

# Chinese primary school children physical activity and dietary behaviour changes intervention (CHIRPY DRAGON Study)

<b>Submission date</b> 19/08/2015	<b>Recruitment status</b> No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered
<b>Registration date</b> 25/08/2015	<b>Overall study status</b> Completed	<input checked="" type="checkbox"/> Protocol
<b>Last Edited</b> 12/09/2023	<b>Condition category</b> Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data

## Plain English Summary

### Background and study aims

The number of overweight and obese children in cities in China is rapidly increasing, and it is highly likely that these problems will continue into adulthood, leading to serious health problems. Effective ways of preventing and controlling levels of childhood obesity are urgently needed, and a good place to start is with young children who are starting school. An obesity intervention programme including diet changes and exercise was previously tested in children from three schools (<http://www.isrctn.com/ISRCTN13619480>). The aim of this study is to find out whether implementing this obesity intervention programme across a larger number of schools in Guangzhou city (China) will be cost-effective and successful in tackling the childhood obesity problem.

### Who can participate?

Children in their first year of primary school in Guangzhou city (China), their family members and relevant school staff.

### What does the study involve?

Forty schools in Guangzhou city in China are selected to take part in the study. These schools are then randomly placed into one of two groups. For schools in the first group (control group) no additional programmes are added to the existing care offered. For schools in the second group (intervention group) the intervention programme will be brought in. The intervention programme consists of four main parts: interactive learning activities to help children and their family members learn more about healthy living, making the meals offered in the schools more healthy and taste better, teaching children and their family members good ways to exercise at home, and finally ensuring that children have to have one hour of physical activity at school every day. The BMI of the children is measured at the start of the study and after one year to compare the amounts of overweight children at both the control and intervention schools.

### What are the possible benefits and risks of participating?

Benefits of participating include improved knowledge and parenting/caring skills of parents, grandparents and teachers, as well as improved diet and physical activity habits in children. The

stud also promotes quality family time, which is a potential benefit. There are no notable risks in participating.

Where is the study run from?

Participating primary schools in Guangzhou (China)

When is the study starting and how long is it expected to run for?

July 2015 to December 2018

Who is funding the study?

Zhejiang Yong Ning Pharmaceutical Co., Ltd (China)

Who is the main contact?

Dr Bai Li

## Contact information

**Type(s)**

Scientific

**Contact name**

Dr Bai Li

**Contact details**

Institute of Health and Population Sciences

College of Medical and Dental Sciences

University of Birmingham

Birmingham

United Kingdom

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## Additional identifiers

**EudraCT/CTIS number**

**IRAS number**

**ClinicalTrials.gov number**

**Secondary identifying numbers**

N/A

## Study information

**Scientific Title**

Developing and evaluating a theoretically based childhood obesity prevention programme in urban China - A cluster randomised control trial

**Acronym**

CHIRPY DRAGON

## **Study hypothesis**

The study will seek to address the following research questions:

1. How effective is the intervention package in preventing overweight and obesity in children, compared to usual practice?
2. For how long do any observed effects persist, after active intervention has ceased?
3. What is the incremental cost associated with supplying the obesity prevention intervention?
4. What is the incremental benefit associated with supplying the obesity prevention intervention?
5. What is the incremental cost-effectiveness ratio of supplying the obesity prevention intervention?
6. How effective is the intervention package in improving diet and increasing physical activity, compared to usual practice?
7. What is the effect of the intervention on quality of life?
8. Is there a trend in difference in outcomes by sex, social class or baseline BMI?

## **Ethics approval required**

Old ethics approval format

## **Ethics approval(s)**

University of Birmingham Science, Technology, Engineering and Mathematics Ethical Review Committee, 02/03/2015, ref: ERN\_14-1440.

## **Study design**

Cluster randomised controlled trial

## **Primary study design**

Interventional

## **Secondary study design**

Randomised controlled trial

## **Study setting(s)**

School

## **Study type(s)**

Prevention

## **Participant information sheet**

## **Condition**

Childhood overweight/obesity, related health behaviours and quality of life

## **Interventions**

40 urban, non-boarding state primary schools in Guangzhou are selected and randomly assigned into the control arm or the intervention arm. All children who are taking part in the trial will undergo baseline and follow-up measures. Follow-up assessments will take place immediately following the delivery of intervention, and 12 months after the intervention. In addition, parents of participating children will be invited to complete questionnaires at both baseline and follow ups.

