

BMJ Open Use of a positive psychology intervention (PPI) to promote the psychological well-being of children living in poverty: study protocol for a feasibility randomised controlled trial

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ABSTRACT

Introduction Poverty has a detrimental influence on psychological well-being of children. Existing evidence shows that positive psychology interventions are possible to mitigate such impact. Despite criticisms that positive psychology resembles a scientific Pollyannaism that promotes overly positivity, positive psychology is not the scientific Pollyannaism that denies the difficulties and emotions that people may experience. Whereas, positive psychology acknowledges the difficulties and emotions, alongside with building up human resilience, strength and growth to face adversity. This study examined the feasibility of implementing a positive psychology intervention among Hong Kong Chinese children living in poverty.

Methods A feasibility randomised controlled trial will be conducted. A convenience sample of 120 children aged 13–17 years will be recruited from a community centre in Kwai Tsing district. Participants who are randomised into the experimental group will join a 1.5-hour workshop covering four positive psychology techniques: (1) gratitude visits/letters, (2) three good things, (3) you at your best and (4) using signature strengths. A booster intervention will be provided at 1 week. Control group participants will not receive any intervention. Assessments will be conducted at baseline and at 1-week, 1-month, 3-month and 6-month follow-ups.

Analysis Descriptive statistics will be used to calculate the feasibility measures. Effect sizes on psychological outcomes (ie, self-esteem, depressive symptoms and quality of life) will be estimated by mixed between-within subjects analysis of variance using partial eta squared with poverty (yes, no) entering into the model as a factor.

Ethics and dissemination Ethical approval has been obtained from the Hong Kong Polytechnic University Institutional Review Board. We will obtain parental consent as our subjects are below 18 years old. Findings from this study will be disseminated via international publications and conferences.

Trial registration number NCT04875507.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This is the first study to explore the primary efficacy of a positive psychology intervention in promoting the psychological well-being of children living in poverty.
- ⇒ Qualitative evidence will be collected as additional evidence to determine the feasibility of using this intervention in the community.
- ⇒ A large-scale randomised controlled trial is needed to further determine the intervention effectiveness.

INTRODUCTION

Poverty is a major social determinant of health disparity in children, and has a detrimental influence on health at every stage of human life.¹ When compared with children from high-income families, those from low-income families have more disadvantaged health outcomes, including low birth weight,² premature death,³ delayed language development,⁴ chronic diseases,⁵ health-compromising behaviours⁶ and malnutrition.⁶

The impact of poverty also extends to psychological aspects.^{7–10} A meta-analysis indicated that low socioeconomic status was associated with low self-esteem among children.⁸ A longitudinal study found that children from low-income families exhibited more depressive symptoms than those from high-income families.⁹ There is a large body of evidence showing that low self-esteem is a predisposing factor for various mental and behavioural problems.¹¹ A population-based study showed that adolescents with depressive symptoms more easily developed health-compromising behaviours, particularly smoking and drinking, which are modifiable risk factors for multiple chronic diseases in adulthood.¹² Given the devastating impact



of poverty on children's psychological well-being, interventions are required to prevent associated health consequences throughout the lifespan.

Currently, around 663 million children live in poverty globally.¹³ With reference to the Healthy People 2030 Framework, measures are needed to ensure health equity.¹⁴ Although Hong Kong is an affluent city, the overall poverty rate was 20.4% in 2018, meaning that one in every five people lived in poverty.¹⁵ Child poverty is a serious concern, as the poverty rate for people aged below 18 years was 23.1% in 2017. Despite recurrent cash being distributed, the poverty rate remained at 17.5%, which presents an alarming situation.¹⁶ This problem became even more serious in the COVID-19 outbreak. At present, the unemployment rate is 6.2%, which is the highest in more than 15 years.¹⁷ However, the current adversity will disproportionately affect low-income families. A survey of 309 adults from low-income families found that 38% were out of work, 21% had to take unpaid leave and more than 80% were expected to encounter financial difficulties within 3 months.¹⁷ Children from low-income families are therefore expected to experience more disruptions in their routines and receive less resources than other children, which will magnify the psychological consequences of poverty.

To mitigate the psychological impacts of poverty, governments in various places have adopted various measures to improve children's access to healthcare and social services.¹⁸ However, a review noted that governments have emphasised addressing poverty at the country level but neglected to build children's personal attributes, thereby reducing their capacity to cope with psychological distress resulting from poverty.¹⁸ Previous studies reported several existing interventions that can promote psychological well-being among children living in poverty.^{19–21} These interventions included musical training,¹⁹ art enrichment programmes²⁰ and adventure-based training.²¹ Although participants demonstrated improvements in their psychological health,^{19–21} these interventions had limitations that undermined large-scale implementation. First, these interventions involved many sessions spreading over months or years.^{19–21} This limited their feasibility, especially as most Hong Kong children engage in many academic and extracurricular activities. Second, these interventions were implemented by professional trainers, which was costly^{19–21} and meant the interventions were not sustainable when the funding was exhausted. Third and perhaps most importantly, these interventions aimed to reduce negative emotions, but did not change children's mindsets to perceive their lives positively.^{19–21} Therefore, they may experience repeated feelings of depression because poverty is a problem that cannot be resolved in the short-term.²² It is crucial to develop an intervention to change children's perceptions of poverty and their lives, with the ultimate goal of promoting their psychological well-being and quality of life (QoL). Such an intervention must be short and involve few sessions so that it is feasible to implement.

