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Subjective Outcome Evaluation of a Positive Youth Development Program in Mainland China during the COVID-19 Pandemic

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Abstract

Objectives This study aimed to replicate the evaluation findings of a youth program adopting a positive youth development (PYD) approach implemented during the pandemic years of 2020–2021 and 2021–2022 in China mainland using a validated subjective outcome evaluation (SOE) assessment tool.

Methods A 36-item SOE scale was used to investigate participants' evaluation of the quality of the PYD program, the quality of the program implementers, and the perceived program benefits. The data were collected from 3,765 (M_{age} = 13.46, SD = 0.72, 50.4% females) and 2,786 (M_{age} = 16.24, SD = 0.68, 51.7% females) junior and senior high school students, respectively.

Results The SOE scale showed an invariant three-factor structure and adequate validity and reliability. Consistent with previous findings, student participants showed favorable perceptions of the youth program's quality, the quality of the implementers, and the multifaceted benefits of project participation. In addition, senior grade students held more favorable evaluations in comparison to those of junior grade students.

Conclusion In conjunction with previous research conducted before COVID-19, the present findings support the psychometric properties of the SOE scale and the value of the PYD program across different times.

Keywords Youth program · Secondary school students · Pandemic · Program evaluation · Client satisfaction

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Introduction

Mental Health Issues among Chinese Adolescents

Adolescence is a critical transition period from childhood to adulthood and is characterized by rapid physical and psychological development. During this period, individuals undergo significant challenges and are vulnerable to developing various mental health issues (World Health Organization, 2023). For example, depression, anxiety, and substance use disorders commonly emerge in adolescence (Blakemore, 2019). According to a meta-analysis (Polanczyk et al., 2015), the global prevalence of mental disorders (e.g., depression and anxiety) among adolescents was 13.4%. Adolescent mental health issues are a special public concern in China given its largest number of adolescents (171.34 million) in the world (UNICEF Data, 2023). A meta-analysis of 51 studies including 144,060 Chinese secondary school students revealed that the overall prevalence of depressive symptoms was between 21.3% and 27.6% (Tang et al., 2019). Moreover, in China, there were more than 30 million children and adolescents (under the age of 17) struggling with emotional or behavioral maladjustments (UNICEF China, 2020). Besides, adolescents' mental health issues commonly co-occur with other developmental problems, such as delinquency, aggression, and bullying. In addition, mental health disorders (e.g., anxiety and depression) during adolescence have long-term adverse effects in terms of elevating the risk of mental health issues and behavioral disorders during adulthood (Blakemore, 2019).

The worrying mental health issues among Chinese adolescents may be related to heavy academic stress. Traditional Chinese values tend to judge personal excellence heavily based on academic achievements as reflected by the Chinese saying, "All else is inferior, only scholarship is superior (万般皆下品, 惟有读书高)", which is likely to lead to overemphasis on academic excellence and neglect of soft skills training. Accordingly, Chinese children, from an early age, are engaged in a highly competitive system designed to prepare them for university admission due to the intense competition for limited educational opportunities (Li, 2017; Zhao, 2016). A survey including 8,847 teenagers from seven Chinese cities revealed that, more than 30% of adolescents spent over two hours each day on homework, and more than 45% were engaged in extracurricular tutorial classes during off-school hours to enhance their academic performance (Yuan et al., 2017).

Furthermore, the increasing pressure and academic competition have given rise to the phenomena of "Neijuan (内卷)" ("involution" in English) in contemporary Chinese societies (Yu et al., 2018). It is a manifestation of a belief that more effort and time invested in studies will lead to better outcomes, creating a situation of over-investment and diminishing returns. "Involution" has been utilized to depict the consequence arising from the prevailing state of excessive competition across diverse sectors of Chinese society (Cai, 2022), and to attribute personal or societal stagnation to societal pressures (Kang & Jin, 2020). This term vividly captures the entrapment of Chinese students in a high-pressure and overly competitive academic environment leading to internal depletion where individuals, unable to effect change, resort to "self-flagellation" (Li, 2021). Such excessive academic investment resulted in academic burden and anxiety experienced by adolescents (Jiang et al., 2021), which con-

sequently increased the risk of mental health disorders among Chinese adolescents. For instance, based on data collected from 3,724 adolescents in the China Family Panel Studies (CFPS), high academic stress was found to be strongly associated with an elevated likelihood of depressive symptoms (Zhou et al., 2021). Hence, in this environment where "success overwhelms growth" within the intensely competitive setting, the rapid and widespread dissemination and usage of "involution" is also perceived as an emotional release for exhausted students and an urgent call for efforts to alleviate stress.

Meanwhile, the neglect of soft skills training among Chinese adolescents may make them lack of sufficient life skills (e.g., social and emotional skills) and unable to cope with challenges and adversity using effective strategies (Li, 2003). Chinese cultural norms often emphasize interpersonal harmony and discourage individual emotional expression, making adolescents conceal or suppress their negative emotions instead of managing them in effective ways (Sang et al., 2014). Indeed, Shek, Lin and their colleagues' (2021a) research showed that life skills among Chinese high school students are grossly lacking. Previous studies have also established a significant association between the lack of soft skills, such as coping skills, social and emotional skills, and worse mental health conditions, such as higher depression and anxiety (Nesayan et al., 2017). In conjunction with the aforementioned academic and social pressure, insufficient holistic skills and coping strategies may make Chinese adolescents more susceptible to developing mental health issues.

Given the high prevalence and long-term influences of mental health issues, as well as the lack of sufficient life skills, it is imperative to provide effective mental health services and soft skills training for adolescents in China. However, the mental health needs of Chinese adolescents have not been well satisfied (Shek et al., 2022d). In China, only about 5% of adolescents who need mental health services utilize school-based and non-school-based mental health care (Wu et al., 2012). The issue was further exacerbated during the COVID-19 period (Wu & Pan, 2019). First, adolescents have been given comparatively less focus, as they are perceived to have a lower susceptibility of infection and less severe symptoms in comparison to adults (Dhochak et al., 2020). Nonetheless, it's crucial to acknowledge that the long-term adverse impacts of this pandemic on the mental health of adolescents could potentially be greater than those on adults (Meherali et al., 2021). Second, the pandemic has led to decreased access to mental health services for adolescents (Huang & Ougrin, 2021). A meta-analysis showed that schools often serve as the first point of mental health services for adolescents (Duong et al., 2021). With school closures and the shift to online learning, isolated learning environments intensified adolescents' needs for mental health services, while they also lost this crucial access point. Thus, a significant proportion of adolescents did not receive the necessary mental health services during COVID-19 (Ghafari et al., 2022). Providing mental health education during COVID-19 is necessary to support adolescents' well-being.

Concerning these rising concerns, there is a need for China to implement more systematic mental health programs, which are supported by recent policies. Specifically, the Ministry of Education (2021) of China issued the "Guidelines for Mental Health Education in Elementary and Secondary Schools" and the "Double-Reduction policy", serving as the policy support for the reduction of academic burden and enhance-

ment of mental health education as national strategies (Wang & Xie, 2023). As China has placed greater emphasis on strengthening mental health education, there has been an increase in societal awareness of mental health. Noteworthy, this has established a robust base for the development of mental health education programs in China.

