Active And Avoidant Coping Profiles In Children And Their Relationship With Anxiety And Depression During The COVID-19 Pandemic: A Longitudinal Study

Qiaochu Zhang (✉ qzhang433-c@my.cityu.edu.hk)

City University of Hong Kong

Samuel M.Y. Ho

City University of Hong Kong

Yanlin Zhou

City University of Hong Kong

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Abstract

Active and avoidant coping styles are important dispositional factors for the development of anxiety and depression symptoms. Children use both active and avoidant coping together in daily life. No studies have investigated the relationship between active-avoidant coping profiles and internalizing symptoms of children in the COVID-19 pandemic. The present study aimed to investigate children's active-avoidant coping profiles and assess the relationship of active-avoidant coping profiles to anxiety and depression symptoms in the COVID-19 pandemic. A two-wave longitudinal study was conducted among 322 Chinese children in mainland China during the COVID-19 pandemic. Participants completed the Children's Coping Strategies Checklist – Revised1 in Time 1 and the Revised Child Anxiety and Depression Scale in Time 1 and 6 months later (Time 2). Four active-avoidant coping profiles were revealed: Low Active copers, High Active copers, Balanced copers, and Avoidant copers. Low and High Active copers were related to lower levels of anxiety and depression symptoms than Balanced copers and Avoidant copers. Avoidant copers showed less decrease in depression symptoms than Balanced copers and High Active copers. It is important to improve children's active-avoidant coping profiles for relieving anxiety and depression symptoms during the COVID-19 pandemic.

Introduction

Dispositional coping styles refer to a trait-like tendency to respond to stressors using a certain type of strategies across situations [1, 2]. Children's dispositional coping styles affect their ability to manage stress [3]. Amidst the COVID-19 pandemic, children and adolescents have experienced increased stress [4, 5]; they may be threatened by increased risk of being infected by COVID-19 virus. It is important to understand how coping affects children's internalizing symptoms in the COVID-19 pandemic.

The distinction of active and avoidant coping style is important in literature on children's coping style [1]. Most studies focus on the relationship of an individual avoidant coping style to anxiety and depression [e.g., 6, 7]. People hardly rely on a single coping style; instead, they have coping profiles consisting of multiple coping styles [e.g., 8]. However, no research has investigated children's active and avoidant coping profiles. Therefore, it is unclear whether children with more difference between active and avoidant coping styles show more or less internalizing symptoms than children with equal level of active and avoidant coping styles. Without improved knowledge on children's active-avoidant coping profiles, psychologists lack evidence-based judgement about how to improve children's active-avoidant coping patterns in the context of the COVID-19 pandemic.

Coping profiles in young people

Latent profile analysis can reveal heterogeneous coping profiles in children; it examines and compares different models for researchers to find the best method to categorize heterogeneous children into homogeneous groups of coping profiles comprising multiple dispositional coping styles [9].

Using latent profile analysis, Herres [10] identified four distinct coping profiles for adolescents with mean age of 16 years: disengaged copers (16.1%), independent copers (39.5), support-seeking copers (31.6%) and active copers (12.8%). Disengaged copers had the lowest scores on the overall coping scales and used avoidant coping strategies more than other strategies. Independent copers used moderate level of coping strategies with relatively lower level of support-seeking strategies. Support-seeking copers reported relatively higher level of support-seeking strategy than other strategies. Active copers reported the highest amount of all coping strategies. Contrary to the findings that avoidant coping style was maladaptive, the study revealed that support-seeking copers and active copers showed higher level of separation anxiety, generalized anxiety and total anxiety than independent copers and disengaged copers. Using latent profile analysis, Perzow, Bray [9] also identified four coping profiles of adolescents (12 to 18 years) in both a community sample and a low-SES sample: inactive, cognitive, and engaged copers and active copers. Engaged copers (21% in the community sample and 16% in the low-SES sample) used more engagement strategies and fewer disengagement strategies, and they showed the lowest level of anxiety and depression. Active copers (10% in the community sample and 13% in the low-SES sample) who had above-average scores of all coping styles had the highest level of depression and anxiety symptoms.

Little research has investigated coping profiles in children. Although the existing studies illustrated the importance of adolescents' coping profiles as correlates of anxiety and depression symptoms, they cannot illustrate the relationship between active-avoidant coping profiles and internalizing symptoms in children. Also, longitudinal studies on coping profiles are scarce. Longitudinal design can testify how coping profiles affect changes in internalizing symptoms over time [11]. Therefore, the current study adopted a longitudinal design and focused on children's active-avoidant coping profiles. We first examined whether children's coping profiles

could be categorized based on the difference between active and avoidant coping styles. Then, we tested how active-avoidant coping profiles contributed to anxiety and depression symptoms over time.