Positive psychology is the study of factors that contribute to a meaningful life.²³ Unlike traditional psychology that focuses on negative emotions, positive psychology emphasises achieving happiness through fostering positive attitudes toward one's subjective experiences and life events.²⁴ Biswas-Diener²⁵ noted that it may mitigate the psychological impact associated with poverty. They argued that poverty is a life event that triggers negative emotions that obstruct people from achieving their full potential. However, using positive psychology techniques to change the way people think means people can identify some aspects of life that warrant happiness, notwithstanding their impoverished circumstances.²⁵ This was demonstrated in a study involving 186 homeless people in California, USA. Despite their experience of poverty and homelessness, participants reported relatively frequent episodes of joy and satisfaction in various life domains.²² King and colleagues also concluded that identifying meaning in life difficulties was a key to positive functioning and happiness.²⁶

Positive psychology interventions (PPIs) use positive psychology techniques to identify meanings and values in life events to raise positive feelings and emotions.²⁷ Unlike traditional psychotherapies, PPIs are brief with only a few sessions.²⁷ In addition, instructions for PPIs are simple and easy-to-follow, and can be self-administered or implemented by laypeople.²⁷ Application of PPIs has steadily increased in clinical and non-clinical samples.^{28–30} The effectiveness of PPIs in promoting psychological well-being and ameliorating depressive symptoms was supported by a meta-analysis of 71 primary studies.²⁷ However, that meta-analysis did not include any study in a Chinese population, and it remains unclear whether PPIs are applicable in the Hong Kong Chinese context. Unlike many Western societies that place high priority on the pursuit of happiness, Hong Kong society is deeply influenced by fatalism. This emphasises that life events are fated and cannot be changed, meaning people tend to accept life events as their destiny and refrain from expressing negative emotions.³¹ Lopez *et al*³¹ argued that it is crucial to re-examine the effectiveness and feasibility of PPIs among Hong Kong Chinese because of the differences in ways of thinking. However, before conducting a full trial, we need to ensure the feasibility of PPIs in this population group and calculate the effect size of the intervention. As such, our research question is: what is the feasibility and preliminary efficacy of the PPI in promoting the psychological well-being among the Hong Kong Chinese children living in poverty. To address the gap in existing literature, the first objective of this trial is to examine the feasibility of implementing the PPI among the Hong Kong Chinese children living in poverty. Feasibility will be assessed by screening rate, eligibility rate, recruitment rate, randomisation rate, intervention attendance rate, adherence to the intervention protocol, retention rate, completion rate, missing data and adverse events. The second objective is to calculate the effect sizes of the PPI on psychological well-being (ie,

self-esteem and depressive symptoms) and QoL for this population group.

Theoretical framework

PPIs were developed based on the PERMA theory developed by Seligman³² who defined happiness as a multifaceted construct containing five factors: Positive emotion, Engagement, Relationships, Meaning and purpose and Accomplishment. Positive emotion includes joyfulness and comfort from the most basic ways (eg, eating ice cream). The second factor is Engagement, which can be achieved by concentrating on something a person genuinely enjoys and values. The third factor is Relationships. Humans are social beings, and building positive connections with others is considered a way to spread love and joy, thereby achieving well-being. The fourth factor is Meaning, which refers to a personal commitment to something that provides a sense of transcendence. The last factor is Achievement, which reflects a sense of satisfaction that comes from successfully completing a task or achieving a goal. This theory considers these five factors as central to well-being; PPIs are interventions that make use of different techniques to promote these five factors to achieve well-being.

Fordyce³³ identified 14 exercises that can promote these factors. Schueller and Parks³⁴ found that increasing the number of positive psychology exercises in an intervention was beneficial because this could enhance participants' adherence to the taught exercises without increasing dropout. In this study, we will include four positive psychology exercises: (1) Gratitude visits/letters, where people write and deliver a letter of gratitude to someone who has been particularly kind or helpful in the past, but who was never suitably thanked. (2) Three good things, where people write down three good things that happen each day and identify the reasons why they go well. (3) You at your best, where people write a story of when they were at their best, identify their personal strengths in the story and review these strengths. (4) Using signature strengths, where people identify their top five character strengths using the Character Strengths Inventory, which contains 24 positive characteristics that are universal to human beings. After completion, people receive a note that contains feedback based on the five identified character strengths. Finally, people are instructed to select one of their top five strength character strengths, and use a new way to express that strength each day. These four exercises are chosen because their effectiveness in promoting happiness was previously validated by Seligman *et al.*²³ By practicing these four techniques, people can identify their personal strengths and change their perceptions of themselves, thereby achieving well-being even under impoverished circumstances.²³

METHODS

Study design

We will adopt a cluster, randomised controlled trial design. This trial will be conducted in two secondary schools around Kwai Chung Estate, which is the largest

public housing estate in Hong Kong located in the second poorest district in Hong Kong.^{7,21} Figure 1 shows the Consolidated Standards of Reporting Trials diagram of this trial.