Positive Youth Development (PYD) Approach and PYD Programs in China

PYD is a strength-based approach aimed at fostering the healthy growth of young people (Lerner et al., 2011). It helps adolescents identify and refine their skills, competencies, and interests, finally empowering them to realize their full potential. Various models and frameworks have been proposed to conceptualize PYD attributes, including Lerner's 5Cs/6Cs model, social-emotional learning model, Benson's developmental assets framework including 20 external and 20 internal assets, and 15 PYD constructs proposed by Catalano (see Shek et al., 2019a for a review). The PYD approach has been employed in the design of different youth programs, demonstrating its effectiveness in promoting positive developmental outcomes while reducing negative outcomes among youths (Lee et al., 2015; Zhu et al., 2021). In particular, a study by Shek, Zhao and their colleagues (2021b) demonstrated the beneficial impact of PYD attributes in mitigating the adverse impact of the COVID-19 pandemic as a traumatic event on adolescents' the mental health.

A large number of studies across the globe have revealed the positive impacts of PYD programs on adolescents, such as in the U.S. and the U.K. (Buenconsejo & Datu, 2022; Ciocanel et al., 2017; Curran & Wexler, 2017). However, the application of the PYD approach has been limited in China compared to Western countries (Zhu & Shek, 2021). Given the cultural differences and intense academic pressure faced by Chinese youth, there exists a pressing demand for increased research and PYD programs in China. Prior research (Shek et al., 2021b) has also underscored the significance of promoting PYD qualities in Chinese adolescents via effective PYD programs. One significant step in this direction is the development and implementation of a youth program entitled "Positive Adolescent Training through Holistic Social Programs" in Hong Kong ("P.A.T.H.S. Project" hereafter)

The "P.A.T.H.S. Project" is a primary prevention program targeting the general adolescent population in the junior high school years. It is a school-based, and multi-year PYD program initially developed and implemented among Hong Kong junior secondary school students since 2005 (Shek & Wu, 2016). Based on Catalano's 15 constructs, the "P.A.T.H.S. Project" provided a comprehensive and well-structured curriculum that covered cognitive, moral, social, emotional, and prosocial competence necessary for adolescent healthy development (Shek & Zhu, 2020). This meticulously designed and wide-ranging curriculum ensured an all-encompassing learning experience for student participants, laying a solid foundation for holistic youth development (Shek & Wu, 2016). The effectiveness of the "P.A.T.H.S. Project" in promoting adolescents' positive outcomes (e.g., emotional well-being and thriving) and reducing negative ones (e.g., delinquency, substance use, and hopelessness) has been supported using quantitative and qualitative evaluation methodologies (Shek & Sun, 2012). It can be argued that the "P.A.T.H.S. Project" promotes holistic development and serves as a potent protective factor for Chinese adolescents, par-

ticularly evidenced by multi-year (2006–2011) research comprising eight waves of data (Shek & Zhu, 2020).

Overview of the "Tin Ka Ping P.A.T.H.S. Project"

Building on the successful implementation of the "P.A.T.H.S. Project" in Hong Kong, the research team undertook several key initiatives to ensure the applicability of this adapted project in mainland China through the support of Tin Ka Ping Foundation, leading to "Tin Ka Ping P.A.T.H.S Project" ("TKP P.A.T.H.S Project). Firstly, policies such as national educational policies and school policies are the primary consideration for project implementation and dissemination (Shek et al., 2022b). To ensure the integration of the project into the local school curriculum, the "TKP P.A.T.H.S. Project" was included in the curricular arrangements of different subjects (e.g., Mental Health and Moral Education) in local schools in mainland China.

In terms of curriculum adaptation, the high quality of the original curriculum developed for the "P.A.T.H.S. Project" facilitated a smooth adaptation process. In particular, a group of local school teachers was consulted to ensure the practicality and relevance of content design and arrangements. Special consideration was given to the subcultural differences between Hong Kong and mainland China and the local educational environment. Curriculum adaptations and modifications included the use of Mandarin expressions, simplified Chinese characters, and conceptually similar teaching and learning materials such as cases, examples, and scenarios that align with socio-cultural features in mainland China and local contexts (Zhu & Shek, 2021).

The research team also fully recognized the significant importance of ongoing and systematic teacher training to ensure well-trained project implementers for the quality implementation and sustainability of the project. Given this, after the successful three-year (September 2011 to July 2014) pilot implementation in four secondary schools in mainland China (Shek et al., 2014), the research team spent one year (September 2014 to August 2015) training prospective implementers. After this one-year training as a preparation phase, the "TKP P.A.T.H.S. Project" entered a full-scale implementation period in the 2014–2015 school year, with more than 30 schools across the nation joining the project. Additionally, the research team expanded the scope of the project by developing a curriculum for senior grade high school students in the 2015–2016 academic year. This expansion, grounded in rich experience and beneficial outcomes achieved in previous years, enables the "TKP P.A.T.H.S. Project" to exert a profound impact on a larger number of students, thereby amplifying its value and improving its applicability. The insights into the adaptation, implementation, and dissemination of the project in mainland China also see the published special issue (Shek et al., 2022c) and a review (Shek & Dou, 2024).

Consistent with findings in Hong Kong, evaluation studies support the favorable impacts of the "TKP P.A.T.H.S. Project" on mainland Chinese adolescents (Shek et al., 2019b; Zhu & Shek, 2021). For example, a quasi-experiment study involving 1,044 grade 7–8 students revealed that after attending class sessions in the "TKP P.A.T.H.S. Project", students in experimental classes exhibited a significantly larger enhancement in various PYD quality measures and less increase in depressive symptoms and delinquency than control group students (Zhu & Shek, 2020b). In the study

conducted by Zhu and Shek (2021) involving 20,480 students who were part of the project, over 90% of the participants held favorable perceptions of the project curriculum, teaching performance, and the program benefits to them. Additionally, individual teacher interviews ($n=9$) suggest that teachers as project implementers agreed that the project was effective in fostering student growth in various areas, including personal (e.g., self-confidence), social (e.g., relationships with parents and teachers), and academic (e.g., engagement and motivation) aspects (Shek et al., 2022a). Furthermore, utilizing a qualitative evaluation strategy, an analysis of the diaries of 2,337 students participating in the project during the 2022–2023 academic year indicated that the vast majority (98.2%) of students felt that they had benefited from the project participation during the pandemic (Shek, 2024). Specifically, students perceived positive growth in various dimensions, including resilience, coping strategies for stress, academic adjustment skills, positive attitudes toward the future, interpersonal competence, and intentions of contribution (such as community awareness).

The Need for Project Evaluation during COVID-19

While previous findings have provided support for the effectiveness of the "TKP P.A.T.H.S. Project", it is also crucial to conduct further evaluation studies to validate the findings and further refine the project implementation. Replication research is essential for reassessing the validity, reliability, and generalizability of original findings by showing consistent results across times and contexts (Makel et al., 2012). Importantly, replication in program evaluation improves the credibility of evidence-based practice and contributes to the cumulative knowledge base, supporting rigorous science and directing youth prevention and intervention toward more effective practices (Ioannidis et al., 2019). Given that prior affirmative evaluation findings of the "TKP P.A.T.H.S. Project" were derived from data collected before COVID-19, there is a need to have replications during COVID-19, which will offer valuable insights for the effectiveness of the project during the pandemic when the social context changed significantly.

