Health Care and Promotion Committee

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Our Ref.: ( ) in FHB/H/41/131
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4 April 2018

Dr GAO Yang
Assistant Professor
Department of Physical Education
Hong Kong Baptist University
12/F, Shek Mun Campus, On Muk Street
Shatin, New Territories, Hong Kong

Dear Dr Gao,

Health Care and Promotion Scheme
Application No.: 01170068

I am pleased to inform you that the Health Care and Promotion Committee has approved a grant of HK$334,520 for your application titled "*School-based physical activity intervention for obesity among adolescents with intellectual disability in Hong Kong*". The Agreement has been sent to the research office of your institution. They will liaise with you for signing the Agreement.

I would like to highlight the following for your special attention:

(a) Please complete the enclosed declaration form.
(b) The commencement date of this project should be within 6 months of the date of this letter.
(c) You and your witness are required to sign three copies of the Agreement.
(d) The terms and conditions on reporting requirements, ethical approval, intellectual property rights and administrative issues are summarised at **Annex**.
(e) Please return the signed copies of the Agreement together with the declaration form to the Research Fund Secretariat **via the Research Office** by **18 April 2018**.

In addition, the Principal Applicant and Administering Institution should seek **prior approval** from the Research Fund Secretariat for any change of Principal Applicant, Co-Applicant(s), scope, study design, methodology, sample size, project duration, or approved budget. You may also wish to visit our website for the guidance note and information about submission of the interim and final reports (https://rfs.fhb.gov.hk/).

study duration: 01/07/2018 to 31/12/2019

EXECUTIVE SUMMARY (Limited to one A4 page and 400 words)

- Aim and Objectives
- Target Group and Size
- Deliverables
- Key Milestones
- Total Financial Support Requested

- Aims and Objectives: This project aims to design and implement a school-based 3-staged physical activity (PA) intervention programme to reduce obesity among adolescents with mild and moderate intellectual disability (ID) in Hong Kong. Specifically, the objectives of the project are:
  1. To reduce body mass index (BMI) among a sample of overweight and obese adolescent children with ID in local special schools;
  2. To reduce % body fat among the sample;
  3. To reduce waist-to-height ratio among the sample;
  4. To reduce overweight and obese status among the sample;
  5. To improve PA levels among the sample.

- Target Group and Size: The target population of the project will be adolescents with mild and moderate ID (aged 12- 18 years) who are overweight and obese. Sixty-four overweight and obese students from 4-6 special schools will be recruit (32 in intervention group and 32 in control group).

- Deliverables: Expect for the final project report, a manual of the intervention will be generated after completion of the project, with contents covering but not limited to background introduction, how to prepare, implement, and wrap up the intervention. We will also record what components of the intervention worked and what did not. We will present our findings in at least one international conference and publish at least one article in peer-reviewed international journals. If effective, the intervention programme will be run independently by the participating schools after the funding period. It can also be disseminated in other special schools and normal schools to reduce obesity among their students with ID. We will integrate the programme into our courses. Thus, our students can continue delivering the programme in their working schools after graduation. Last but not the least, we will share all deliverables via Facebook and Instagram, which can be used for learning and sharing by schools, parents and other stakeholders in future.

- Key Milestones:

01/07/2018 – 31/08/2018	Preparation (literature review, development of intervention plan, and data collection tools)
01/09/2018 – 30/09/2018	Recruitment of participants, pre-intervention measurements
01/10/2018 – 30/06/2019	Intervention, post-intervention measurements
01/07/2019 – 30/09/2019	Data entry, data analysis
01/10/2019 – 31/12/2019	Report and paper writing

- Total Financial Support Requested: HK$ 334,520

13. PROPOSED PROJECT

(a) Title: School-based physical activity intervention for obesity among adolescents with intellectual disability in Hong Kong

(b) Justification for conducting the project:

(i) Health needs of the local community (supported by published data or relevant experiences)

Childhood obesity is a major threat to public health internationally, not only because of its well-documented adverse health effects in both childhood and later adulthood, but also its rising trend in prevalence rate over the past decades (Lakshman 2012). The transition from adolescence to young adulthood is recognized as a particularly high-risk period for weight gain, as this critical period is associated with unhealthy lifestyle, including decreased physical activity (PA) levels, increased sedentary time, and decreased diet quality (Nelson, 2008). There is clear evidence that unhealthy lifestyle and obese status established in adolescence continue into adult life and ultimately contribute to early mortality.