Sample

Both children living in poverty or not in poverty will be recruited to avoid labelling and self-stigma. We will recruit a total of 120 participants; 60 for the experimental group and 60 for the control group. Based on previous literature, a minimum sample size of 20 participants is considered adequate to pilot the feasibility of an intervention.³⁵ Participants will be stratified based on their families' economic status (poverty vs non-poverty) to balance experimental and control groups on this key demographic variable. Hence, each group will contain 30 participants living in poverty and 30 who are not in poverty. Participants will be defined as living in poverty if their families are receiving Comprehensive Social Security Assistance or with a household income less than the half of the Hong Kong median income, and vice versa.^{7,10} We adopt this definition because it is widely accepted in developed countries.^{7,10}

To be eligible, the participants must be aged 13–17 years, and able to speak Cantonese and read Chinese. We targeted this age group because there is a dramatic drop in self-esteem from childhood to adolescence.³⁶ In addition, Erikson³⁷ suggested that those aged 13–17 years struggle to fit into a social circle. Therefore, poverty may have a greater impact on adolescents because of social comparisons.³⁸ Children younger than 13 years are also impacted by poverty; however, their psychological needs differ from those of older children.³⁷ To ensure the homogeneity of our participants, we will only recruit those in the adolescent stage. To minimise confounders, we will exclude children with identified cognitive and/or behavioural problem(s). Also, we will exclude children with identified mental problem(s), or those participating in any mental health service/programme and/or receiving any psychiatric medication.

Intervention

Experimental group

Participants will receive a 1.5-hour workshop covering positive psychology techniques delivered by a research assistant (RA). The RA will complete training given by the research team. The workshop will be conducted in groups of ≤5 participants. Since our PPI only aims to assist children to identify meaning and value in life,²⁷ we will not tailor any input that is relevant to their socioeconomic circumstance. The intervention content will be adopted from that validated by Seligman *et al.*²³ The intervention contains four established techniques: gratitude visits/letters, three good things, you at your best and using signature strengths (see the theoretical framework). Participants will be asked to practice these techniques every night for 1 week. They will be reminded to continue practicing when feeling down, and will also receive an