Noteworthy, COVID-19 has brought tremendous and continuous challenges to adolescent mental health conditions. For example, perceived uncertainty and stress due to safety concerns caused by a large number of infected cases are major risk factors for intensified mental disorders among adolescents (Foster et al., 2023; Lai et al., 2023). The incidence rate of insomnia, depression, anxiety, and posttraumatic stress disorder was 37.8%, 48.2%, 36.7%, and 10.4%, respectively, among Chinese adolescents during the pandemic (Chi et al., 2021; Shek et al., 2021b). Moreover, the strict quarantine and social distancing policies have led to school lockdowns and a shift to online teaching and learning, which has resulted in excessive screen time and additional academic burdens among students as a result of the lack of peer interaction and ineffective feedback from teachers (Shek et al., 2021b). In light of these challenges, understanding students' participation experiences in the "TKP P.A.T.H.S. Project" and their perceptions towards the project during COVID-19 would be informative and beneficial for understanding the perceived effectiveness of the project among adolescents across contexts as well as for future planning and implementation.

A validated evaluation tool is a prerequisite for valid replication research on project evaluation during COVID-19. A widely used and convenient evaluation strategy in human services is subjective outcome evaluation (SOE), which is grounded in a client satisfaction approach (Zhu & Shek, 2021). SOE usually assesses the perceived project effectiveness from participants' perspective in terms of their perceptions of multiple aspects related to project implementation, including content quality of the project, performance of implementers, and influences of participating in the project, providing a holistic understanding of participants' experience and feelings. As a useful and cost-effective quantitative research strategy, SOE has been widely applied in social science research, such as educational program evaluations, to efficiently gather participants' perceptions of different aspects of the program to understand their opinions, satisfaction, and personal experiences related to the project timely (King & Bond, 2003).

In the "TKP P.A.T.H.S. Project", a 36-item SOE scale was validated and utilized to assess the perceived project effectiveness before COVID-19 (Zhu & Shek, 2021). The 36 items in the scale cover three dimensions, including program quality such as curriculum design (10 items), implementer quality such as instructor's professional attitudes and instructional abilities (10 items), and the perceived benefits gained from program participation such as enhancement of social relationships (16 items). The scale's three-dimensional structure and its invariance were supported by the data collected before COVID-19. Nevertheless, whether the scale also possesses good psychometric properties during COVID-19 is unknown. Thus, there is also a need to validate the scale to provide a reliable and valid tool for project evaluation during COVID-19.

The Present Study

The objective of the current study was to investigate students' perceptions of the "TKP P.A.T.H.S. Project" implemented in mainland China during COVID-19 (i.e., 2020–2021 and 2021–2022 academic years) using the SOE scale, by first examining the psychometric properties (i.e., validity and reliability) of the SOE scale as a prerequisite for meaningful application of the scale. Despite prior support for the scale's validity and reliability (Zhu & Shek, 2021), given the specific context in which this study was conducted (during COVID-19), it is essential to further validate the scale as an effective measurement tool across contexts. This not only enhances the confidence in the findings obtained based on the SOE scale but also helps us understand the commonalities or specificities of Chinese adolescent developmental needs across times and contexts. Replication studies, as a process of continually accumulating knowledge and evidence, increase the generalizability and scientific credibility of original findings (Schmidt, 2009), and are widely emphasized in academia as a cornerstone of social science research, particularly disciplines such as developmental psychology and educational psychology (Plucker & Makel, 2021).

First, we examined the SOE scale's psychometric properties in terms of different validities (factor structure, discriminant, convergent, and concurrent validities) and reliability. According to the previous findings (Zhu & Shek, 2021), we expected

an invariant three-factor structure of the SOE scale (i.e., perceived quality of the program, perceived quality of implementer, and perceived benefits of the program; Hypothesis 1a). It was also hypothesized that the scale's convergent and discriminant validities would be supported (Hypotheses 1b and 1c). Further, the scale was hypothesized to show adequate concurrent validity in terms of significant associations between rating in the scale and external criterion measures, including to what extent the participants would be willing to recommend the project to peer students (Hypothesis 1d) and to take part in similar projects in the future (Hypothesis 1e), as well as their overall satisfaction with participation experience (Hypothesis 1f). In addition, we also hypothesized that the SOE scale as well as its subscales would possess adequate reliability (Hypothesis 1g).

Second, for the perceived project effectiveness in terms of students' subjective ratings on the SOE scale, in line with previous positive findings, we also expected that most of the participants (more than 80%) would hold positive evaluations (Hypothesis 2).

Third, this study also investigated whether students' evaluations of the project varied with grade levels (i.e., junior secondary vs. senior secondary). Based on previous research in Hong Kong (Shek & Law, 2014; Zhu & Shek, 2021), lower grade students in junior high school years showed more positive perceptions than did higher grade students. Thus, the present study hypothesized that junior high school participants would have more positive ratings than senior high school students in their SOE scores (Hypothesis 3).

Method

Participants and Procedures

This study was reviewed and approved by the Institutional Review Board at the corresponding author's university (Ethical approval reference number: HSEARS20210526004). Before the start of the academic year, detailed information about the "TKP P.A.T.H.S. Project" was provided to the parents. This project was integrated into the school curriculum, and after obtaining informed consent from the parents for their children to participate in the project, students engaged in the "TKP P.A.T.H.S. Project" class throughout the academic year. Parents were also informed that their children would be invited to participate in the project evaluation study, with detailed research purposes and procedures provided. All parents provided their consent for their children's participation in the project and evaluation studies.

Upon the completion of each academic year, when project schools completed one year of project implementation, seven to eight project schools were randomly selected and student participants in these schools were invited to complete the SOE scale. Data collection was conducted by trained project implementers (i.e., teachers). Additionally, each project school received an evaluation manual containing standardized instructions for data collection to ensure data quality. Specifically, the implementers invited students to respond to the SOE scale upon the completion of the last "TKP P.A.T.H.S. Project" class in a voluntary manner. Implement teachers also

explained the study purpose, emphasized the voluntary nature of participation, and ensured anonymity and confidentiality principles. Every student who was invited to participate agreed to complete the questionnaire.

The present study analyzed data collected in the 2020–2021 and 2021–2022 years during COVID-19. A total of 6,653 valid questionnaires (M_{age} = 14.64, SD=1.55, 50.9% females) were collected, among which 3,765 (M_{age} = 13.46, SD=0.72, 50.4% females) were completed by junior secondary students (Grades 7–9) and 2,786 (M_{age} = 16.24, SD=0.68, 51.7% females) were completed by senior secondary students (Grades 10–12).

Measures

The present study used the aforementioned 36-item SOE scale that showed good psychometric properties in previous evaluation studies (Zhu & Shek, 2021). Among the 36 items, 10 covered program quality (i.e., curriculum design), and another 10 assessed implementer quality (i.e., instructor's professional attitudes and teaching skills). These 20 items used a six-point rating from "strongly disagree" to "strongly agree". The remaining 16 items were related to perceived program benefits such as the enhancement of social relationships. A five-point rating from "strongly disagree" to "strongly agree" was used for these items.

