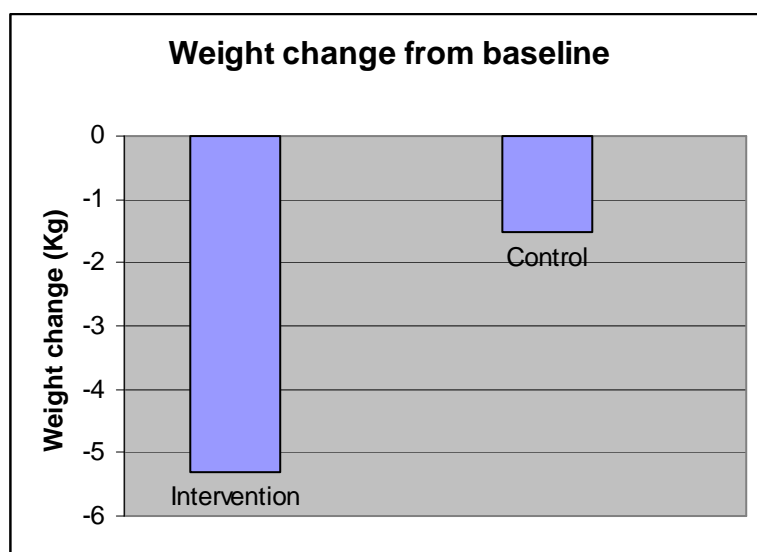
### ***Weight loss***

Figure 1 shows the mean weight change post-intervention for both groups. From this it can be seen that both groups lost weight over the course of the project from baseline. Using information from people who completed the study (i.e. we have information from both baseline and post-intervention, usually called responders), the mean weight change for the control group was -1.6kg, while for the intervention group the mean weight change was -5.3kg. This difference was significant ( $p < 0.05$ ). However, there were three people in the intervention group

and two people in the control group who lost large amounts of weight (known as outliers). The most extreme outlier in the intervention group lost 17.7kg, while the most extreme outlier in the control group lost 10.4kg. When these two people were excluded, the difference in mean weight change between the groups was no longer significant.

To determine the impact of drop-outs on weight loss, a sensitivity analysis was also performed using a technique known as “baseline observation carried forward” (BOCF). In other words, information from participants who dropped out can be included in the analysis by assuming that they did not lose weight, therefore their post-intervention weight was considered to be the same as their baseline weight. The mean difference in weight between the two groups in this analysis was smaller but remained significant (mean difference between groups = 2.9kg;  $p < 0.05$ ). When the analysis was repeated using BMI, which takes account of variations in height as well as weight, the mean difference between the groups for responders was smaller but still significant (mean difference = 1.16;  $p < 0.05$ ). However, when taking account of drop-out, the difference in BMI was no longer significant.

**Figure 1: weight change baseline to post-intervention**



### **Changes in dietary intake**

In terms of changes in dietary intake from baseline and post intervention, both groups made similar changes, in line with current dietary recommendations. There was a 34% reduction in fat intake from baseline for the intervention group and a 44% reduction from baseline for the

control group. For energy intake, there was a 28% reduction from baseline for both groups, with energy intakes on average of just over 1500 kcals at the end of the intervention. For sucrose (sugar), the intervention group reported a 26% reduction in consumption, while the control group reported a 17% increase in consumption. In contrast, the control group reported a 39% decrease in cholesterol intake, compared with a 11% decrease in cholesterol intake in the intervention group. Both groups reported a slight increase in fibre intake of 3%. In terms of weight loss, 12 out of 13 intervention participants who completed food diaries at both time points lost weight, along with five out of the seven control group participants.

### ***Views of participants at baseline***

Prior to the start of the project, 22 participants attended focus groups to explore their views of weight loss in general and the project in particular. At the time of attending the focus groups none of the participants had been told of their group allocation. All those attending the focus groups had attempted to lose weight before, using a range of other resources including commercial slimming clubs, books and magazines. The majority could be described as yo-yo dieters, i.e. they had tried to lose weight before and had a history of weight loss and gain. The following comment illustrates this:

*“My worry is that every time I did lose weight, that I’d go back to what it normally was, then I’d put more on that I lost”.*

The reasons given for putting on weight included having children, suffering health problems such as arthritis that affected their mobility, getting older, comfort eating (related to mood swings), lifestyle, cooking for the family and stopping smoking.

