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# The effect of a multicomponent lifestyle intervention in patients with obesity: the LIBRA cohort

## Background

People with obesity have an increased risk of developing lifestyle diseases such as type 2 diabetes and cardiovascular diseases. Lifestyle interventions have shown to improve general health in the short term. We aimed to investigate if a multicomponent intervention focusing on behavioural and mental factors could improve general health, measured as physical activity, diet, weight change and quality of life. The effect was measured after the intervention (6 months) and at 18 months.

## Material and Methods

In this pragmatic trial all patients admitted to Department of Lifestyle Rehabilitation at Horsens Regional Hospital in a period of three years were invited to participate in the LIBRA-cohort. National questionnaires and Short-Form Health Survey (SF-12) were used for measurements at baseline and after 6 and 18 months.

## Patients

Patients were excluded if they were unable to read or understand questionnaires. Patient demographics are illustrated in Figure 1.

|          |        |          |           |                        |                      |
|----------|--------|----------|-----------|------------------------|----------------------|
| n = 1336 | Age 51 | 25% male | BMI M: 39 | Body weight M: 114 kg. | Salary from work 47% |
|----------|--------|----------|-----------|------------------------|----------------------|

**Figure 1:** Patient demographics at baseline, n: number of patients, M: median

## Intervention

The lifestyle intervention was group based and multicomponent including behavioural and mental factors. Behavioural factors were diet, smoking, alcohol and physical activity. Mental factors were competences, respect, accept and coping. The intervention consisted of three modules of four days within six months and there was a motivating phone call between modules (Figure 2).



**Figure 2:** Intervention period of 6 months and study period of 18 months, Module 1, 2, 3: in hospital intervention, Call: Phone call between the modules



## Results

### Increased physical activity

↑ 1 more day of physical activity per week

↑ 1/5 more patients participated in leisure time sport

Physical activity was defined as being moderately physically active in minimal 30 minutes during sport or demanding work. Patients reported being physically active with a median of 3 days per week at baseline. This was increased by one third to a median of 4 days per week at the end of intervention. The change was statistically significant and was maintained at follow up.

More patients participated in leisure time sport. At the end of intervention 59% reported to participate in leisure time sport compared to 44% at baseline and 51% at 18 months follow up.

### Improved diet

The intervention significantly improved overall diet. After the intervention 8% had an unhealthy diet as compared to 17% before (p<0.001) and 9% at follow up (p<0.001).

### Weight loss

Patients experienced a median weight change of -5% [-2;-8%], p<0.001 from baseline to the end of the intervention and -4% [-0.001;- 9%], p<0.001 at 18 months follow up.

### Improved Health-related Quality of life

Patients improved their physical and mental health measured with SF-12 after intervention and at follow-up. The effect size of the SF-12 was significant at all subscales and total scores (p<0.001) (Figure 3). More than 40% experienced a minimal important change (MIC) in physical and mental scores when used a 5 points change as MIC.

Health-related Quality of life - Effect size



**Figure 3:** Effect size of the SF-12 score is shown for 8 subscales and total scores of Physical and Mental health at 6 months (end of intervention) and 18 months follow up

## Conclusion

In this large study from a Danish rehabilitation centre including people with a BMI more than 30, a multicomponent lifestyle intervention was found to increase physical activity, improve diet quality, reduce body weight and improve health-related quality of life. The results were obtained at the end of the intervention and were maintained at 18 months follow-up.

## Perspective

Maintaining lifestyle change is a major problem and the challenge need further investigation in a long-term perspective. Patients were very satisfied with their treatment and 91% of them highly recommended the intervention.



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