Children with intellectual disability (ID) refers to those with significantly reduced ability to understand new or complex information, to learn new skills (impaired intelligence) and to cope independently (impaired social functioning), which starts before the age of 18 years (before adulthood) and has a lasting effect on development. According to the 10th International Classification of Diseases (ICD10), the severity levels of ID are mild (intellectual quotient (ID) of 50-69), moderate (35-49), severe (20-34), and profound (<20). It is estimated that about 1% to 1.25% of the world population are living with ID (Hutzler 2010). In Hong Kong, the latest data indicated that the number of intellectually disable youth aged 15-24 years were 8,141 in 2012, about 0.90% of the whole population in the same age group (Commission on Youth 2014).

It is suggested that children with ID might be more vulnerable to obesity compared to their general counterparts, as they tend to be less active and less empowered to choose and take healthy behaviours (Ptomey 2015; San 2016). We conducted a cross-sectional study among 558 children with mild and moderate ID from 12 special schools in Hong Kong in 2015 (Gao 2016). Results of the study revealed that the prevalence rate of overweight and obesity among the children with ID was 1.5 times that of local general children (31.3% vs. 20.3%, Gao 2016; School Health Service 2012). More adolescents with ID (aged 13 and above) were overweight and obese compared to younger children with ID (aged 6-12 years). Near half of the children (48.3%) spent four and more hours per day in sedentary behaviours, whilst only one tenth of them (10.1%) met the recommended moderate to vigorous PA (MVPA) level of 60 min/day by the WHO. Our results confirmed the higher risk for obesity among adolescents with ID than their general counterparts. There is an urgent call for effective intervention to reduce obesity among this population, in which PA promotion should be involved and regarded as the top priority.

Our previous study covered more than one third of all local schools for children with mild and moderate ID (12 out of 31 schools). By communicating with contact persons of the study schools (including PE teachers, directors of academic affairs, and principals), we obtained the following insights of current situations: (1) most of the contact persons perceived obesity as a health problem for their students; (2), they perceived that, like typically developing children, insufficient PA and unhealthy diet contributed to the epidemic of obesity among children with ID. However, there were additional risk factors among those special children; (3), most of the participating schools encouraged their students to do more exercises. However, the children's PA behaviour and obesity did not change much; (4), they agreed that a solid PA programme might be promising to reduce obesity. Such programme must be designed to address those children's special needs (such as limited intellectual functioning and adaptive behaviour).

(ii) Literature review on others' strategies to address these needs

Numerous studies among general child population have suggested that increasing PA is an effective intervention to reduce obesity (Gao 2008; Waters 2011; Lavelle 2012; Sobol-Goldberg 2013), as it plays an important role in energy balance and regulation of body weight, through increased energy expenditure, improved appetite control, and reduced energy intake (Prado 2015). Schools are considered an ideal environment for delivering such interventions to children, as they spend most of their waking time at school and have access to school facilities for exercise (Waters 2011). Several meta-analyses have demonstrated that school-based interventions (PA only or combined with dietary intervention) are effective to reduce body mass index (BMI) (Waters 2011; Lavelle 2012; Sobol-Goldberg 2013). Interventions used PA in isolation produced a significant BMI reduction of -0.17 kg/m^2 in a recent meta-analysis (Lavelle 2012). There is a gradually increasing voice suggesting interventions addressing a single behaviour be more effective to those targeting multiple behaviours simultaneously (Schulz 2015). PA may be more preferred than diet to be the gateway behaviour, given its additional effects on improved appetite control and reduced energy intake (Carraça 2013, Harris 2015, Tucker 2002). In addition, interventions addressing overweight and obese children achieved larger effects than those delivered to all children (reduced BMI: -0.35 kg/m^2 vs. -0.16 kg/m^2, Lavelle 2012). Sobol-Goldberg (2013) suggested that long-term school-based interventions were more effective compared to short-term interventions.

