

309

### Effect of carnosine supplementation on cardiometabolic risk factors in obesity, prediabetes, and diabetes: a meta-analysis of randomized controlled trials



Barbora De Courten\*, Aya Mousa, Kirthi Menon

Monash University, Clayton, VIC, Australia

The burden of diabetes is rapidly increasing in line with the growing obesity epidemic. Identification of simple and easily scalable interventions is therefore urgently needed. Carnosine (beta-alanyl-L-histidine), a dipeptide with anti-inflammatory, anti-oxidative, and anti-glycating properties, has been proposed as a potential strategy for the prevention of diabetes. However, previous studies examining the effects of carnosine on cardiometabolic risk factors have produced inconsistent results. Here, we present the first systematic review and meta-analysis examining the effects of carnosine supplementation on cardiometabolic risk factors. Electronic databases including Medline, CINAHL, EMBASE and EBM Reviews were searched to identify all randomized controlled trials (RCTs) comparing supplementation with carnosine versus placebo, usual care or other interventions. In meta-analyses of five trials with 309 participants, carnosine-supplemented groups had lower HbA<sub>1c</sub> (mean difference (MD) [95% CI] = -0.5% [-0.4, -0.6],  $p < 0.001$ ); fasting glucose (MD [95%CI] = -0.6 mmol/L [-1.1, -0.1],  $p = 0.03$ ); postprandial glucose (MD [95%CI] = -1.0 mmol/L [-1.4, -0.6],  $p < 0.001$ ); triglycerides (MD [95%CI] = -0.4 mmol/L [-0.6, -0.3],  $p = 0.005$ ); and high-sensitivity C-reactive protein (MD [95%CI] = -0.4 mg/L [-0.6, -0.2],  $p < 0.001$ ) compared with placebo. Low statistical heterogeneity was observed for all outcomes ( $I^2 = 0-1\%$ ) except fasting glucose ( $I^2 = 84\%$ ). However, heterogeneity in study design was an important limitation, including the different populations studied, and the use of varying doses of carnosine and mixed supplementation. Nevertheless, our findings suggest that carnosine may improve cardiometabolic risk factors and further well designed randomized controlled trials are needed to confirm these findings.

<https://doi.org/10.1016/j.orcp.2018.11.197>

310

### Comparing two exercise training doses on arterial stiffness and blood pressure in adults with overweight/obesity and type 2 diabetes: a randomised controlled trial



Trishan Gajanand\*, Shelley E. Keating, Wendy J. Brown, Matthew D. Hordern, Emily Cox, Robert G. Fassett, Jeff S. Coombes

School of Human Movement and Nutrition Sciences, The University of Queensland, Brisbane, Queensland, Australia

**Introduction & aims:** Arterial stiffness (AS) is thought to increase with glucose intolerance. Combined aerobic and resistance moderate intensity continuous training (C-MICT) has been shown to improve AS in people with chronic disease. The combination of high-intensity interval aerobic with high-intensity resistance training (C-HIIT) has not been previously investigated in adults with type 2 diabetes (T2D). We aimed to compare the efficacy of 8 weeks of low volume C-HIIT and C-MICT on AS, central and peripheral blood pressures in adults with T2D.

**Methods:** Forty sedentary adults ( $60 \pm 8$ y) with overweight/obesity ( $BMI = 31.5 \pm 6.9 \text{ kg/m}^2$ ) and T2D (glycated

haemoglobin [HbA<sub>1c</sub>]  $61 \pm 13 \text{ mmol/mol}$  [ $7.7 \pm 1.2\%$ ]) were randomised into 8 wks of either: low volume C-HIIT ( $n = 14$ ), C-MICT ( $n = 16$ ), or control ( $n = 10$ ). C-HIIT involved aerobic exercise for 4 min at 85–95% peak heart rate ( $HR_{\text{peak}}$ ) followed by high-intensity resistance training (Rate of Perceived Exertion [RPE]  $\geq 17$ ) involving 8 exercises for 1-min each, on three days/week. Session time was 26 mins = 78 mins/week. C-MICT comprised aerobic exercise for 150 mins/wk over four days at 55–69%  $HR_{\text{peak}}$  and moderate intensity resistance training 60 mins/wk (RPE 11–13). Total exercise time = 210 mins/week. AS was assessed using pulse wave velocity (PWV), central blood pressures were assessed using pulse wave analysis and peripheral pressures using sphygmomanometry; at baseline and post-intervention. ANCOVA was used to determine differences in change scores between groups using the baseline value as the covariate.