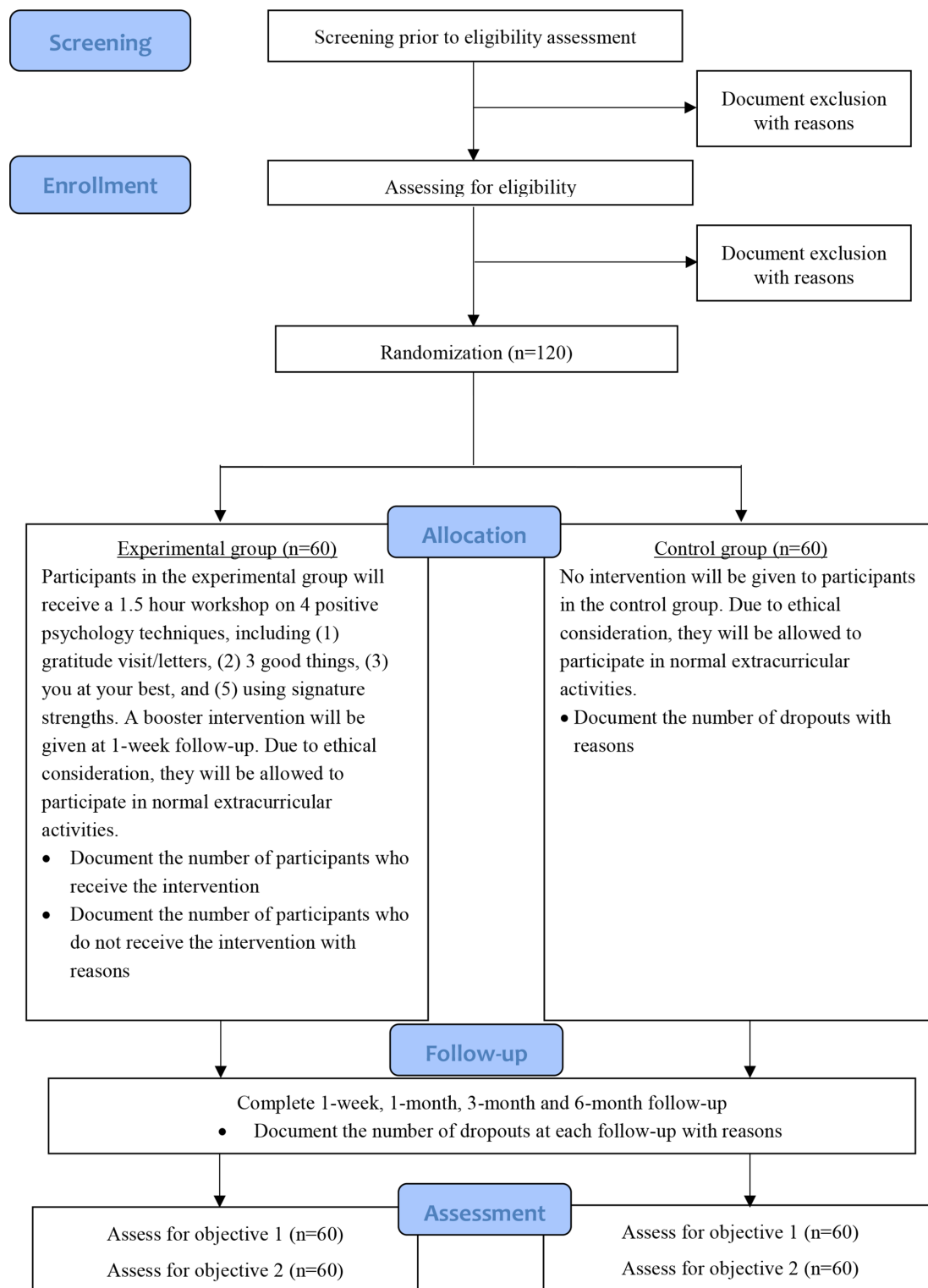


Figure 1 Consolidated Standards of Reporting Trials diagram.

education card containing these techniques. Seligman *et al.*²³ observed that the intervention effect decreased at 1 week. Therefore, a booster intervention will be delivered by the RA at a 1-week telephone follow-up. The RA will ask participants about their experiences of using the techniques. If participants adhered to the intervention, the RA will praise them, and remind them to continue. If participants did not practice, the RA will explore any

reasons and emphasise the benefits of using these techniques. The whole booster process should last around 15 min.

Control group

No intervention will be given because we would like to maximise the differences between the two groups.³⁹

Intervention integrity

First, the intervention will be implemented by the same RA. Second, the RA will receive a 1-day training workshop delivered by the research team. The principal investigator will explain the study in detail to the RA, and a psychiatrist will teach the RA how to deliver the PPI. Third, 10% of the intervention will be randomly chosen for audio-recording. The research team will listen to the audiotapes to ensure that the RA adhered to the intervention protocol. Finally, weekly research meetings will be held to monitor progress.

Outcomes

Primary outcomes are screening rate, eligibility rate, consent rate, randomisation rate, intervention attendance rate, adherence to the intervention protocol at 1 week, retention rate at the 6-month follow-up, completion rate at 6 months, missing data and adverse events.

Secondary outcomes are the preliminary efficacy effect sizes of the PPI and its effect size on self-esteem, depressive symptoms and QoL at 6 months. Seligman *et al*²³ suggested that 6 months is a reasonable time frame to evaluate the long-term effectiveness of PPIs.

Measurement

Screening rate

The number of children screened by the RA divided by the number of children available for screening during the recruitment period.

Eligibility rate

The number of eligible children divided by the number of screened children.

Consent rate

The number of eligible children who consent to participate divided by the number of eligible children.

Randomisation rate

The number of children randomised to the experimental and control groups divided by the number of consenting children.

Intervention attendance rate

The number of participants in the experimental group who complete the intervention will be divided by the number of participants randomised into the group. This will be calculated separately for the intervention and booster.

Adherence to the intervention protocol

The number of participants in the experimental group who practice the skills gained will be divided by the number of participants randomised into the group. This will be calculated at each follow-up.

Retention rate

The number of participants who remain in this study will be divided by the number of randomised participants, calculated by group at each follow-up.

Completion rate

The number of participants who return the questionnaires will be divided by the number of questionnaires distributed. This will be calculated by groups at baseline and each follow-up.

Missing data

It is the percentage of missing in the data set. Unknown or blank values will be regarded as missing.

Adverse events

Adverse events are defined as unfavourable and unintended events that are absent from baseline, or appear to worsen from baseline during the study period. Relatedness to the study will be assessed by the research team, and the number and severity of adverse events will be recorded.

The Chinese version of the Rosenberg Self-Esteem Scale

This scale will be used to assess participants' self-esteem. It contains 10 items, with higher scores representing higher self-esteem. This scale was previously validated and has been widely applied in paediatric research.^{7 21}

The Chinese version of the Center for Epidemiologic Studies Depression Scale for Children

This 20-item scale will be used to assess participants' depressive symptoms. Higher scores indicate more depressive symptoms. This scale was previously validated in Hong Kong Chinese children.^{7 21}

The Chinese version of the Paediatric Quality of Life Inventory

This tool will be used to assess participants' QoL. It contains four subscales: physical functioning, emotional functioning, social functioning and school functioning. Participants will be asked to rate each item on a 5-point scale, with higher scores representing better QoL. This scale was previously validated in the Hong Kong Chinese context.^{7 21}

A semi-structured interview guide

This interview guide was developed by the research team. It is divided into child and parent versions. Each version covers six important topics, including (1) general experience of participation, and the thoughts on (2) the PPI, (3) the educational card, (4) booster intervention, (5) perceived usefulness and (6) follow-up.

Demographic sheet

A demographic sheet will be used to collect the following information, including sex, age, household size and income, types of housing, parental education attainment, number of siblings and religious.

Randomisation, blinding and concealment

Cluster randomisation will be adopted. The randomisation unit is school. The two schools will be randomly allocated into either the experimental group or control group by random drawing of marked pieces of paper by an RA who is not otherwise involved in this study.