For schools in the control arm, no additional programmes are added to the existing care offered by the schools.

The intervention arm consists of four key components:

1. Improving health knowledge and behaviours among grandparents/parents and children through interactive learning activities

1.1. Interactive learning workshops targeting carers (parents and grandparents)

1.2. Interactive learning workshops targeting children

1.3. Cross-generation quizzes involving both carers and children

1.4. A range of family-wide health behavioural challenges (with self evaluation) , targeting children and their family members

2. Improving the nutritional quality & taste of school meals through

2.1. Introducing feasible school meal improvement objectives (developed by Chinese nutrition experts, child obesity researchers and school catering workers; and tested in the feasibility trial) to catering staff who are responsible for producing meals at intervention schools

2.2. Regular evaluations/monitoring and providing constructive feedback

3. Increasing the level of physical activity outside campus through:

3.1. Family friendly games learned and practiced at schools (attended by both the children and their fathers or mothers)

3.2. Assigning activity home work to all families (i.e. playing the games learnt at school or doing any non-sedentary activities or sports that involve both the child and his/her parents outside school )

3.3. Completing self-evaluation fun card (this element will be implemented in coordination with component 1's 'family-wide health behavioural challenges').

4. Improving the implementation of the national requirement for 'One-Hour Physical Activity On Campus Each Day' in intervention schools through

4.1. Facilitating an initial school internal stakeholders meeting (led by trained project assistants, attended by school leaders, PE teachers, class head teachers and student representatives ) on current situation, barriers and opportunities for improvement (where specific improvement objectives and action plan will be agreed)

4.2. Regular and continuous evaluations/monitoring (by school staff and project assistants)

4.3. Giving monthly constructive feedback (by project assistants) to school stakeholders and setting new objectives and action plan (jointly) for the following month over each follow up meeting.

## **Intervention Type**

Behavioural

## **Primary outcome measure**

Current primary outcome measures:

The difference in BMI z-scores (standardised deviation scores) between control and intervention schools at the first follow up, taking into account clustering, baseline levels and other relevant co-variates.

Previous primary outcome measures:

1. The difference in BMI z-scores (standardised deviation scores) between control and intervention schools at the first follow up, taking into account clustering, baseline levels and

other relevant co-variables.

2. Comparing the percentage of children categorised as overweight and obese in control compared to intervention schools.

### **Secondary outcome measures**

Current secondary outcome measures as of 01/11/2017:

Secondary outcomes are either binary (e.g. physically active vs. inactive), or continuous (e.g. energy expenditure), and therefore either logistic or linear link functions will be used, with transformations where appropriate to accommodate any non-normality. All model assumptions will be checked, goodness of fit explored and models selected using step wise procedures and analysis of deviance. Anthropometric measures (including percentage of overweight and obesity as defined by the WHO 2007 Growth Charts, waist circumference and body fatness).

1. Dietary Assessment: Parents questionnaire and child diary, where several self designed and adapted validated (University of Leeds SFFQ; Day in Life Questionnaire) questionnaires are included.

2. Physical Activity Assessment: Through parents questionnaire, child questionnaire and child diary, self designed questions and adapt validated (Godin Leisure-Time Exercise Questionnaire; Day in Life Questionnaire and PAQ-C) tools will be used to measure physical activity and sedentary behaviours of participating children. Additionally, a validated objective method (GENEActiv Original) will be used to assess physical activity and sedentary behaviours of the children.

3. Process Evaluation: To understand intervention fidelity as well as participants and facilitators' barriers and facilitators. These will include focus groups and personal interviews with representatives of participants and programme facilitators. Programme facilitators will also be asked to complete a log book on participant attendance, withdrawals, and note any changes or adaptations that they had to make to any sessions, and known reasons.