(iii) Scientific evidence supporting the strategies to address these needs proposed in this project

Different from those for the typically developing children, PA interventions for children with ID are very scarce, though they are even more vulnerable to obesity. Moreover, previous studies in this population have mainly aimed to test the effectiveness on physical fitness (Shin 2012). A recent meta-analysis on eight PA interventions for individuals with ID at all age groups revealed no significant effects on body weight and body composition, though some studies reviewed in the meta-analysis reported effective (Harris 2015). However, the authors concluded that the results were inconclusive as the published studies and participants involved were inadequate. More intervention studies should be conducted to make up the knowledge gap and PA interventions with a long-time duration might be promising (Harris 2015). There were two interventions for adolescents with ID in that meta-analysis, both of which had a duration less than 10 weeks and reported non-significant results (Elmahgoub 2011; Gonzalez-Aguero 2011). A recent study evaluated effects of a 9-month PA intervention among 23 overweight/obese adolescents with ID, in which intensity was gradually increased to their special needs (Salaun 2014). Results from that study indicated that the programme was effective to reduce waist circumference, waist-to-height ratio, and % body fat. However, its pre-experimental study design (without a control group) makes it difficult or impossible to rule out alternative explanations than the intervention itself.

In summary, (1) children with ID are at high risk for obesity, especially adolescent children; (2) PA interventions with a longer duration are effective to reduce obesity among typically developing child population and might be promising among those with ID; (3) children's special needs should be taken into consideration in the PA interventions; (4) children studying in local special schools have no pressure for academic study, which makes implementation of a long-term school-based PA intervention reasonable and feasible. In addition, some principals of the study schools in our previous study expressed their demand and willingness to reduce obesity among their students.

(c) Aim and Objectives:

This project aims to design and implement a school-based 3-staged PA intervention programme to reduce obesity among adolescents with mild and moderate ID in Hong Kong. Specifically, the objectives of the project are:

1. To reduce BMI among a sample of overweight and obese adolescent children with ID in local special schools;
2. To reduce % body fat among the sample;
3. To reduce waist-to-height ratio among the sample;
4. To reduce overweight and obese status among the sample;
5. To improve PA levels among the sample.

(d) Project Plan:

(i) Target group

The target population of the project will be adolescents with mild and moderate ID (aged 12- 18 years) who are overweight and obese. We will adopt a randomised controlled trial (RCT) design and recruit 64 overweight and obese students from 4-6 special schools, and then randomly and equally assign them into the intervention and control groups (32 in each group). This sample size can test an effect size of 0.722 kg/m^2 (mean difference in change of BMI divided by pooled standard deviation), with an attrition rate of 20%. The selection criteria of participants include: (1) children with mild and moderate ID; (2) aged 13-18 years old; (3) being overweight or obese; (4) without physical disability; (5) without medical predispositions towards obesity (genetic syndrome or drug treatment) that could interfere with the results of the study; and (6) without contraindications for regular physical activity (e.g. asthma, heart disease). A written informed consent will be obtained from their parents/guardians in advance.

(ii) Implementation plan

1. Description of intervention:

The PA intervention will be modified from an adapted physical activity (APA) programme for obesity management among adolescents with ID (Salaun 2014). APA programmes aim to promote PA and health for people in special needs, such as people with ID. In this study, the APA programme will be carefully designed based on a comprehensive pre-intervention assessment of each participant, and then to address their individual needs in learning and adaption. It will comprise three stages of PA training at school and each stage will consist of simple and fun endurance and strength-building exercises, gradually increasing in duration and intensity, at a frequency of two sessions per week, and last for about three months (Figure 1). Two exercise sessions per week will give participants enough time to recover. A total time period of nine months was determined due to the following two considerations: (1), children with ID need more time to learn and adapt to a PA programme. Previous studies suggested that a 9-month APA program was suitable and effective to reduce obesity among children with ID (Salaun 2014); (2), local special schools usually plan their activities on a basis of an academic year, which is about 9 months.

