

Supplementary

# Diet Therapy of Obstructive Sleep Apnea Syndrome Treated with Positive Airway Pressure: A Systematic Review of Randomized Controlled Trials

Dominika Guzek <sup>1,\*</sup>, and Dominika Głąbska <sup>2</sup>

<sup>1</sup> Department of Food Market and Consumer Research, Institute of Human Nutrition Sciences, Warsaw University of Life Sciences (SGGW-WULS), 159C Nowoursynowska Street, 02-776 Warsaw, Poland

<sup>2</sup> Department of Dietetics, Institute of Human Nutrition Sciences, Warsaw University of Life Sciences (SGGW-WULS), 159C Nowoursynowska Street, 02-776 Warsaw, Poland; dominika\_glabska@sggw.edu.pl (D.Gl.)

\* Correspondence: dominika\_guzek@sggw.edu.pl (D.Gu.); Tel.: +48-22-593-71-34

**Supplementary Table S1.** The results and conclusions formulated within the randomized controlled trials included to the study.

| Ref. | Results   | Conclusion  |
|------|---|---|
| [23] | At week 9, the intervention group's mean body weight was 20 kg (95% confidence interval 18 to 21) lower than that of the control group, while its mean AHI was 23 events/h (15 to 30) lower. In the intervention group, five of 30 (17%) were disease free after the energy restricted diet (AHI <5), with 15 of 30 (50%) having mild disease (AHI 5-14.9), whereas the AHI of all patients in the control group except one remained at 15 or higher.   | Treatment with a low energy diet improved obstructive sleep apnea in obese men, with the greatest effect in patients with severe disease.                           |
| [39] | At end-point, the intervention group exhibited small reductions in body mass ( $P = 0.007$ ) and body fat percentage ( $P = 0.044$ ). At follow-up, changes in body mass ( $P = 0.010$ ), and body fat percentage ( $P = 0.033$ ), were maintained. Within the quality of life, there was a reduced proportion of participants in the intervention group reporting problems in performing usual activities at end-point ( $P = 0.044$ ) but not follow-up ( $P = 0.375$ ). There were no changes in the other four EQ5D domains. Although there was no significant change in self-perceived health score (i.e., EQ Visual Analogue Scale) at end-point, there was significant improvement at follow-up ( $P = 0.017$ ). | A lifestyle intervention in obstructive sleep apnea has been shown to improve body mass and at follow-up also self-perceived health score.                          |
| [40] | Weight reduction was higher for the intervention group than the control group at 3 and 12 months ( $P < 0.001$ and $P < 0.001$ , respectively), as was loss of visceral fat at 12 months. AHI decreased more in the intervention group at 3 months (−23.72 versus −9 events/h) but the difference was not significant at 12 months, though 28% of patients from the intervention  | An intensive weight-loss program in patients with obesity and severe obstructive sleep apnea is effective for reducing weight and obstructive sleep apnea severity. |

|      |   |   |
|------|---|---|
|      | group had an AHI < 30 events/h compared to none in the control group ( $P = 0.046$ ).   |   |
| [41] | <p>The intervention group had a greater decrease in AHI (51% reduction; change, <math>-21.2</math> events/h; 95%CI, <math>-25.4</math> to <math>-16.9</math> events/h) than the control group (change, <math>2.5</math> events/h; 95% CI, <math>-2.0</math> to <math>6.9</math> events/h) at the intervention end point, with a mean between-group difference of <math>-23.6</math> events/h (95%CI, <math>-28.7</math> to <math>-18.5</math> events/h). At 6 months after intervention, the reduction in AHI was 57% in the intervention group, with a mean between-group difference of <math>-23.8</math> events/h (95% CI, <math>-28.3</math> to <math>-19.3</math> events/h). In the intervention group, 18 of 40 participants (45.0%) no longer required CPAP therapy at the intervention end point, and 6 of 40 participants (15.0%) attained complete OSA remission. At 6 months after intervention, 21 of 34 participants (61.8%) no longer required CPAP therapy, and complete remission of OSA was attained by 10 of 34 participants (29.4%). In the intervention vs control group, greater improvements in body weight (change, <math>-7.1</math> kg [95%CI, <math>-8.6</math> to <math>-5.5</math> kg] vs <math>-0.3</math> kg [95%CI, <math>-1.9</math> to <math>1.4</math> kg]) and composition (eg, change in fat mass, <math>-2.9</math> kg [95%CI, <math>-4.5</math> to <math>-1.3</math> kg] vs <math>1.4</math> kg [95%CI, <math>-0.3</math> to <math>3.1</math> kg]), and health-related quality of life (eg, change in Sleep Apnea Quality of Life Index, <math>0.8</math> points [95%CI, <math>0.5</math>–<math>1.1</math> points] vs <math>0.1</math> points [95%CI, <math>-0.3</math> to <math>0.4</math> points]) were also found at the intervention end point.</p> | An interdisciplinary weight loss and lifestyle intervention involving Spanish men with moderate to severe obstructive sleep apnea and had overweight or obesity and were receiving CPAP therapy resulted in clinically meaningful and sustainable improvements in obstructive sleep apnea severity and comorbidities as well as health-related quality of life. This approach may therefore be considered as a central strategy to address the substantial impact of this increasingly common sleep disordered breathing condition. |
| [42] | <p>AHI scores improved significantly in both groups (CPAP, <math>p=0.0231</math>; CPAP+LCKD, <math>p=0.0272</math>). However, combining CPAP and LCKD registered no advantage on the AHI score (<math>p=0.863</math>). Furthermore, body weight, was significantly reduced in the CPAP+LCKD group after 4 weeks (<math>p=0.0052</math> vs baseline).</p>  | Combined with CPAP, LCKD-induced weight loss seems to not have a significant incremental effect on AHI.   |

AHI – apnea hypopnea index; CPAP – Continuous positive airway pressure; EQ5D – Euro-Quality of Life Questionnaire; LCKD – Low-calorie ketogenic diet; OSA – Obstructive sleep apnoea.

**Disclaimer/Publisher’s Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.