**Results:** There were no significant between-group differences for change in PWV ( $0.2 \pm 0.1 \text{ m/s}$ ,  $0.2 \pm 0.2 \text{ m/s}$ , and  $0.2 \pm 0.4 \text{ m/s}$  for C-HIIT, C-MICT and control, respectively), central systolic ( $0.2 \pm 2.7 \text{ mmHg}$ ,  $-1.3 \pm 1.3 \text{ mmHg}$ ,  $2.8 \pm 3.7 \text{ mmHg}$ ) and diastolic ( $-0.6 \pm 1.5 \text{ mmHg}$ ,  $-1.8 \pm 1.1 \text{ mmHg}$ ,  $1.7 \pm 3.2 \text{ mmHg}$ ) pressures, and peripheral systolic ( $0.2 \pm 3.1 \text{ mmHg}$ ,  $-1.2 \pm 1.5 \text{ mmHg}$ ,  $3.4 \pm 4.0 \text{ mmHg}$ ) and diastolic ( $-0.4 \pm 1.5 \text{ mmHg}$ ,  $-1.7 \pm 1.1 \text{ mmHg}$ ,  $1.7 \pm 3.1 \text{ mmHg}$ ) pressures.

**Conclusion:** The novel findings from this study are that 8 weeks of low volume C-HIIT and C-MICT did not significantly reduce AS, central or peripheral blood pressures in adults with T2D.

**Trial registration:** ACTRN12615000475549.

<https://doi.org/10.1016/j.orcp.2018.11.198>

311

### Development and integration of an online standard clinical tool to assess lifestyle habits of children enrolled in paediatric weight management services in New South Wales

Megan L. Gow<sup>1,2,\*</sup>, Jennifer Cohen<sup>1,3</sup>, Shirley Alexander<sup>1</sup>, Louise A. Baur<sup>1,2</sup>, Kyra A. Sim<sup>4</sup><sup>1</sup> The Children's Hospital Westmead, Westmead, NSW, Australia<sup>2</sup> University of Sydney, Sydney, NSW, Australia<sup>3</sup> University of New South Wales, Sydney, NSW, Australia<sup>4</sup> Charles Perkins Centre, Sydney, NSW, Australia

**Introduction:** Standardised clinical data collection tools facilitate data sharing and the evaluation of clinical services across many sites. With the recent growth of secondary and tertiary paediatric obesity clinical services in New South Wales (NSW), there was a need for the development of a common questionnaire to assess the lifestyle habits and anthropometry of children and adolescents. Standardised clinical data collection will enable assessment of the impact of paediatric weight management services across NSW on patient outcomes and allow for comparison of services NSW-wide.

**Methods:** Clinicians and researchers in paediatric weight management services across NSW assisted in the development of the Healthy Lifestyle Questionnaire (HLQ). The HLQ was based on validated questions used in previous national data collection tools including the 2015 NSW Schools Physical Activity and Nutrition Survey and the 2011–2012 NSW Population Health Survey. The HLQ was then built on the online database application Research Electronic Data Capture (REDCap) with each site enabling specific REDCap functions to facilitate data collection at their clinic, including automated invitations for longitudinal data collection.

**Findings:** The final version of the standard HLQ collects demographic, family history and anthropometric data, and questions around daily consumption of fluids, breakfast, vegetables and fruit, weekly consumption of discretionary foods, physical activity, screen time and sleep habits and family meal consumption behaviours. This standard questionnaire is being used to collect data from parents of children and adolescents at enrolment and at 3- and 6-months into their care at seven paediatric weight management clinics across NSW using REDCap.

**Conclusion:** This standard tool will be used to collect data on the long-term lifestyle habits and anthropometry of children and adolescents enrolled in paediatric weight management services. We will use these data to assess and monitor paediatric weight management services, supporting continued service development and improvement.