Avoidance versus active dispositional coping styles

Maladaptive avoidance is often related to adverse emotional outcomes [12]. Child avoiders avoid stressors and use coping strategies including repression, disengaging behaviour and wishful thoughts to deal with threat [13]. Despite evidence suggesting that avoidant coping can be beneficial in the short term [14], the majority of coping literature demonstrated that it was a risk factor for anxiety and depression in the long term. Among a sample of young people from 16 to 24 years, structural equation modelling indicated that higher avoidant coping was associated with more suicidal ideations [15]. Another study recruited 164 adolescents to measure their coping with recurrent pain, anxiety/depression symptoms, and somatic complaints by questionnaires [16]. The study found that avoidant coping was related to higher anxiety and depression level. Research on coping styles in children with cancer measured coping styles from multiple informants; disengagement coping was associated with a higher level of anxiety and depression reported by multiple informants [17].

Active coping is a protective factor against internalizing symptoms. The active copers approach stressors by exerting control over the situation; they attempt to solve the problems, make decisions, understand the problem, and think positively in the stressful situations [13].

Overall, active coping is opposite to avoidant coping in terms of its effect on psychological well-being. For example, in a sample of 870 adolescents, avoidant coping was related to less well-being and greater stress, while active coping was related to higher well-being and less stress [18]. Similarly, a study recruited 168 Latino youth, and the results showed that active coping was related to less internalizing symptoms and post-traumatic stress, while avoidant coping was associated with more internalizing symptoms and post-traumatic stress [19]. Among adolescents of Mexican origin, a study found that active coping buffered the relationship between stress and internalizing symptoms [20].

Active and avoidant coping reflects whether children orient towards or away from threats [14]. However, people are not either avoiders or active copers exclusively. An experiment found that a group of adult participants had high scores on both avoidant and approach coping styles above medians, showing avoidant-approach coping conflict after receiving both avoidant and approach coping training [21]. Avoidant-approach coping conflict was related to higher post-traumatic stress symptoms. Aldridge and Roesch [22] examined coping typologies among a sample of adolescents from minority social-economic families with latent profile analysis. The study identified three groups, using the 60-items COPE scale [23]: low generic copers (44.4%), active copers (48.3%), and avoidant copers (7.3%). Low generic copers showed low level of all coping strategies. Active copers relied more on active coping strategies than avoidant coping strategies; while avoidant copers adopted more avoidant coping than active coping. Therefore, some people have a coping profile that is high or low on both active and avoidant coping, whereas others may be lower in either active or avoidant coping styles. Also, the individual difference in active-avoidant coping pattern is likely to be consistent over time [14, 24]. Thus, active-avoidant coping profile may be dispositional. However, no study has investigated children's dispositional active-avoidant coping profiles, which limits our understanding of how active-avoidant coping patterns are related to internalizing symptoms. For example, it is unknown whether coping patterns that are equally high on both active and avoidant coping are associated with more or less anxiety and depression than high avoidant coping pattern.

The current study

The current study investigated children's active-avoidant coping profiles and their relationship to anxiety and depression symptoms in the context of the COVID-19 pandemic. Children were involved in a two-wave longitudinal study over a period of six months in the the COVID-19 pandemic. During the first assessment, fewer than 20 newly diagnosed cases of COVID-19 virus infection were reported each day in the country, and the school strictly implemented preventive measures. Children conducted the second assessment after six months. During the second assessment, the risk of COVID-19 infection increased in early June as more cities in Guangdong were categorized into medium-to-high risk areas, and the number of newly diagnosed cases reported each day slightly increased.

Hypotheses

According to findings from previous studies on active-avoidant coping pattern, it was hypothesized that children would exhibit different profiles of active-avoidant coping. As found in adolescents, children's coping profiles would be categorized by the difference between active and avoidant coping styles. The study also examined how active-avoidant coping profiles affected change in children's anxiety

and depression symptoms over time. We hypothesized that coping profiles higher on avoidant coping style would be related to more increase in anxiety or depression level than coping profiles higher on active coping style.

Methods

Participants

Data came from a large longitudinal research project where 321 Chinese children were recruited from a primary school in Shenzhen, Guangdong Province, Mainland China. The primary school was located in a community of the middle-class. These children were aged from 9 to 11 years (Mean = 9.54; SD = .51), with 53.3% (n = 171) girls, 45.8% (n = 147) boys, and three didn't indicate their gender. The majority of children (91.6%) were born in mainland China (n=294); 8.4% (n=27) of children were born in Hong Kong. Among the 321 children who completed the first assessment, 304 ($n_{\text{boys}}=142$; $n_{\text{girls}}=159$) continued to conduct the second assessment. The attrition rate was about 5.6%. The attrition was the result of the participants being absent from the school for personal reasons (e.g., transferring to other schools) during the second assessment.