Three additional items were included in the questionnaire as external criteria for assessing the SOE scale's concurrent validity. The first item "To what extent are you willing to recommend the program to other students" and the second item "To what extent are you willing to participate in similar programs in the future" used a four-point rating from "definitely will not" to "definitely will". The third item assessed participants' overall satisfaction with their participation experience using a six-point rating from "very dissatisfied" to "very satisfied".

The above three items can serve as external criteria verifying the concurrent validity of the SOE scale because of the following points. Firstly, the three aspects (project quality, instructor performance, and project benefits) in the SOE scale have been identified as key factors influencing participants' willingness to recommend the project, their willingness to engage in similar projects, and their overall sense of satisfaction (Alscher et al., 2022; Quita & Nugroho, 2019; Zhu & Shek, 2021). Thus, the three items can serve as an objective and reliable criterion measure. Secondly, the inclusion of these items recognizes that while program quality and instructor performance are important factors in participants' evaluations, overall satisfaction with the project may encompass broader aspects that are not captured by the specific items in the SOE scale. Thus, by examining the relationships between scores derived from the SOE scale and ratings on these three additional items, we can acquire a more holistic comprehension of the concurrent validity of the SOE scale and its ability to capture participants' subjective evaluations of the program.

Data Analysis

Confirmatory factor analyses and invariance tests based on structural equation modeling were performed to test psychometric properties (Hypotheses 1a-1g) of the SOE

scale using M*plus* version 8 (Muthén & Muthén, 2017). The full information maximum likelihood (FIML) method was used for handling missing responses by making use of all available data. Prior to the main analyses, we routinely scrutinized the sample kurtosis and skewness of responses across all items. If non-normal distributed responses (i.e., kurtosis and skewness absolute values above the threshold of seven and two, respectively) were identified, we would employ the maximum likelihood estimator with the bootstrapping procedure (2,000 iterations of resampling). This approach helps to mitigate bias in the analysis (Arifin et al., 2012; Nevitt & Hancock, 2001).

First, we tested the expected three-factor structure of the SOE scale (namely, perceived quality of program, perceived quality of implementer, and perceived program benefits) based on the entire sample (Model 1) and six subsamples, including junior grade (Model 2) and senior grade students (Model 3), male (Model 4) and female students (Model 5), and samples with odd (Model 6) and even case numbers (Model 7).

Second, multigroup comparisons in CFA were performed to examine invariance across grades (junior secondary vs. senior secondary), genders (male vs. female), and case numbers (odd vs. even). The testing sequence across these subgroups began with configural invariance, which serves as the baseline model. This was followed by weak invariance, necessitating identical factor loadings. The final stage was strong invariance testing, which imposed both equal factor loadings and item intercepts.

We adopted multiple indices to assess the model fit, including the "comparative fit index" (CFI), "Tucker-Lewis Index" (TLI), "standardized root-mean-square residual" (SRMR), and "root-mean-square error of approximation" (RMSEA). Whether the data fit the model well was evaluated based on the following criteria: CFI and TLI should be equal to or greater than 0.90, while SRMR and RMSEA should be equal to or less than 0.08 (Kline, 2023). To determine whether invariance hypotheses could be accepted or not, changes in CFI (ΔCFI) instead of chi-square difference tests were used because the latter may lead to bias when the sample size is large (Cheung & Rensvold, 2002). ΔCFI no larger than 0.01 implies that measurement invariance is maintained across subgroups.

Third, after invariance tests, we examined convergent, discriminant, and concurrent validities of the SOE scale based on the whole sample. The convergent validity was evaluated using the "average variance extracted" (AVE) criterion. According to Hair et al. (2018), an AVE value that is equal to or exceeds 0.50 is indicative of robust convergent validity. This implies that the respective latent factor can explain more than 50% of the variance observed in the items. The assessment of discriminant validity was carried out by comparing the AVEs of latent factors pair with their shared variance defined as the square of the correlation between the two factors. Discriminant validity is supported when the AVEs of the two latent factors exceed the shared variance (Arifin et al., 2012). Concurrent validity was examined using regression analyses, where the three external criteria item scores were predicted by the three factors derived from the SOE scale.

Fourth, the reliability of the SOE scale and its subscales was also checked using the entire sample. The "composite reliability" (CR) of each subscale was calculated, considering the factor loadings of items within the respective subscale. A value no less than 0.70 of CR indicates good reliability (Fornell & Larcker, 1981). Addition-

ally, we calculated Cronbach's alphas and the average correlations among items within each subscale (i.e., "interitem correlations" to provide further insights into the scale's reliability in terms of internal consistency.

Following the examination of the psychometric properties of the SOE scale, we proceeded to analyze profiles of participants' responses in the SOE scale using SPSS 26.0 (Chicago, IL, USA). Lastly, we conducted a one-way multivariate analysis of variance (MANOVA) to determine potential differences in perceptions of the program quality, the implementer quality, and program benefits among junior and senior high school students. We also examined gender differences in terms of the different dimensions of the subjective outcomes.

Results

Based on kurtosis and skewness values (kurtosis absolute values between 7.24 and 9.52 and skewness absolute values between 2.07 and 2.64), responses of a few items in the SOE scale followed non-normal distributions, violating the normality assumption. Thus, to minimize potential bias, we utilized maximum likelihood estimation with the bootstrapping technique, employing 2,000 resampling iterations, in the context of CFA (Arifin et al., 2012).

The three-factor modeling results demonstrated adequate fit for the data (CFI ≥ 0.94; TLI ≥ 0.93; SRMR ≤ 0.03, and RMSEA ≤ 0.06, see Table 1) among the whole sample and all subsamples, supporting the expected three-factor structure of the SOE scale.

Results of invariance tests of the three-factor structure are presented in Table 2. Across grade levels, configural invariance was established as indicated by a good model fit ($\chi^2_{(1182)}$ = 14,992.54, CFI = 0.94, TLI = 0.94, SRMR = 0.03, RMSEA = 0.06) in Model 8 where no equality constraints were applied. As the change in CFI (ΔCFI = − 0.001) in comparison between Model 9 with equality constraints on factor loadings and Model 8 was less than 0.01, weak factorial invariance was supported. When further applying equality constraints on item intercepts in Model 10, the change in CFI (ΔCFI = –0.001) in comparison to Model 9 was also negligible, supporting strong invariance across grade levels. Similar findings were observed for

Table 1 Summary of Goodness of Fit for CFA models

Model	Description	χ^2	df	CFI	TLI	SRMR	RMSEA (90% CI)
M1	Whole sample (*N* = 6,653)	13,361.12	591	0.95	0.95	0.03	0.057 (0.056, 0.058)
M2	Junior secondary sample (*N* = 3,765)	8,096.41	591	0.94	0.94	0.03	0.058 (0.057, 0.059)
M3	Senior secondary sample (*N* = 2,786)	6,896.13	591	0.95	0.94	0.03	0.062 (0.061, 0.063)
M4	Male (*N* = 3,189)	6,423.73	591	0.95	0.95	0.02	0.056 (0.054, 0.057)
M5	Female (*N* = 3,309)	8,209.52	591	0.94	0.93	0.03	0.062 (0.061, 0.064)
M6	Odd (*N* = 3,327)	6,923.53	591	0.95	0.95	0.03	0.057 (0.056, 0.058)
M7	Even (*N* = 3,326)	7,925.08	591	0.94	0.94	0.03	0.061 (0.060, 0.062)