<https://doi.org/10.1016/j.orcp.2018.11.199>

312

### Body satisfaction in children and adolescents undergoing weight management treatment: systematic review and meta-analysis



Megan L. Gow<sup>1,2,\*</sup>, Natalie B. Lister<sup>1,2</sup>, Susan J. Paxton<sup>3</sup>, Katharine Aldwell<sup>1</sup>, Sarah Thomas<sup>1</sup>, Sarah P. Garnett<sup>1,2</sup>, Louise A. Baur<sup>1,2</sup>, Hiba Jebeile<sup>1,2</sup>

<sup>1</sup> The Children's Hospital Westmead, Westmead, NSW, Australia

<sup>2</sup> University of Sydney, Sydney, NSW, Australia

<sup>3</sup> La Trobe University, Melbourne, NSW, Australia

**Introduction:** Children and adolescents with overweight or obesity have reduced body satisfaction. The aim of this systematic review was to investigate the impact on body satisfaction of weight management interventions for children and adolescents with overweight or obesity.

**Methods:** Four databases were searched in May 2017 to retrieve and identify eligible peer-reviewed articles. Eligible studies included: (1) children and adolescents (<18-years) with overweight or obesity, (2) weight management intervention with a nutrition component, (3) case studies, pre-post studies and randomised controlled trials, (4) pre- and post-intervention assessment of at least one measure of body satisfaction. Meta-analysis was completed where possible.

**Results:** Of 2799 articles screened, 39 studies met the inclusion criteria. Nineteen reported on body satisfaction/dissatisfaction, six on body esteem, 15 on physical appearance, and five each on shape and weight concern. Meta-analysis indicated that weight management interventions led to an improvement in physical appearance (12 studies, small to medium effect size, SMD (SE) 0.390 (0.067),  $p < 0.001$ ) equivalent to an increase in 0.32 (0.066) points on a scale of 1–4. Weight concern did not change (five studies,  $-0.223$  (0.161),  $p = 0.166$ ) and there was a reduction in shape concern (five studies, small effect size,  $-0.34$  (0.156),  $p = 0.029$ ). Although statistically significant, changes may not be clinically significant. Fourteen of 19 studies measuring change in body dissatisfaction and four of six studies measuring change in body esteem reported significant improvements immediately following the weight management intervention. No study reported worsening of body satisfaction measures.

**Conclusion:** This review demonstrates that engagement in weight management interventions does not have a detrimental impact on body satisfaction. In fact, weight management may lead to mild improvements in measures of body satisfaction, including physical appearance and shape concern, in children and adolescents with overweight or obesity.

<https://doi.org/10.1016/j.orcp.2018.11.200>

313

### Health related quality of life measures and weight change in a clinical paediatric population with obesity



Brooke Harcourt\*, Anke Pons, Jeff Kao, Erin Alexander, Celia Twindyakirana, Zoe McCallum, Matthew A. Sabin

Murdoch Childrens Research Institute, Parkville, VIC, Australia

**Background:** Poor quality of life has been shown to occur in youth with obesity. This study aimed to assess associations between health-related quality of life (HRQOL) measures with weight outcomes in a busy paediatric weight management service.

**Methods:** A cross-sectional longitudinal clinical cohort, 'Childhood Overweight BioRepository of Australia (COBRA)', was used ( $n = 250$ , median age 11, range 2–18 year, mean BMI z-score  $2.5 \pm 0.2$ ). Clinical data was collected and HRQOL questionnaires; Pediatric Quality of Life (PedsQL), 'Sizing Me Up' (SMU), and psychological well-being questionnaires; Strengths and Difficulties Questionnaire (SDQ) and Kessler 10 (K10) were completed by the child and primary caregiver. HRQOL results were compared to age and sex adjusted BMI z-score at baseline and follow-up. Direct logistic regression modelling was performed to assess the impact of HRQOL factors on the likelihood of successful weight reduction over a period of  $\geq 12$  months.

**Results:** Mean self-report HRQOL scores were;  $68.0 \pm 15.28$  (PedsQL, range 0–100),  $64.8 \pm 15.8$ , (SMU, range 0–100),  $17.3 \pm 4.4$  (SDQ, range 0–40) and  $20.0 \pm 7.7$  (K10, range 0–50). A significant negative correlation was observed between HRQOL scores and childhood obesity (baseline BMI z-scores ( $p < 0.01$ )). No correlations were observed between psychological well-being measures and BMI z-scores. Higher subscale scores of the PedsQL and SDQ, which measure impaired psychosocial health and less difficulties with hyperactivity and inattention, significantly predict weight loss in obese children after 12 months.

**Conclusion:** HRQOL questionnaires may be useful in identifying individuals who require additional support to achieve weight loss goals in a tertiary weight management service.

<https://doi.org/10.1016/j.orcp.2018.11.201>