One participant observed:

*“I think half of my trouble is going in the kitchen and picking, what I don’t eat at a meal doesn’t really count”.*

Another said:

*“Oh I’ve done them all, I’ve got every diet book known to man in my house you know from the fad diets to the sensible ones, every time somebody brings out a new one I buy the book, I read it whilst eating a large cake...”*

Another participant found that:

*“When I had the children I started putting on weight and because of the type of job I do, I sit a lot”.*

A number of participants had tried yoga before. Participants had some preconceptions about yoga, with concerns that they would not be able to do either the exercises or the relaxation. However they also believed that yoga would de-stress them and help them to avoid triggers for overeating:

*“I really don’t want to do meditation, I don’t want to get into that side of it, I want the exercise part of it”.*

*“I personally have never done yoga and I’m just totally interested into how it works, I don’t know much about it at all”.*

*“It’s always appealed to me but I’ve never been to a yoga class ever”.*

*“I tend to think that maybe yoga maybe de-stresses you a bit so that when you have done that you don’t feel the need to go and raid the fridge”.*

Interestingly, few people had connected yoga to weight loss:

*“I’ve never thought of yoga as being connected with weight loss, I’ve more looked on it as being relaxation perhaps sort of de-stressing things rather than being connected with weight, I think I’ll benefit from both things from the relaxation, help you sleep better and hopefully will help me lose half a stone”.*

*“It would be interesting to see what actually happens because at the moment I can’t quite see how yoga would help you lose weight”.*

### ***Views of participants post-intervention***

Focus groups were repeated at the end of the project with 16 participants, 12 from the intervention group and four from the control group. The findings of the intervention focus groups will be considered first.

*Views on the yoga component.*

Participants described the yoga component of the sessions as relaxing, calm and allowing them to feel good about themselves. They felt that it toned their bodies and improved their posture and overall were very positive about the experience. Most participants enjoyed the relaxation, and indeed a few had felt so relaxed they fell asleep:

*“Yes it’s quite stressful trying to stay awake!”*

*“It was quite amazing actually because I...the voice was saying ‘you will listen’ and the next thing is ‘where did I go?’”*

*“I think that’s it because you become aware of your body as well, you know, you relax your shoulders, your hands”.*

Intervention participants were also asked to decide on an affirmation, which was a positive resolve that they wanted to achieve in their life. They were encouraged to say this daily or as often as they needed. There were mixed feelings towards the affirmation. One participant had felt quite negative at the beginning:

*“I think the affirmation for me was quite difficult I don’t think I got to grips with that at all. I think just because I don’t believe them, I just didn’t actually think that was going to be actually relevant but I think in the first few weeks and I looked round people were really losing weight, you knew that they had really taken it on board. I didn’t get to grips with it until later on and by that time I realised that it was working. I then did start losing weight. At one stage I was losing 0.4 of a pound every week and it was adding up but it was adding up slowly”.*

Another spoke of how the affirmation became part of her life:

*“You just sort of practise it quietly I think everyday, you don’t notice that you’re doing it”.*

*Views on the Diet and weight loss.*

Views on the diet were positive overall although a few had found it hard to follow:

*“I found it quite hard actually, I probably would have lost more if I’d stuck to it more rigidly”*

Participants felt that they were able to change their eating habits, eat more healthily and fit their new eating habits into their life. However, sometimes this was undermined by family members. One participant described the following scenario involving her husband, who incidentally also lost weight:

*“If I had healthy meals sort of five nights in a row, by the end of the fifth night he wanted a meat pie. He’s a typical northern man”.*

Another participant described the effect of the change in family eating habits on her husband, who was very supportive:

*“My husband lost weight, a stone and a half ... he was doing it to encourage me, because he knows the health issues I face”*

Participants enjoyed making the meditation soup because they were encouraged to make it under yogic conditions - relaxed and calm and made with ‘love’. A few had little rituals they did before making the soup, such as having to wear the right apron, or listen to the right music. One participant said:

*“It’s really good actually that meditation soup, I mean the kids love it, oh yes”.*

Participants were on the whole pleased with the weight they had lost and for some this was the first time they had managed to lose weight consistently:

*“I’ve been to slimming clubs and not lost anything, you lose it in the first couple of weeks and then it all creeps back on. But this has been 20 weeks and the weight has been lost, it hasn’t been so dramatic, its just been gentle”.*

### *Views on the group setting*

Most of the participants enjoyed the group setting, and there was a sense that they bonded well, and gained a lot from the support from other participants:

*“One of the things about the group, most people did consistently lose weight, people were constantly at least trying whereas if you go to any other group, there’s a handful of people that are really going for it and everybody else is just wasting their money”.*

However, a few participants expressed hesitation at continuing with the sessions, typified by this comment:

*“I can’t do with the commitment of going every week because I force myself to go even if I’m not well”*

The influence of the group tutor was another important factor to the intervention participants. The group related to her and found her to be supportive and encouraging. One made the following observation:

*“I think she’s a very good teacher because she’s so enthusiastic, it’s wonderful really you know, everybody’s coming in and she’s so encouraging. She’s absolutely splendid and doesn’t give up on you either”.*

### **Control group**

Members of the control group were given the same dietary advice as the intervention group and were encouraged to attend weekly to be weighed. However, the majority did not attend each week and some weeks there was only one person from the control group attending. Some of the control group commented that they had felt left out or ‘pushed out’ when they had to leave before the yoga session was about to run, one said it was an odd situation. Others were quite philosophical and felt there was a delay in their yoga group starting, rather than that they were missing out. One participant made the following comment:

*“I did yoga before and I didn’t mind, at first I was a bit disappointed I wasn’t part of the yoga group because I know how much I enjoyed the yoga but I knew that I would be going back to it so. But the diet I lost over a stone”*

One participant described how being part of the control group actually made her feel more determined:

*“I was more determined to lose because I felt I was going to be the failure group, you know the people doing the yoga thought they were going to lose anyway, if they were doing yoga. I think something made me try harder and to actually lose something because I thought that I was the failure group from the start”.*

Participants were also looking forward to receiving the yoga component once the project had ended and viewed the opportunity to do so as a positive step in managing their health.

## **Discussion**

This project comprised a pilot intervention to explore the use of yoga for weight control. The sample size available was limited by the availability of resources, both in terms of funding to run a larger study, and constraints on numbers that could be catered for within a group session. A limitation of the study is the small sample size. The results relating to weight loss should therefore be treated with caution. The sample was self-selecting, comprising females only and therefore was not representative of the population. Although some participants did drop out, this was actually minimal, with over 80% of both groups remaining in the project over 20 weeks. Both the intervention and the control group lost weight, with greater weight loss seen in the intervention group, which comprised a statistically significant difference, although this difference was no longer seen when the two most extreme outliers were excluded. Both groups made improvements to their dietary intake, including a reduction in energy and fat intake, and a modest increase in dietary fibre, although these findings are from food diaries collected on less than half the sample. Participants in the intervention group were positive about the intervention overall and felt that it had an impact on their eating habits and their ability to make changes to their weight and eating. It is not possible to say which aspect of the intervention, if any, was responsible for weight loss in this sample, although the dietary changes made, if representative of the whole sample, were in line with dietary recommendations for a healthy diet, suggesting they played a part.

The findings of this project hold promise for the role of yoga for weight control and more research is warranted to test the effectiveness of this approach. There are a number of factors that need to be considered and controlled for in future research. First, it is important to control for any tutor effect to see if any effect is due to the impact of the intervention itself or whether

it is the person who delivers the intervention that might be more important. This is a particular issue when an intervention is delivered by one person, but can be overcome by training a number of people to deliver an intervention. It is also possible that an as yet unknown factor is responsible, or that the population was not representative of the population as a whole and the weight loss seen in this project cannot be reproduced in a different setting. These issues require a more rigorous study design such as a pragmatic randomised controlled trial or controlled before and after study. A larger sample size will ensure adequate statistical power to detect a statistically and clinically significant effect, if one exists. Ideally, future research should aim to compare the diet alone, yoga alone and the diet and yoga for weight control class combined, with a control group receiving no intervention at all. This would enable the individual components to be assessed. Short term weight loss is relatively easy to achieve, particularly when motivation is high, but it is harder to maintain weight loss over the longer term. Therefore future interventions should also have adequate follow up, preferably with duration of at least one year.

## **Summary**

### **What we know from this project**

- Yoga, incorporating affirmations, relaxation and dietary advice was an acceptable method of weight loss to the participants involved in this project.
- Both intervention and control participants were able to lose weight, with the intervention group losing significantly more weight than the control group.
- Both groups were able to make positive changes to their diets, including a reduction in kilocalories and fat intake and a modest increase in dietary fibre intake.

### **What we don't know from this project**

- Which part(s) of any intervention involving yoga are most likely to be effective – the yoga itself, the diet, the tutor or some other unknown variable. This needs to be tested in a larger scale study.