Note. CFA = confirmatory factor analysis; df = degree of freedom; CFI = comparative fit index; TLI = Tucker Lewis index; SRMR = standardized root mean square residual; RMSEA = root mean square error of approximation; CI = confidence interval

Table 2 Summary of Goodness of Fit for Invariance tests

Model	Description	χ^2	df	CFI	TLI	SRMR	RMSEA [90% CI]	Model Comparison	$\Delta\chi^2$	Δdf	ΔCFI
Grade-level invariance											
M8	Configural invariance (baseline model)	14,992.54	1182	0.94	0.94	0.03	0.060 (0.059, 0.061)				
M9	Weak factorial invariance	15,163.43	1215	0.94	0.94	0.03	0.059 (0.058, 0.060)	M8 vs. M9	170.88***	33	−0.001
M10	Strong factorial invariance	15,393.46	1248	0.94	0.94	0.03	0.059 (0.058, 0.060)	M9 vs. M10	230.04***	33	−0.001
Gender-level invariance											
M11	Configural invariance (baseline model)	14,633.26	1182	0.94	0.94	0.03	0.059 (0.058, 0.060)				
M12	Weak factorial invariance	14,675.99	1215	0.94	0.94	0.03	0.058 (0.058, 0.059)	M11 vs. M12	42.73***	33	0.000
M13	Strong factorial invariance	14,767.15	1248	0.94	0.94	0.03	0.058 (0.057, 0.059)	M12 vs. M13	91.16***	33	0.000
Subgroups invariance (odd and even case numbers)											
M14	Configural invariance (baseline model)	14,848.61	1182	0.95	0.94	0.03	0.059 (0.058, 0.060)				
M15	Weak factorial invariance	14,894.73	1215	0.95	0.94	0.03	0.058 (0.057, 0.059)	M14 vs. M15	46.11***	33	0.000
M16	Strong factorial invariance	14,93.97	1248	0.95	0.94	0.03	0.057 (0.057, 0.058)	M15 vs. M16	36.24***	33	0.000

Note. df=degree of freedom; CFI=comparative fit index; TLI=Tucker Lewis index; SRMR=standardized root mean square residual; RMSEA=root mean square error of approximation; CI=confidence interval. ***$p<.001$

invariance tests between genders and case numbers (see Table 2). The findings provided support for Hypothesis 1a.

Convergent and discriminant validities, as well as the reliability of the SOE scale, were examined based on CFA results using the entire sample (see Table 3). The AVE estimates were 0.65, 0.74, and 0.70 for the three subscales, namely perceived quality of the program, perceived quality of implementer, and perceived program benefits, respectively, suggesting over 65% of the variance can be captured by their corresponding latent factor in the observable items. Furthermore, significant correlations were observed between perceived quality of program and perceived quality of implementer ($r=0.86$, $p<.001$), perceived quality of program and benefits ($r=0.66$, $p<.001$), and perceived quality of implementer and benefits ($r=0.60$, $p<.001$). These findings jointly supported the SOE scale's strong convergent validity, providing evidence to support hypothesis 1b.

For discriminant validity, we examined whether the AVEs of each two factors were larger than the squared correlation coefficient (r^2) between the factors. In this study, we discovered that the correlation coefficients (r) observed between every combination of factors were found to be 0.86, 0.66, and 0.60. Correspondingly, the shared variances (i.e., r^2) between every two factors were 0.74, 0.44, and 0.36. In the pair of program quality and implementer quality, the AVE (i.e., 0.65) of program quality was not larger than their shared variances (0.74), suggesting that perceived program quality may not be completely distinguished from implementer quality. For the remaining pairs of factors, the AVEs were greater than their respective shared variances. Overall, the findings imply acceptable discriminant validity of the SOE scale, except for program content and implementer quality. Therefore, we can conclude that hypothesis 1c was partially supported.

We used regression analyses to examine the extent to which the SOE factors predicted the three external criteria, as an indication of concurrent validity of the SOE scale. The findings are shown in Table 4. Results indicated that perceived program quality ($\beta=0.16$, $p<.001$) and perceived program benefits ($\beta=0.25$, $p<.001$) significantly predict participants' willingness to suggest other students attending the program, while implementer quality was not a significant predictor. Similar results were observed for the prediction effects of SOE factors on participants' overall sense of satisfaction. Regarding participants' willingness to participate in similar programs in the future, all three SOE factors were significant predictors ($\beta=0.16$, 0.06, and 0.21, respectively, $ps<0.001$). These findings partially supported Hypotheses 1d–1f, suggesting that during COVID-19 perceived program quality and program benefits were more likely to serve as significant predictors in predicting participants' likelihood of recommending the program and joining similar programs as well as their overall sense of satisfaction.

Composite reliability (CR) was calculated based on factor loadings derived from CFA based on the whole sample. The CR values for the three factors were 0.95, 0.97, and 0.97, respectively, suggesting good reliability of the scale (see Table 3). Furthermore, the scale's good internal consistency was suggested by the high Cronbach's alphas (above 0.95 for all subscales) and mean interitem correlations (ranging between 0.66 and 0.75). Thus, Hypothesis 1 g was supported.

Table 3 Validity and reliability of the subjective outcome evaluation scale

Subscales	Item	FL	95% CI of FL		Mean FL	AVE	CR	Cron-bach's a	Mean Interitem Correlation
			Lower	Upper					
Perceived Program Quality	1. The objectives of the curriculum are very clear.	0.81	0.79	0.82	0.81	0.65	0.95	0.95	0.66
	2. The design of the curriculum is very good.	0.85	0.84	0.87					
	3. The activities were carefully planned.	0.85	0.83	0.86					
	4. The classroom atmosphere was very pleasant.	0.79	0.77	0.80					
	5. There was much peer interaction amongst the students.	0.73	0.71	0.75					
	6. I participated actively during lessons (including discussions, sharing, games, etc.).	0.73	0.71	0.75					
	7. I was encouraged to do my best.	0.80	0.78	0.81					
	8. The learning experience I encountered enhanced my interest towards the lessons.	0.84	0.82	0.85					
	9. Overall speaking, I have a very positive evaluation of the program.	0.86	0.85	0.87					
	10. On the whole, I like this curriculum very much.	0.83	0.82	0.85					
Perceived Implementer Quality	1. The instructor(s) had a good mastery of the curriculum.	0.86	0.85	0.88	0.86	0.74	0.97	0.97	0.75
	2. The instructor(s) was well prepared for the lessons.	0.88	0.87	0.89					
	3. The instructor(s)' teaching skills were good.	0.90	0.88	0.91					
	4. The instructor(s) showed good professional attitudes.	0.90	0.89	0.91					
	5. The instructor(s) was very involved.	0.88	0.86	0.89					
	6. The instructor(s) encouraged students to participate in the activities.	0.86	0.84	0.87					
	7. The instructor(s) cared for the students.	0.85	0.83	0.86					
	8. The instructor(s) was ready to offer help to students when needed.	0.82	0.80	0.84					
	9. The instructor(s) had much interaction with the students.	0.82	0.80	0.84					
	10. Overall speaking, I have a very positive evaluation of the instructors.	0.84	0.82	0.86					
Perceived Program Benefits	1. It has strengthened my bonding with teachers, classmates and my family.	0.84	0.83	0.85	0.84	0.70	0.97	0.97	0.71
	2. It has strengthened my resilience in adverse conditions.	0.86	0.85	0.87					
	3. It has enhanced my social competence.	0.85	0.84	0.86					