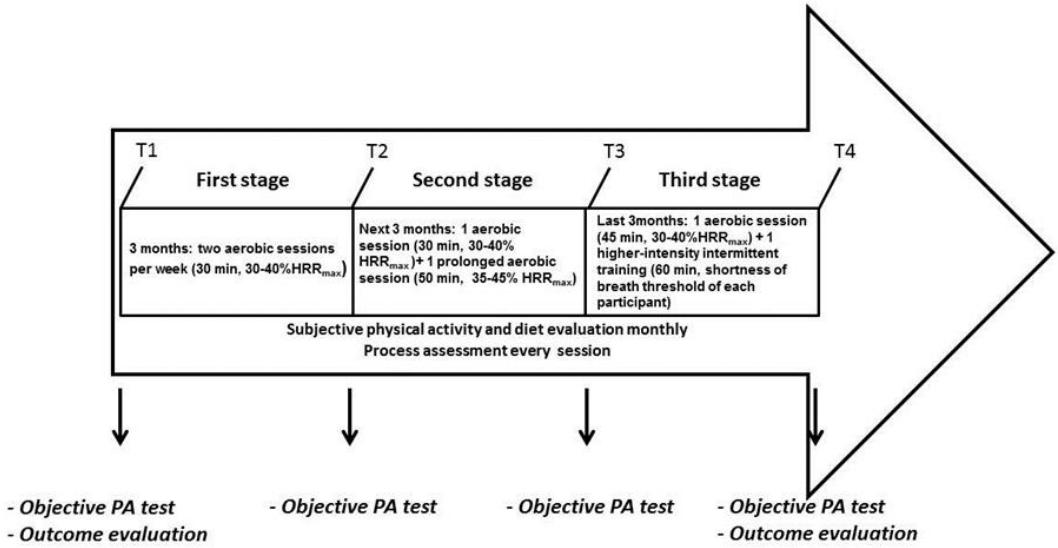

Figure 1 Procedures for intervention delivery and data collection

Stage 1: the PA training on this stage will consist of two 30-min aerobic sessions per week at a moderate intensity of 30-40% of maximal heart rate reserve (% HRR_{max}), Equations 1 and 2. Maximal heart rate (HR_{max}) will be predicted using Fernhall's equation for children with ID (Fernhall 2001), where HR_{max} *(in beats/min)* = 189 - 0.56 × age *(in years)*. For example, for a 15-years-old participant with a measured resting heart rate (HR_{rest}) of 70 beats/min, his/her target exercise heart rate (exercise HR) will be 114 beats/min to reach 40% HRR_{max} (Equation 3). We adopted the % HRR_{max} method because it is more precise than % HR_{max}, as it considers individual variability of HR_{rest}. We did not adopt the percentage of maximal oxygen uptake (% VO_{2max}) method as it may result in negative consequences to measure or predict VO_{2max} among children with ID (Abut 2015).

$$\%\,HRRmax = \frac{exercise\ HR - HRrest}{HRR} \times 100\% \quad \text{..... Equation 1}$$

$$HRR = HRmax - HRrest \quad \text{..... Equation 2}$$

$$exercise\ HR = \%\,HRRmax \times (HRmax - HRrest) + HRrest \quad \text{..... Equation 3}$$

where, % HRRmax: percentage of maximal heart rate reserve; exercise HR: exercise heart rate; HRrest: resting heart rate; HRR: heart rate reserve; HRmax: maximal heart rate.

Stage 2: the weekly PA training on this stage will consist of one 30-min aerobic session at an intensity of 30-40% HRR_{max} and one prolonged aerobic session at an intensity of 35-45% HRR_{max} for 50 minutes.

Stage 3: this stage will consist of one aerobic session (30-40% HRR_{max}, for 45 minutes) and one higher-intensity intermittent training (shortness of breath threshold of each participant, for 1 hour) in each week.