According to our previous research work,²¹ each class of the schools contains around 30 students. Since we target to recruit 60 for each group, three classes will be required from each school to identify sufficient number of eligible children for this study based on our conservative estimation. Hence, one class will be randomly chosen in every alternative year of study, that is, secondary 1, 3 and 5.

If we are unable to recruit sufficient number of participants for each stratum (poverty and non-poverty), more classes will be randomly chosen from the schools. On the contrary, if the quota for the respective stratum is met, intervention will still be provided for eligible children due to ethical consideration. However, they will not be counted as the participants of this study. Blinding will not be possible as the PPI is not usual care, and all instruments used are self-reported.

Contamination

Since the study will be conducted in two schools, with one being randomised into the experimental group and another as the control, the possibility of contamination has been greatly reduced. Also, we will explain to the participants that they are joining the study, and remind them that they should not discuss the intervention content with other children as information sharing may affect the accuracy of our obtained results. When the children sign the assent form, we will remind them that such a process signifies that they agree not to share the intervention content until the study is completed. However, we will not restrict them to share their feelings and record in relation to the intervention to their parents and families. This is also a common practice for studies in the field.^{40 41} Because of ethical considerations, all participants will be able to join extracurricular activities. To monitor extraneous variables, participants will be asked to report any participation in extracurricular activities on psychosocial skills at each follow-up.

Data collection

An invitation letter containing study information will be randomly sent to two secondary schools around Kwai Chung Estate. If there is no response or the secondary schools refuse to participate, more invitation letters will be sent to other schools in Kwai Chung districts. The two school principals and responsible teachers will be thoroughly explained about the study's details, including its aim and procedures. Before obtaining written consent, parents of the chosen classes will receive detailed information about the study. Children will be invited to write their names on a child assent form. However, to avoid labelling and self-stigma, both children and parents will be told that this study aims to investigate the feasibility and preliminary efficacy of the PPI to promote the psychological well-being of school children, instead of children living in poverty. Parents who allow their children to participate will be asked to return the written consent together with a completed demographic sheet which contains their families' economic status to assist

the stratification (poverty vs non-poverty). Participants in both the experimental group will be asked to complete the questionnaire at baseline, and at 1 week, 1 month, 3 months and 6 months after the intervention via telephone. Those in the control group will also be assessed at the same time points. Seligman *et al.*²³ suggested that a proposed follow-up schedule helps to monitor participants' PPI practice and their psychological outcomes.

To further examine the feasibility of the PPI, poor children in the experimental group and their parents will be purposively chosen as informants to receive a 20–30 min, individual semi-structured interview conducted by the RA based on intervention adherence. The RA will identify children with good (eg, 80%–100%)/bad (eg, 0%–20%) intervention adherence, and contact their parents to invite them to participate in an interview. The interview will be conducted in an interview room of a local university using a semi-structured interview guide. Probing questions will be asked to solicit more information. The whole process will be audio-recorded, and field notes will be taken by the RA. Data collection will end when data saturation is reached. Numbers and reasons of refusal for the interview will be documented.

Data analysis

To examine the feasibility of the PPI, quantitative and qualitative data will be collected. We will follow the guideline proposed by Venkatesh *et al.*⁴² on how to conduct mixed-method research. We will adopt a sequential quantitative–qualitative data analysis. The scope of this analysis approach is to use the results from qualitative data analysis to interpret and clarify the results obtained from quantitative data analysis.⁴³ For quantitative data, descriptive statistics will be used to calculate screening rate, eligibility rate, recruitment rate, randomisation rate, intervention attendance rate, adherence to the intervention protocol, retention rate, completion rate, missing data and adverse events. To understand how feasibility of the PPI will be moderated by poverty, feasibility measures will be separately calculated for children living in poverty and those who are not in poverty. Qualitative data will be analysed by content analysis which aims to identify patterns and structures to describe what is said on a given subject in a given place at a given time.⁴⁴ Content analysis is different from phenomenology for capturing people's lived experience,⁴⁵ ethnography for gaining access to the health beliefs and practices of a culture⁴⁶ and grounded theory for expanding explanation of a phenomenon.⁴⁷ We will conduct content analysis based on the recommendation by Erlingsson and Brysiewicz.⁴⁸ All interviews will be transcribed immediately and the transcripts will be returned to the informants for comment. Two research team members will read the transcripts separately and repeatedly to gain a general sense of the data. Important statements will be identified and extracted as meaningful units. These meaningful units will then be condensed with their core meanings retained. These condensed meaning units will be labelled and grouped into codes. Codes

will be compared, appraised and sorted into categories based on their connections into the same issue. The categories will eventually be abstracting into a higher level, that is, themes which illustrate an overarching meaning by answering the questions, such as why, how, in what way and by what means. Any discrepancy in the interpretations between the two researchers will be resolved in research meetings. These findings will then be returned to the informants for comment and refinement. We will follow the Consolidated criteria for Reporting Qualitative research checklist when reporting the qualitative results. A coding frame will be presented, and quotations added to illustrate the identified themes. Descriptions of minor themes will be provided.