Table 3 (continued)

Subscales	Item	FL	95% CI of FL		Mean FL	AVE	CR	Cron-bach's a	Mean Interitem Correlation
			Lower	Upper					
	4. It has improved my ability in handling and expressing my emotions.	0.85	0.84	0.86					
	5. It has enhanced my cognitive competence.	0.84	0.83	0.85					
	6. My ability to resist harmful influences has been improved.	0.83	0.82	0.85					
	7. It has strengthened my ability to distinguish between the good and the bad.	0.84	0.83	0.85					
	8. It has increased my competence in making sensible and wise choices.	0.84	0.83	0.85					
	9. It has helped me to have life reflections.	0.81	0.80	0.82					
	10. It has reinforced my self-confidence.	0.84	0.82	0.85					
	11. It has increased my self-awareness.	0.83	0.82	0.84					
	12. It has helped me to face the future with a positive attitude.	0.84	0.83	0.86					
	13. It has helped me to cultivate compassion and care about others.	0.83	0.82	0.84					
	14. It has encouraged me to care about the community.	0.83	0.82	0.84					
	15. It has promoted my sense of responsibility in serving the society.	0.83	0.82	0.84					
	16. It has enriched my overall development.	0.80	0.79	0.81					

Note. FL = factor loading; CI = confidence interval; AVE = average variance extracted; CR = composite reliability

Table 4 Predicting effects of subjective outcome evaluations on the three external criteria ratings

Predictors	B	SE	β	95% CI of β		R^2
				Lower	Upper	
DV: Willingness to suggest other students to participate in the program						0.14
Program quality	0.15	0.02	0.16***	0.11	0.20	
Implementer quality	−0.01	0.02	−0.01	−0.05	0.03	
Perceived benefits	0.23	0.01	0.25***	0.20	0.26	
DV: Willingness to participate in similar programs						0.15
Program quality	0.20	0.02	0.22***	0.16	0.25	
Implementer quality	−0.03	0.02	−0.03	−0.08	0.01	
Perceived benefits	0.22	0.01	0.23***	0.19	0.24	
DV: Overall satisfaction						0.16
Program quality	0.26	0.04	0.16***	0.18	0.33	
Implementer quality	0.10	0.04	0.06***	0.03	0.18	
Perceived benefits	0.32	0.02	0.21***	0.28	0.37	

Note. DV = Dependent variable, CI = Confidence interval. ***p < .001

Tables 5 and 6 summarize the participants' positive feedback regarding the three subscales in the SOE scale by grade level and also for the whole sample. Over 94% of the respondents gave positive responses toward program quality. For example, more than 96% of them rated the curriculum design as excellent and strongly liked it. Similarly, a large percentage of participants expressed positive views of the program implementers, with over 96% giving positive evaluations across various aspects, such as teaching abilities, attitudes, and engagement. Regarding the perceived benefits, the feedback was overwhelmingly positive, with more than 90% of responses showing that students had gained in various aspects from participating, such as improving resilience, self-confidence, and compassion. These positive evaluations provide support for Hypothesis 2.

As illustrated in Table 7, there were significant differences in subjective perceptions between junior and senior high school students (Wilk's $\lambda = 33.46$, $p < .001$, $\eta_p^2 = 0.031$), but in the opposite direction to our hypothesis. Adolescents in junior grades ($M = 5.26$, $SD = 0.82$) had lower levels of positive perceptions of program quality compared to those in senior grades ($M = 5.42$, $SD = 0.74$, $F = 31.11$, $p < .001$, $\eta_p^2 = 0.005$). In terms of the implementer quality, junior year participants ($M = 5.42$, $SD = 0.78$) also showed relatively lower levels of positive feedback compared to senior year participants ($M = 5.55$, $SD = 0.69$, $F = 37.75$, $p < .001$, $\eta_p^2 = 0.006$). Similarly, ratings on perceived benefits differed between junior and senior grade students, with the former ($M = 4.19$, $SD = 0.83$) possessing less favorable opinions than the latter ($M = 4.35$, $SD = 0.79$, $F = 20.45$, $p < .001$, $\eta_p^2 = 0.003$). These findings did not support Hypothesis 3. However, it is noteworthy that evaluations among the junior and senior school students were all positive and the differences between the two groups were not great. In addition, no gender differences were observed in student participants' subjective perceptions of the project.

Table 5 Positive responses (options 4–6) regarding participants' evaluations on the Program Quality and Implementer Quality

Items	Junior Secondary (*N*=3,765)		Senior Secondary (*N*=2,786)		Overall (*N*=6,653)	
	n	%	*n*	%	*n*	%
Perceived program quality						
1. The objectives of the curriculum are very clear.	3,758	96.49	2,771	97.26	6,630	96.79
2. The design of the curriculum is very good.	3,755	96.30	2,766	97.54	6,622	96.81
3. The activities were carefully planned.	3,745	96.34	2,755	97.24	6,601	96.74
4. The classroom atmosphere was very pleasant.	3,747	94.82	2,757	95.97	6,605	95.31
5. There was much peer interaction amongst the students.	3,742	95.08	2,742	96.54	6,585	95.66
6. I participated actively during lessons (including discussions, sharing, games, etc.).	3,746	93.70	2,762	94.86	6,609	94.14
7. I was encouraged to do my best.	3,750	93.52	2,762	94.93	6,612	94.13
8. The learning experience I encountered enhanced my interest towards the lessons.	3,745	94.29	2,756	96.04	6,601	95.06
9. Overall speaking, I have a very positive evaluation of the program.	3,753	95.42	2,758	96.37	6,613	95.78
10. On the whole, I like this curriculum very much.	3,751	95.68	2,768	97.36	6,620	96.37
Perceived quality of implementers						
1. The instructor(s) had a good mastery of the curriculum.	3,755	96.72	2,765	97.79	6,622	97.16
2. The instructor(s) was well prepared for the lessons.	3,754	97.23	2,765	98.19	6,621	97.63
3. The instructor(s)' teaching skills were good.	3,749	96.99	2,757	98.15	6,608	97.49
4. The instructor(s) showed good professional attitudes.	3,750	96.99	2,761	98.19	6,613	97.50
5. The instructor(s) was very involved.	3,746	97.17	2,761	98.08	6,608	97.56
6. The instructor(s) encouraged students to participate in the activities.	3,751	97.25	2,763	98.30	6,616	97.70
7. The instructor(s) cared for the students.	3,749	97.07	2,762	98.01	6,613	97.44
8. The instructor(s) was ready to offer help to students when needed.	3,754	96.56	2,757	97.46	6,613	96.92
9. The instructor(s) had much interaction with the students.	3,756	96.27	2,764	97.87	6,622	96.95
10. Overall speaking, I have a very positive evaluation of the instructors.	3,761	97.26	2,769	98.12	6,632	97.62

Note. All items were rated on a 6-point Likert-type scale with 1=strongly disagree, 2=disagree, 3=slightly disagree, 4=slightly agree, 5=agree,6=strongly agree. Only the positive responses (Options 4–6) are shown

Discussion

The COVID-19 pandemic has exacerbated the urgent need for PYD programs in mainland China. Insomnia, depression, anxiety, and posttraumatic stress disorder have become prevalent among Chinese adolescents during the pandemic period (Chi et al., 2021; Shek et al., 2021b). With studies suggesting the harmful influence of COVID-19 on adolescents' mental health, there is a need for replications to understand the perceived effectiveness of the PYD programs among adolescents during the pandemic. Thus, the present study serves as a prompt response to such a need by examining the perceived quality and benefits of a youth program entitled "TKP P.A.T.H.S. Project" among Chinese youth during the pandemic. This replication research also helps affirm the validity, reliability, and generalizability of favorable evaluation results of the "TKP P.A.T.H.S. Project" across times, contributing to the cumulative knowledge base (Flake et al., 2022; Freese & Peterson, 2017).