4. Economic Evaluation: Comparisons will be made between the situation of supplying the intervention package and a situation where no intervention is in existence (i.e. usual current practice). The primary analysis will estimate the cost per Quality-Adjusted Life Year (QALY) using outcomes measured using the CHU9D instrument, a paediatric utility-based QoL measure validated in a Chinese population. The economic evaluation will be conducted from both a public and a societal perspective. The public sector perspective will only include costs linked to delivery of the intervention alongside the average QALY impact on the children; the societal perspective will broaden the framework to include household expenditure and intervention effect on parents and other household adult members. To facilitate this broader perspective, QALYs for parents and other adult household members will be estimated using data collected from the EQ5D instrument. Costs and outcomes will be combined using incremental cost effectiveness ratio (ICER) and expressed as cost per QALY gained. A secondary analysis will conduct a cost-effectiveness analysis using BMI z scores as the outcome in line with the clinical evaluation. The incremental cost-effectiveness ratio for the intervention versus usual practice will thus be 'cost per change in BMI z score'.

Previous secondary outcome measures:

Secondary outcomes are either binary (e.g. physically active vs. inactive), or continuous (e.g. energy expenditure), and therefore either logistic or linear link functions will be used, with transformations where appropriate to accommodate any non-normality. All model assumptions will be checked, goodness of fit explored and models selected using step wise procedures and analysis of deviance.

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4. **Economic Evaluation:** Comparisons between the situation of supplying the intervention package and a situation where no intervention is in existence (i.e. usual current practice) to estimate the cost per Quality-Adjusted Life Year (QALY) using outcomes measured using the CHU9D instrument, a paediatric utility-based QoL measure validated in a Chinese population.

### **Overall study start date**

01/07/2015

### **Overall study end date**

31/12/2018

## **Eligibility**

### **Participant inclusion criteria**

1. First year students (aged 6–7) from non-boarding state primary schools in Guangzhou city (China)
2. Students' family members
3. Relevant school staff

### **Participant type(s)**

Mixed

### **Age group**

Mixed

### **Sex**

Both

### **Target number of participants**

Children and their family members of a randomly selected class (common class size = 45 students) from each participating school (40 schools in total) will be invited to participate in base line and follow up measures (total child sample target will be around 1600). All first year students (aged between 6 and 7 years) of the intervention schools, their family members as well as relevant school staff will be offered the intervention programme.

### **Total final enrolment**

1641

## **Participant exclusion criteria**

Children:

1. Not from randomly selected schools
2. No parental consent given

## **Recruitment start date**

01/09/2015

## **Recruitment end date**

30/09/2015

## **Locations**

### **Countries of recruitment**

China

### **Study participating centre**

Participating primary schools in Guangzhou, China

China

n/a

## **Sponsor information**

### **Organisation**

University of Birmingham

### **Sponsor details**

Edgbaston

Birmingham

England

United Kingdom

B15 2TT

### **Sponsor type**

University/education

### **ROR**

<https://ror.org/03angcq70>

## **Funder(s)**

### **Funder type**

Industry

## Funder Name

Zhejiang Yong Ning Pharmaceutical Co., Ltd

# Results and Publications

## Publication and dissemination plan

The results of the effectiveness and cost-effectiveness of the intervention will be reported through international conferences, high impact peer-reviewed journals and suitable media. Once the effectiveness of the intervention package has been established and quantified, we would seek to implement the intervention more widely and continue to assess its impact. Established links with Chinese local government provide opportunities to facilitate this. Findings from the process (delivery) evaluation will help to explain the observed outcomes of the trial and inform future development, adaptation or adoption of the developed programme in the same or similar population groups, so will be published on a suitable international journal.

Baseline findings; and effect of the intervention on children's dietary and physical activity behaviour as well as quality of life (including also any differences in the effect among gender and socioeconomic groups) will also be assessed and likely to result in at least two further peer reviewed publications (potential journal targets are: British Medical Journal and International Journal of Behavioural Nutrition and Physical Activity), as well as being disseminated through international conferences and suitable digital media.

## Intention to publish date

01/12/2018

## Individual participant data (IPD) sharing plan

Data are available upon request by contacting the first author but are not publicly available due to our ethical permissions. Re-analysis and secondary analysis will need to be within the original remit of the research question and will need to be approved by the research team in advance of sharing the dataset.

## IPD sharing plan summary

Available on request

## Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Protocol article</a>		01/12/2017		Yes	No
<a href="#">Results article</a>	results	26/11/2019	27/11/2019	Yes	No
<a href="#">Other publications</a>	An assessment of the construct validity	26/08/2021	12/09/2023	Yes	No
<a href="#">Other publications</a>	Cost effectiveness	25/08/2021	12/09/2023	Yes	No