Quantitative data will be used to calculate the effect sizes of the PPI on depressive symptoms, self-esteem and QoL. Comparability of the baseline data between the experimental and control groups will be examined with independent-samples t-tests for continuous data and χ^2 tests for categorical data. The effect sizes of the PPI on the outcomes will be determined by mixed between-within subjects analysis of variance using partial eta squared with poverty (yes, no) entering into the model as a factor.

Ethical and dissemination

Ethical approval (HSEARS20210325001) has been received from the Human Subjects Ethics Subcommittee of the Hong Kong Polytechnic University. This study will be registered in ClinicalTrials.gov. As this study involves no invasive procedures, any physical harm posed by the study will be minimal. To manage any ethical issues that may occur, participants and their parents will be given contact details for the principal investigator. They will be advised to contact the principal investigator if they have any negative feelings in research. In such case, we will provide appropriate advice for participants and their parents who show transient emotional episodes arising from research. For participants with emotional responses associated with other reasons, for example, economic hardship, the principal investigator will make referral to a social worker who possess the expertise with the support from a non-governmental organisation that will provide long-term follow-up. This is also a common practice for studies in this field.^{49 50} A leaflet containing self-help materials will be given to participants and their parents.

Patient and public involvement

There is no patient and public involvement.

DISCUSSION

This study will bridge the gap in existing literature by determining the feasibility of implementing a PPI among Hong Kong Chinese children living in poverty. If the PPI is found to be feasible, a large-scale randomised controlled trial will be conducted to determine the overall effectiveness of the PPI in promoting psychological well-being and QoL among Hong Kong Chinese living in poverty.

Given the distinctive advantages of PPIs (ie, low-cost, brief with only a few sessions and delivery by laypeople with minimal training), it is expected that our intervention may be implemented extensively in the community by non-governmental organisations and schools, and bring psychological benefits to children living in poverty.

Strengths and limitations of this study

The major strength of this study lies in the originality by exploring the primary efficacy of a PPI in promoting the psychological well-being of children living in poverty. The second strength is that this study embraces the shift to positive psychology 3.0. In fact, the field of positive psychology has been changing from 1.0 which sets foundational notion of positive to now 3.0 that emphasises on increasing the complexity, especially in terms of methodologies and ecological factors.⁵¹ This change also echoes with the contemporary model of well-being which takes into account the interconnectedness of individual in relation to their community and environment, and highlights the impacts of socio-contextual factors, for example, inequality which influence well-being.^{52 53} To address the shift, our proposed study will adopt a mixed-method approach in data collection. This is different from 1.0 that have been dominated by quantitative evidence and enhances the complexity of methodology.⁵³ The third strength of this study is that poverty (two levels: yes or no) will be entered into the analysis to determine how such factor will moderate the effectiveness and feasibility of the PPI intervention, given that economically disadvantaged in society is recognised as one of the key socio-contextual factors impacting on the well-being.⁵⁴

Likewise, several potential limitations of the protocol outlined here deserve mention as well as our responses to these limitations. First, our intervention will not address socio-structural factors contributing to poverty. This is because, PPIs aim to cultivate positive emotions and assist people to re-establish life purpose,^{55 56} instead of targeting the root cause, such as trauma and inequality. This is also in-line with most existing PPIs that targeted on specific population groups with various mental health issues.^{57–59} Second, Yakushko⁶⁰ argued that positive psychology is akin to promote scientific Pollyannaism which overly enforces positivity. This term was originated from a children's book, named Pollyanna, which describes an orphan girl who manages the pernicious effects of loss, abuse and social prejudice with glad games taught by her father. This book has attracted criticisms because this character presents unfailingly optimistic outlook which pathologises humans' normal reactions (eg, distress and sorrow) to traumatic or oppressive social contexts. In fact, positive psychology is not scientific Pollyannaism which denies the difficulties and emotions that people may experience.⁶¹ Whereas, positive psychology acknowledges the difficulties and emotions, alongside with building up human resilience, strength and growth to face adversity,⁶² with an ultimate goal, as a health advocator, to

eradicate socio-structural factors which lead to trauma and inequalities.⁶³

Recent research has shown that children from families living in poverty face tremendous stress in everyday living, which makes them three times more likely to develop psychiatric conditions (eg, aggressive behaviours, depression and anxiety) in adulthood than other children. Through improving the psychological well-being of children living in poverty using PPI, we may be able to save healthcare costs attributable to such conditions that may occur in adulthood. In addition, through empowering children living in poverty to develop a positive thinking, we can assist them to achieve their full potential and enable them to serve as future pillars of society.