The working load will be individualized and determined based on each participant's PA level measured at the first beginning of each stage. On each stage, each participant will be given about four weeks to adapt the training programme, when the working load and duration will be gradually increased to reach the target intensity and duration (e.g.: 30-40% HRR_{max} for 30 minutes on Stage 1). The strength-building component in each session, consisting of upper and lower limbs resistance training, will play an important role in improving basal metabolic rate (to speed up fat burning) and preventing physical activity related injury (PARI). The types of exercises in the intervention will be designed by both the research team and PE teachers in the study schools to eliminate the participants' boredom, avoid their attention deficit, and then to enhance their adherence to the intervention. A research assistant (RA) and the PE teachers in the study schools will deliver the intervention to the participants. The participants will also be provided with positive reinforcement and clear feedback to improve comprehension and increase confidence during exercises.

2. Description of control:

The participants in the control group will receive routine PE classes as usual during the intervention period (in the academic year of 2018/19).

3. Intervention delivery to controls after the proposed project:

Taking account of ethical issues, the participants in the control group will receive the whole intervention product right after the completion of the intervention (in the academic year of 2019/20). We will seek an internal grant's support from our university (FRG, HKBU) for it.

(iii) Contingency / alternative plan if any problem encountered during implementation

During the intervention, any participant, no matter in which group (intervention or control), will be asked to suspend or even cease participation if being proved not to be suitable for the study any more due to any reason. For instance, if a participant is caught by a bad cold, his/her situation will be evaluated by both researchers and teachers on spot. Sh/e will be asked to keep the original plan, undertake some low-intensity activities, or skip the planned PA session, according to evaluation results. In addition, the case will be recorded and considered in data analysis and result interpretation later on. For a participant with an attendance rate below than 80%, his/her data will be excluded from data analysis. An attrition rate of 20% was therefore involved in sample size estimation to ensure a sufficient power for data analysis. In addition, intention-to-treat analysis will also be performed to avoid bias from the withdrawals.

(iv) Cross-sector collaboration

This project will be undertaken by staff from two universities (Hong Kong Baptist University and Chinese University of Hong Kong), with close collaborations with local special schools. The project team leaders will oversee the whole study; the RA will be in charge of contacting with study schools, designing and implementing the programme, and preliminarily analysing the data; several student helpers will be responsible for pre- and post-intervention measurements and assist the PA during the implementation of the intervention.

(v) Indicators and targets

Outcome indicators will consist of BMI, % body fat, waist-to-height ratio, body weight status, and PA levels. Taking BMI as an example, we expected to achieve an effect size of 0.722 kg/m^2 (mean difference in change of BMI divided by pooled standard deviation) via the intervention.

(vi) Evaluation plan

1. Outcome evaluation

Obesity-related indicators: obesity-related indicators include changes in BMI (kg/m^2, measured weight in kilograms divided by measured height in meters squared), waist circumference in centimeters, waist-to-height ratio (%), and % body fat. In addition, changes in body weight categories (such as changes from overweight/obesity to normal weight, changes from obesity to overweight or vice versa) will also be recorded, where the classification criteria using age- and gender-specific BMI cut-off points suggested by Cole will be adopted (Cole 2000).

Height will be measured to the nearest 0.1 cm using a stadiometer (Holtain Ltd., Pembrokeshire, United Kingdom). Weight will be measured to the nearest 0.1 kg on a digital balance scale (Seca, max. 200 kg, Germany) with the subject wearing lightweight clothing and no shoes. Then BMI will be calculated from weight and height. The waist circumference (in cm) will be measured midway between the lowest rib margin and the top of the iliac crest at the end of gentle expiration. The measure will be performed with a flexible meter ribbon accurate to 0.1 cm. The % body fat will be assessed by bio-impedance (Body stat 1500 MDD, Douglas, Isle of Man, United Kingdom).

All obesity-related indicators will be measured at the T1 (pre-intervention), T2 (end of Stage 1), T3 (end of Stage 2), and T4 (post-intervention) among all participants in the two groups.

Heart rate measurements: HR_{rest} of each participant will be measured at the beginning of each stage using the standard procedure. Participants will wear a Polar T31 Heart Rate Monitor (Polar Electro Inc., Lake Success, NY, USA) during HR_{rest} measurement; their values will be averaged over the 20-min collection period. Exercise HR of each participant will be monitored using the Polar T31 during the instructional process following the standard procedure.