To assess the perceived effectiveness of the "TKP P.A.T.H.S. Project" during the pandemic, subjective outcome evaluation (SOE), a convenient and widely used strategy that assesses the perceived project effectiveness from client satisfaction perspectives, was implemented in the present research. The 36-item SOE scale assessed students' perceptions of the project in three aspects, including "program quality", "implementer quality", and "program benefits". As expected, the scale generally showed good psychometric properties. First, the expected three-factor conceptual structure of the scale fitted the data well and factorial invariance was identified across different subsamples (e.g., gender groups and grade levels). Second, the SOE scale and its subscales were internally consistent, as indicated by high composite reliability values and Cronbach's alpha coefficients. Third, the validity of the scale was also verified by satisfactory convergent and discriminant validity, despite a minor issue of the discriminant between program quality and implementer quality. Fourth, the concurrent validity of the SOE scale was largely supported by the significant associations between two (i.e., program quality and benefits) of the three SOE factors and additional measures of satisfaction. These findings align with previous research findings obtained before COVID-19 (Zhu & Shek, 2021), which jointly support the SOE scale's validity and reliability across contexts.

During the pandemic, students also had highly favorable assessments of program quality, implementer quality, and the benefits of the "TKP P.A.T.H.S. Project". The findings echo previous research results, indicating that the project has been well received by student participants before and during the pandemic (Zhu & Shek, 2021). The program was praised by students for its clarity of objectives, well-designed curriculum, careful planning of activities, pleasant classroom atmosphere, opportunities for peer interaction, and active student participation. These aspects arguably contribute to the creation of engaging and enjoyable learning experiences for the students, which tends to enhance their motivation and engagement in learning (Shek & Sun, 2012). A recent qualitative study during the pandemic reported similar findings (Shek et al., 2022a).

In addition to project content, the quality of the implementers is also an essential element in determining project success (Shek & Wu, 2016). In the "TKP P.A.T.H.S. Project", teachers who were willing to teach the project courses received sufficient

Table 6 Respondents with positive responses (options 3–5) regarding participants' perceived Program benefits

Items	Junior Secondary (*N*=3,765)		Senior Secondary (*N*=2,786)		Overall (*N*=6,653)	
	n	%	*n*	%	*n*	%
1. It has strengthened my bonding with teachers, classmates and my family.	3,747	92.13	2,771	93.22	6,620	92.55
2. It has strengthened my resilience in adverse conditions.	3,751	92.08	2,769	94.11	6,622	92.89
3. It has enhanced my social competence.	3,747	93.11	2,764	94.75	6,613	93.74
4. It has improved my ability in handling and expressing my emotions.	3,742	92.89	2,768	94.40	6,610	93.48
5. It has enhanced my cognitive competence.	3,740	92.75	2,761	94.46	6,602	93.44
6. My ability to resist harmful influences has been improved.	3,743	94.60	2,769	95.67	6,614	95.04
7. It has strengthened my ability to distinguish between the good and the bad.	3,740	94.76	2,762	96.09	6,604	95.31
8. It has increased my competence in making sensible and wise choices.	3,737	94.43	2,759	95.22	6,597	94.74
9. It has helped me to have life reflections.	3,738	92.59	2,762	94.17	6,601	93.21
10. It has reinforced my self-confidence.	3,743	92.68	2,766	94.29	6,610	93.36
11. It has increased my self- awareness.	3,738	94.38	2,766	95.77	6,606	94.93
12. It has helped me to face the future with a positive attitude.	3,735	94.43	2,762	95.44	6,598	94.83
13. It has helped me to cultivate compassion and care about others.	3,741	93.74	2,763	95.08	6,606	94.28
14. It has encouraged me to care about the community.	3,744	89.88	2,767	91.54	6,613	90.58
15. It has promoted my sense of responsibility in serving the society.	3,745	94.63	2,767	95.05	6,613	94.78
16. It has enriched my overall development.	3,749	95.81	2,772	96.32	6,623	95.97

Note. All items are rated on a 5-point Likert-type scale with 1=unhelpful, 2=not very helpful, 3=slightly helpful, 4=helpful, 5=very helpful. Only the positive responses (Options 3–5) are shown

training before they served as project implementers to ensure high teaching quality (Zhu & Shek, 2020a, 2021). The training covered PYD concepts, rationales of the project, teaching methods that engage students actively and encourage reflection, as well as teaching demonstrations and classroom observations. Although teacher training was moved online during COVID-19, implementer quality was reassured as indicated by students' positive responses, which indicated students' appreciation of the implementers' mastery of the curriculum, well-preparation, good teaching skills, professional attitudes, and their encouragement of student participation, care for the students, readiness to offer help, and active interaction with students. The well-designed program content and positive interaction between implementers and students may then create a supportive learning environment, and enhance program outcomes (Burroughs et al., 2019; Shek & Sun, 2012). As the teaching method in mainland China is commonly didactic and teacher-centered, the present study suggests that experiential pedagogies central to the "TKP P.A.T.H.S. Project" are good alternatives to be considered by teachers in mainland China.

Consistent with our hypothesis, students also perceived various benefits from participating in the "TKP P.A.T.H.S. Project" during the pandemic. These benefits covered a wide range of domains, including social, emotional, cognitive, and moral development as well as enhancement of interpersonal relationships. For example, the participation experience was considered by the students as having a positive impact on their communication and emotional skills in dealing with developmental challenges and social interactions. The positive perceptions of program benefits are also in line with previous findings (Shek et al., 2022a), indicating the program's effectiveness in promoting holistic development among youths. This encouraging finding is especially helpful in addressing adolescents' mental health issues during COVID-19, as the enhanced holistic development in terms of competencies and life skills are constructive building blocks for healthy functioning and for preventing internalizing and externalizing problems (Shek et al., 2021a; Zhu & Shek, 2020b, 2023). In addition, no significant gender differences were observed in student participants' subjective perceptions of the project, which is consistent with recent meta-analyses showing no gender differences in the effectiveness of youth prevention programs (Coelho et al., 2021; Durlak et al., 2022; Newman et al., 2020). It can be argued that PYD programs are likely to benefit adolescent boys and girls in the same way.