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REFERENCES

- World Health Organization Poverty and Health. Social determinants of health, 2020. Available: <https://www.who.int/hdp/poverty/en/> [Accessed 22 January 2020].
- Strully KW, Rehkopf DH, Xuan Z. Effects of prenatal poverty on infant health: state earned income tax credits and birth weight. *Am Sociol Rev* 2010;75:534–62.
- Klerman LV. The health of poor children: Problems and programs. In: Huston A, ed. *Children and poverty: child development and public policy*. New York: Cambridge University Press, 1991: 136–57.
- Perkins SC, Finegood ED, Swain JE, Poverty SJE. Poverty and language development: roles of parenting and stress. *Innov Clin Neurosci* 2013;10:10–19.
- Pulcini CD, Zima BT, Kelleher KJ, et al. Poverty and trends in three common chronic disorders. *Pediatrics* 2017;139:e20162539.
- Gupta RP-S, de Wit ML, McKeown D. The impact of poverty on the current and future health status of children. *Paediatr Child Health* 2007;12:667–72.
- Ho KY, Li WHC, Chan SSC. The effect of poverty and income disparity on the psychological well-being of Hong Kong children. *Public Health Nurs* 2015;32:212–21.
- Twenge JM, Campbell WK, Self-Esteem. And socioeconomic status: a meta-analytic review. *Pers Soc Psychol Rev* 2002;6:59–71.
- Tracy M, Zimmerman FJ, Galea S, et al. What explains the relation between family poverty and childhood depressive symptoms? *J Psychiatr Res* 2008;42:1163–75.
- Ho KY, Li WHC, Chung JOK, et al. Factors contributing to the psychological well-being for Hong Kong Chinese children from low-income families: a qualitative study. *Int J Ment Health Syst* 2016;10:56.
- Leary MR, Schreindorfer LS, Haupt AL. The role of low self-esteem in emotional and behavioural problems: why is low self-esteem dysfunctional? *J Soc Clin Psychol* 1995;14:297–314.
- Simantov E, Schoen C, Klein JD. Health-compromising behaviors: why do adolescents smoke or drink?: identifying underlying risk and protective factors. *Arch Pediatr Adolesc Med* 2002;154:1025–33.
- Unicef. Child poverty, 2020. Available: <https://www.unicef.org/social-policy/child-poverty> [Accessed Access 22 January 2020].
- Office of Disease Prevention and Health Promotion. Social determinants of health, 2020. Available: <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health> [Accessed Access 22 January 2020].
- Census and Statistics Department. Poverty situation, 2019. Available: <https://www.censtatd.gov.hk/hkstat/sub/so461.jsp> [Accessed 22 January 2020].
- Census and Statistics Department. Hong Kong poverty situation report 2017, 2018. Available: [https://www.povertyrelief.gov.hk/eng/pdf/Hong_Kong_Poverty_Situation_Report_2017\(2018.11.19\).pdf](https://www.povertyrelief.gov.hk/eng/pdf/Hong_Kong_Poverty_Situation_Report_2017(2018.11.19).pdf) [Accessed January 22, 2020].
- Hong Kong Confederation of Trade Union. 85% Workers in Hong Kong Affected by COVID-19! HKCTU Proposes Cash Allowance to Workers NOW!!! 2020. Available: <https://en.hkctu.org.hk/content/85-workers-hong-kong-affected-covid-19-hkctu-proposes-cash-allowance-workers-now> [Accessed 4 September 2020].
- Wahlbeck K, Cresswell-Smith J, Haaramo P, et al. Interventions to mitigate the effects of poverty and inequality on mental health. *Soc Psychiatry Psychiatr Epidemiol* 2017;52:505–14.
- Cheung AT, Li WHC, Ho LLK, et al. Effectiveness of a musical training programme in promoting Happiness and quality of life of underprivileged preschool children. *J Clin Nurs* 2019;28:4412–23.
- Brown ED, Sax KL. Arts enrichment and preschool emotions for low-income children at risk. *Early Child Res Q* 2013;28:337–46.
- Li WHC, Chung JOK, Ho EKY. Effectiveness of an adventure-based training programme in promoting the psychological well-being of primary schoolchildren. *J Health Psychol* 2013;18:1478–92.
- Biswas-Diener R, Diener E. The subjective well-being of the homeless and lessons for Happiness. *Soc Indic Res* 2006;76:185–205.
- Seligman MEP, Steen TA, Park N. Positive psychology progress: empirical validation of interventions. *Am Psychol* 2005;60:410–21.
- Seligman ME, Csikszentmihalyi M. *Positive psychology: an introduction*. Netherlands: Springer, 2014.
- Biswas-Diener R. *Positive psychology as social change*. New York: Springer, 2001.
- King LA, Hicks JA, Krull JL, et al. Positive affect and the experience of meaning in life. *J Pers Soc Psychol* 2006;90:179–96.
- White CA, Utti B, Holder MD. Meta-Analyses of positive psychology interventions: the effects are much smaller than previously reported. *PLoS One* 2019;14:e0216588.
- Andrewes HE, Walker V, O'Neill B. Exploring the use of positive psychology interventions in brain injury survivors with challenging behaviour. *Brain Inj* 2014;28:965–71.
- Nikrahan GR, Suarez L, Asgari K, et al. Positive psychology interventions for patients with heart disease: a preliminary randomized trial. *Psychosomatics* 2016;57:348–58.
- Schueller SM. Promoting wellness: integrating community and positive psychology. *J Community Psychol* 2009;37:922–37.
- Lopez SJ, Pedrotti JT, Snyder CR. *Positive psychology: the scientific and practical explorations of human strengths*. California: SAGE Publication, 2014.
- Seligman MEP. *Authentic Happiness: using the new positive psychology to realize your potential for lasting fulfillment*. New York, NY: Free Press, 2002.
- Fordyce MW. Development of a program to increase personal Happiness. *J Couns Psychol* 1977;24:511–21.
- Schueller SM, Parks AC. Disseminating self-help: positive psychology exercises in an online trial. *J Med Internet Res* 2012;14:e63.
- Whitehead AL, Julious SA, Cooper CL, et al. Estimating the sample size for a pilot randomised trial to minimise the overall trial sample size for the external pilot and main trial for a continuous outcome variable. *Stat Methods Med Res* 2016;25:1057–73.