Objective measurement of PA levels: ActiGraph accelerometers (models of GT1M, GT3 and GT3x) will be used to objectively measure each participant's PA levels on the first Mondays at the T1, T2, T3, and T4, over a period of seven days. The PA data will be used to: (1), determine each participant's working loads; and (2), monitor and control for confounding effects caused by possible changes in PA levels other than the intervention itself. ActiGraph accelerometers have been widely used in research and are considered the best choice to objectively assess physical activity in children (Huang, 2009). In the proposed study, 1-min epochs would be selected. Data from accelerometers would be rectified, integrated, and then stored as activity counts per minute, representing the intensity of the activity performed. Counts per minute of 3,200 or above would be defined as MVPA. Averaged daily time spent in MVPA would then be calculated using the ActiLife 6 Data analysis software and used for the time-to-event analyses (IID and the Cox models). For quality control, only those with a record of more than 10,000 movement counts per day for a minimum of four days, consisting of at least three weekdays and one weekend, would be regard valid and included in data analysis.

Subjective measurements of PA and eating habits: participants' PA (including sedentary behaviours) and eating habits in the past week will be reported by their parents or guardians on the first and third Mondays respectively at the T1, T2, T3, and T4. The subjectively measured PA data will be used to monitor any changes in exercise types and format, which cannot be obtained from the objective measurement of PA. The data of eating habits will be used to monitor any changes in eating behaviours during the study period, which may confound the effectiveness of the intervention itself. Both the PA and eating habits questions have been used in our previous study (Gao 2016). The data will be collected in face-to-face interviews or interview calls, with a duration less than 15 minutes.

Other measurements: participants' sociodemographic characteristics (such as age, gender, parental education and occupation, parental marital status), ID level and comorbidities, and parental body weight status will also be collected in this study for controlling and/or explanatory purposes.

2. Process assessment

For the target schools, all participants' parents will be given a self-administered questionnaire right after the major intervention. The questionnaire will aim at evaluating if the participants can get the impacts of the intervention, think the intervention is interesting and useful for preventing their children from obesity, and so forth. In addition, the PE teachers involved will be surveyed and asked about their opinions about the PA intervention (e.g., satisfaction, perceived usefulness and acceptability, etc.). A report summarizing our experiences will be prepared as deliverables for the participating schools and other local schools.

(vii) Results analysis

IBM SPSS Statistics 23 will be used for data analysis. Continuous variables (e.g., BMI) will be presented with mean (standard deviation, SD) and/or median (interquartile rage, IQR) values. All continuous variables pre-intervention will be tested for between-group differences using independent sample t-test. Normality will be checked by QQ-plots, and tested for equal variance assessed by Levene's test. If skewed, the data will be logarithmically transformed before applying t-test.

A general linear model two-way repeated measure ANCOVA will be used to compare significant differences in the changes in the continuous outcome variables between the two groups, where group and time are the two factors of interest (Elmahgoub, 2011). Variables will be selected in a stepwise manner and only those with $p < 0.1$ kept in the final models. A significance level of 0.05 will be adopted (two-tailed test). Intention-to-treat analysis will be adopted and performed to avoid bias from withdrawals or protocol deviations.

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(e) Existing Facilities:

We have all facilities needed in this project, including stadiometers, digital balance scales, Body stat 1500 MDD, Polar T31, ActiGraph accelerometers, questionnaires of subjective measurements of PA and eating habits.

This project will be undertaken by staff in Department of Physical Education, Hong Kong Baptist University (DPE) and JC School of Public Health and Primary Care, Chinese University of Hong Kong (SPHPC). The DPE has a long and proud history of its outstanding achievements across an array of academic fields related to physical education, sport and leisure services, whilst the SPHPC is made up of diverse professionals, such as health promotion specialists, epidemiologists, public health experts, and clinicians. Both of the two institutions will fully support this project. In addition, the team members from the both universities have been smoothly and successfully collaborating with each other on several studies in the past years. Last but not the least, The DPE holds two undergraduate programmes (AD and Top-up) with a focus on special population, through which it keeps a very close relationship with local special schools. Many schools receive our current students to fulfil their internship courses. A large portion of PE teachers are our alumnus. Taking our previous study as an example, we successfully invited more than one third of all special schools for children with mild and moderate ID into that study. Of the participating schools, three proactively asked if we could provide intervention programmes to them in future. Most schools gave positive answers when we asked the possibility to implement an intervention in their schools.