Interestingly, inconsistent with our expectation, significant differences between junior and senior grade students were observed. In contrast to our hypothesis and previous findings before COVID-19 (Zhu & Shek, 2021), the present study found that senior grade students held higher levels of favorable feedback on program quality, implementer quality, and program benefits compared to junior grade students. It has been suggested that PYD programs may be more effective among younger adolescents (Shek & Law, 2014; Zhu & Shek, 2021), as older students, particularly in Chinese contexts, may prioritize their academic achievements more and be less engaged in extracurricular activities like PYD programs (Jiang et al., 2021). However, it should be noted that the previous studies focused on the differences between the lower grade and higher grade students in junior high school years (Shek & Law, 2014). The present findings imply that the situation might be different between junior and senior high school years in mainland China during COVID-19. Senior grade

Table 7 Participants' subjective outcome evaluations by Grade Level

Factors	Junior		Senior		Comparison	
	M	SD	M	SD	F	η_p^2
					33.46***	0.031
1. Perceived program quality	5.26	0.82	5.42	0.74	31.11***	0.005
2. Perceived implementer quality	5.42	0.78	5.55	0.69	37.75***	0.006
3. Perceived program benefits	4.19	0.83	4.35	0.79	20.45***	0.003

Note. ***$p < .001$. Covariates: age and gender

students may experience a more difficult time (e.g., academic stress and conflicts with parents) and higher risks of suffering mental health issues during COVID-19, putting them in a stronger need for PYD programs than junior grade students. Thus, the interactive and student-centered teaching and learning experiences in the "TKP P.A.T.H.S. Project" may provide senior grade students with an especially helpful and nurturing environment and opportunity to express emotions, release stress, and learn coping skills in a difficult time, leading to increased favorable attitudes towards the program.

Differences in psychological maturity could also be a contributing factor. Higher levels of psychological maturity in senior grade students may equip them with advanced skills in various dimensions such as metacognition, self-awareness, and self-reflection (Wang et al., 2020), which may have enhanced their understanding and appreciation of the project, thereby strengthening their positive perception of the project. Additionally, senior grade students may also possess higher levels of social awareness and emotional maturity (Negi et al., 2022), potentially increasing their acceptance of the project and their recognition of the need to further enhance their own psychosocial competencies. These possibilities may have collectively reinforced senior grade students' favorable perceptions of the project content, teachers as project implementers, and the benefits of the project, leading to a more positive evaluation. Nevertheless, the above-mentioned interpretations need to be verified by future research. Besides, it should be noted that the effect sizes involved in the findings are not large and both junior and senior high school students perceived the project to be positive.

This current study has several practical implications. Firstly, the encouraging evaluation results of the "TKP P.A.T.H.S Project" across contexts suggest that PYD programs can be a promising way to address the neglect of soft skills training in Chinese secondary schools. In addition, such an approach also represents an effective way to put national strategies announced by the Ministry of Education in China (Wang & Xie, 2023) into practice, reducing the academic burden and strengthening mental health education by cultivating youth life skills and inner strengths. Adapting the project to local contexts based on the principles of PYD and a robust theoretical framework, and considering the local educational and cultural environment, such as involving experienced local teachers in curriculum development, while aligning with school and national educational policies, is crucial for the successful implementation of similar PYD programs in Chinese schools to benefit students.

Secondly, the perceived benefits and overall satisfaction of the "TKP P.A.T.H.S Project" during the pandemic indicate that PYD programs can be successfully imple-

mented even in challenging circumstances. Meanwhile, such programs can also serve as a reliable resource to enhance mental health services during difficult times (e.g., the pandemic periods) and among youths in greater need (e.g., senior high school students). The replication and accumulation of evidence underscore the high demand for and benefits of PYD programs aimed at cultivating and enhancing the multidimensional psychosocial competencies of adolescents for holistic positive development. PYD programs may not only prevent the escalation of mental health issues among adolescents but also support them in developing resilience and adaptability, which is crucial in ensuring the overall well-being of adolescents to withstand crises (Shek et al., 2023). During crises, such as a pandemic, PYD programs and initiatives like the "TKP P.A.T.H.S Project" can be integrated into school curricula and teaching activities to offer students a timely "buffer zone". For example, these programs can function as mental health preventions and interventions, providing immediate psychological counseling and support during difficult times like crises.

Thirdly, based on a three-factor conceptual framework using the client satisfaction approach (Zhu & Shek, 2021), the SOE has proven to be a robust and reliable assessment strategy, which can be easily used in education and social work fields. The adequate validity and reliability of the SOE scale before and during COVID-19 suggests its applications across contexts, providing a reliable assessment tool for social workers, educators, and researchers to understand youth program effectiveness. The inclusion of comprehensive elements in the scale including program quality, implementer quality, and program benefits provides valuable insights into the key factors of program implementation and perceived effectiveness, facilitating evidence-based interventions and practices. This is a methodological significance of this study.

While this study provides valuable insights into the effectiveness of the "TKP P.A.T.H.S. Project" during COVID-19, its limitations should also be noted. First, this study compared junior and senior grade students as two groups cross-sectionally. As adolescence encompasses different stages and rapid development (Christie & Viner, 2005), students may perceive and evaluate the project differently over time. Future research can conduct a long-term follow-up study on the same group of students to gain a deeper understanding of the changes in their perceptions and satisfaction with the project. Second, the reliance on self-reporting in the SOE scale with data solely collected from adolescents may introduce personal bias (Furnham & Henderson, 1982). Future studies can further address this limitation by using multiple evaluation strategies (e.g., focus groups or individual interviews) involving multiple stakeholders (e.g., parents and teachers). Third, the present data were collected during the pandemic, which represents a unique context as compared to the non-pandemic. Future studies may compare evaluation findings across more contexts (e.g., public school vs. international school; rural vs. urban regions) to portray a more comprehensive picture of the program's effectiveness.

Despite these limitations, the current findings contribute further substantial evidence for the effectiveness of PYD programs in Chinese contexts. The remarkable achievements of the "P.A.T.H.S. Project" in both Hong Kong and mainland China provide compelling evidence for the applicability of PYD principles and approaches across cultural contexts. Beyond Hong Kong and mainland China, the "P.A.T.H.S. Project" has been introduced and implemented in Macau, with preliminary findings

supporting its effectiveness (Luk et al., 2012). Furthermore, the project has garnered interest from regions outside China, such as Sri Lanka and Singapore (Shek et al., 2022e). Based on existing work and experience, five key factors that influence the adaptation, implementation, and promotion of the project can be summarized as the "5 Ps," namely "policy," "people," "program," "process," and "place" (see Shek et al., 2022c for more discussions). Thoughtful consideration and management of the 5Ps can significantly facilitate the adaptation and implementation of the "P.A.T.H.S. Project" in other communities and contexts. Undoubtedly, it is necessary to continue promoting and refining the evaluation methods of PYD programs in response to the evolving national strategies and societal needs. Future research will certainly benefit from focusing on understanding how these programs can be tailored to different age groups and contexts, and how they can be adapted to withstand crises like a pandemic.

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Data Availability The raw data that support the findings of this study are available from the corresponding author, Daniel TL Shek, upon reasonable request.

Declarations

Ethics approval and consent to participate This study was conducted with the approval of the ethics review from the Institutional Review Board (IRB) at The Hong Kong Polytechnic University (HSEARS20210526004).

Conflict of interest The authors claimed no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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