- 36 Robins RW, Trzesniewski KH, Tracy JL, *et al*. Global self-esteem across the life span. *Psychol Aging* 2002;17:423–34.
- 37 Erikson E. *Identity: youth and crisis*. New York: W. W. Norton & Company, 1968.
- 38 Wilkinson RG. *Unhealthy societies: the afflictions of inequality*. London, New York: Routledge, 1996.
- 39 Polit D, Beck CT. *Essentials of nursing research appraising evidence for nursing practice*. 10th Edition. Philadelphia: Wolters Kluwer, 2022.
- 40 Stamp E, Schofield H, Roberts VL, *et al*. Contamination within trials of community-based public health interventions: lessons from the Henry feasibility study. *Pilot Feasibility Stud* 2021;7:88.
- 41 Magill N, Knight R, McCrone P, *et al*. A scoping review of the problems and solutions associated with contamination in trials of complex interventions in mental health. *BMC Med Res Methodol* 2019;19:4.
- 42 Venkatesh V, Brown S, Sullivan Y, *et al*. Guidelines for conducting mixed-methods research: an extension and illustration. *J Assoc Inf Syst* 2016;17:435–94.
- 43 Edmonds WA, Kemmedy TD. *An applied guide to research design: quantitative, qualitative, and mixed methods*. thousand oak. CA: Sage, 2017.
- 44 Macnamara J. Content analysis. In: Napoli P, ed. *Mediated communication*. Berlin, Germany and Boston, MA: de Gruyter Mouton, 2018: 191–212.
- 45 Mapp T. Understanding phenomenology: the lived experience. *Br J Midwifery* 2008;16:308–11.
- 46 Robertson MH, Boyle JS. Ethnography: contributions to nursing research. *J Adv Nurs* 1984;9:43–9.
- 47 Chiovitti RF, Piran N. Rigour and grounded theory research. *J Adv Nurs* 2003;44:427–35.
- 48 Erlingsson C, Brysiewicz P. a hands-on guide to doing content analysis. *Afr J Emerg Med* 2017;7:93–9.
- 49 Berman RS, Patel MR, Belamarich PF, *et al*. Screening for poverty and Poverty-Related social determinants of health. *Pediatr Rev* 2018;39:235–46.
- 50 Mathew G, Ramesh N, Shanbhag D, *et al*. Quality of life and probable psychological distress among male workers at a construction site, Kolar district, Karnataka, India. *Indian J Occup Environ Med* 2016;20:54–9.
- 51 Lomas T, Waters L, Williams P. Third wave positive psychology: broadening towards complexity. *J Posit Psychol* 2021;16:660–74.
- 52 Mead J, Fisher Z, Kemp AH. Moving beyond disciplinary silos towards a Transdisciplinary model of wellbeing: an invited review. *Front Psychol* 2021;12:642093.
- 53 Lomas T, Hefferon K, Ivtzan I. The life model: a Meta-Theoretical conceptual map for applied positive psychology. *J Happiness Stud* 2015;16:1347–64.
- 54 Lever JP, Piñol NL, Uralde JH. Poverty, psychological resources and subjective well-being. *Soc Indic Res* 2005;73:375–408.
- 55 Sin NL, Lyubomirsky S. Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: a practice-friendly meta-analysis. *J Clin Psychol* 2009;65:467–87.
- 56 Seligman MEP, Steen TA, Park N, *et al*. Positive psychology progress: empirical validation of interventions. *Am Psychol* 2005;60:410–21.
- 57 Huffman JC, DuBois CM, Healy BC, *et al*. Feasibility and utility of positive psychology exercises for suicidal inpatients. *Gen Hosp Psychiatry* 2014;36:88–94.
- 58 Celano CM, Gomez-Bernal F, Mastromauro CA, *et al*. A positive psychology intervention for patients with bipolar depression: a randomized pilot trial. *J Ment Health* 2020;29:60–8.
- 59 Gander F, Proyer RT, Ruch W. Positive psychology interventions addressing Pleasure, engagement, meaning, positive relationships, and Accomplishment increase well-being and ameliorate depressive symptoms: a randomized, placebo-controlled online study. *Front Psychol* 2016;7:686.
- 60 Yakushko O. *Scientific Pollyannaism: from inquisition to positive psychology*. Cham, Switzerland: Palgrave Macmillan, 2019.
- 61 Peterson C. Positive psychology. *Positive Psychology Reclaiming Children and Youth* 2009;18:3–7.
- 62 Gable SL, Haidt J. What (and why) is positive psychology? *Review of General Psychology* 2005;9:103–10.
- 63 Tal A, Kerret D. Positive psychology as a strategy for promoting sustainable population policies. *Heliyon* 2020;6:e03696.