(f) Justification of Resource Requirements:

(i) Details

1. Research Assistant: A full-time project coordinator is needed to coordinate the data collection, implement the intervention, and assist in data analysis. A total cost of HK$ 268200 was estimated according to our university's pay structure (HK$14900/months for 18 months).
2. Payment to student helpers: we will need 4 student helpers in outcome measurements (height, weight, waist circumference, waist-to-height ratio, and % body fat) and implementation of the intervention. The hourly payment rate is HK$49/hour, each student will work 10 months (at a rate of 1 hour/session, 2 sessions/week, and 4 weeks/months, totally 80 hours/student helper), generating a total cost of HK$ 15680.
3. Incentives for participants: in order to increase the participation rate and decrease the attrition rate, a token incentive of a HK$100 coupon (e.g. supermarket coupon) will be given to the participants competing the whole study. Thus, a total cost of HK$6400 was estimated. In addition, rewards (e.g. stickers) will be given to the participants who complete each intervention session (a total of 72 sessions). A total of HK$2000 was then estimated. *Governance system*: We will purchase coupons and stickers via the Finance Office (FO) of our university. We will ask a parent/guardian of each participant sign on the record sheet for receiving a coupon of HK$100. The FO will monitor the disbursement of incentives to ensure accountability and traceability.
4. Conference: we will present our findings on at least an international conference. A total cost of HK$10000 was then estimated.
5. Publication costs: We will publish at least one article in an international

peer-reviewed journal. We want it to be open access and freely available online. Open access publishing is a charged service. For example, a quality journal levies an article-processing charge of USD2785 (around HKD 21723) for each article accepted for publication. A total cost of HK$20000 was then estimated.

6. Transportation cost: the research staff will travel between schools and office to implement the intervention. A total cost of HKD 8640 was estimated, at a rate of HKD30/travel, 72 travels/person, and 4 persons).

(ii) Estimated revenue or recurrent income (if any) to offset the expenditure of the project

Nil

(iii) Supplementary sponsorship (monetary or non-monetary) (if any) to cover any expenditure or resource requirement of the project

Nil

(g) Purpose and Potential:

(i) How will this project enhance your community's capacity to promote health in the long run

We expected that our programme, if effective, would be welcomed and adopted by other special schools to reduce obesity among their students in the future. We hold close collaborative relationship with many special schools, we have many alumnus working in the special schools, and we therefore could promote our programme via those links if it is effective. In addition, the effective model can also be extended to reach students with ID in normal schools. We will disseminate our findings by presenting on international conferences, publishing journal articles, and building up online platforms for learning and sharing to achieve as large benefits as possible. In the long run, we will equip our undergraduates with the effective APA programme, which they will bring to their receiving schools during internship and to their working schools after graduation.

(ii) How the project can be sustained after the funding period

The APA programme will be designed and implemented by researchers and PE teachers together. If it is effective, the participating schools can independently run the APA programme after the funding period. Upon the completion of the project, we will building up and maintain online platforms via Facebook/Instagram with all deliverables generated from the project. The platforms can be accessed for free by teachers, parents, and other publics to learn and share experiences in obesity interventions. In addition, we will integrate the programme into our courses. Thus, our students can continue delivering the APA programme in the long run.

(h) Key References:

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(i) Timetable of work

Time (months after project commencement)	Key Milestones	Deliverables
Example: 6 months	Completion of participant recruitment	List of enrolled participants
2 months	Preparation (literature review, development of intervention plan and data collection tools)	Questionnaires, draft implementation plan and manual
1 month	Recruitment of participants and pilot study, pre-intervention measurements	School list, participant list, implementation plan and manual
9 months	Intervention, post-intervention measurement	Data and intervention records
3 months	Data entry, data analysis	Dataset
3 months	Report and paper writing	Final report, finalised manual, conference paper, journal article