Measurement

Avoidant and active coping styles. Avoidant and active coping styles were measured by the Children's Coping Strategies Checklist – Revised1 (CCSC-R1) [25]. A Chinese version of the scale was developed by the standard translation and back translation procedures [26]. The confirmatory factor analysis showed a 21-item active coping scale, and a 5-item avoidant coping scale. Items were rated on a four-point Likert scale (1 = *never*, 4 = *most of the time*; “when you had a problem in the past month, you tried to ignore it”). An avoidant coping score and an active coping score were calculated by averaging scores for each item. The higher the scores, the stronger the disposition to use avoidant or active coping. The Chinese translation of the scale showed a good internal consistency in the study (avoidant coping: Cronbach's Alpha=.74; active coping: Cronbach's Alpha=.94).

Anxiety and depression symptoms. The Chinese version of the Revised Child Anxiety and Depression Scale [27] was downloaded from the website (<http://www.childfirst.ucla.edu/Resources.html>). The scale included 47 items. The Anxiety Disorders subscale has 37 items (e.g., “afraid of looking foolish in front of people”), and the Major Depressive Disorder subscale includes 10 items (MDD; “feels nothing is much fun anymore”). Items were rated on a Likert scale from 0 to 3 (0 = *never*, 1 = *sometimes*, 2 = *often*, 3 = *always*). An anxiety score and a depression score were calculated by summing up scores of the relevant items on the Anxiety Disorders subscale and Major Depression subscale, respectively. The scales had excellent reliability with the current sample (Anxiety Disorder scale: Cronbach's Alpha=.958; Major Depression Disorder scale: Cronbach's Alpha=.878).

Personal information. Demographic information was collected by a demographic form involving questions about students' age gender and birthplace.

Procedure

Ethics approval was obtained from the Human Subjects Ethics Sub-Committee of the City University of Hong Kong (2020-21-CIR2-B1). All procedure in the research was performed in accordance with relevant guidelines and regulations of the Human Subjects Ethics Sub-Committee. Informed consent forms and assent forms were distributed to students in the primary school. Students were informed about the purpose and the procedure of the study, and then they brought the informed consent to their parents. Parents and/or legal guardians who agreed their children to participate in the study signed and submitted the informed consent form to researchers.

Only students who signed the informed consent form and obtained the signed informed consent form from their parents and/or legal guardians participated in the study. From November 16 to November 30, 2020 (Time 1), participants completed a set of questionnaires which included RCADS and the translated CCSC-R1 in the classrooms. After about six months (Time 2) from the first assessment, participants completed the second assessment to assess their anxiety and depression symptoms using RCADS, from May 27 to June 9, 2021. For both the first and second assessments, students had about 45 minutes to complete all the questionnaires. A researcher and a teacher were present in all assessment sessions to answer questions from the participants.

Results

Construct validity and internal reliability

We first entered the items of active and avoidant coping scale into the two-factor model based on the original factor structure in the study by Ayers, Sandler [13]. Item 2, item 13, item 20, item 25, item 8, item 9, item 30, and item 35 had a factor loading below .45. Therefore, these items were deleted from the scale. For CFA, a non-significant Chi-Square Test of Model fit [28], Goodness of Fit (GFA) >.90 [29], Root Mean Square Residual (RMR)<0.08 Kline [30], Comparative Fit Index (CFI)>.90 [31], Tucker Lewis Index (TLI)>.90 [32], and Root Mean Square Error of Approximation (RMSEA) >.80 [30] indicate a good fit of the model.

After deleting items with low factor loadings, the fit indices were acceptable to good: RMR=.056, GFI=.86, RMSEA=.063, CFI=.89, TLI=.88. Chi-Square Test of Model Fit was significant, $\chi^2(299) = 680.30, p<.001$. However, this index tends to be significant in a large sample [33]. The final structure of the Chinese version of the active and avoidant coping scale included 26 items (refer to Supplementary information). The internal reliability for the active coping scale was .94, while that for the avoidant coping scale was .74.

Descriptive statistics

In T1, girls were not significantly different from boys in anxiety and depression level. Also, girls were not significantly different from boys in avoidant coping, $t(316)=.029, p=.977$, and active coping, $t(316)=-1.07, p=.285$ (Refer to Table one). The Pearson's correlation showed that age was not significantly associated with active coping, $r=.016, p=.779$, avoidant coping, $r=-.049, p=.390$, anxiety symptoms, $r=-.004, p=.948$, and depression symptoms, $r=-.029, p=.608$ in T1. T-tests showed that birth place was not a significant factor affecting active coping, $t(319)=-.514, p=.608$, avoidant coping, $t(319)=-.007, p=.994$, anxiety, $t(319)=.276, p=.783$, and depression, $t(319)=-.270, p=.787$.

Two-tailed Pearson's correlation examined the relationship of T1 active and avoidant coping to anxiety and depression in T1 and T2. Higher avoidant coping was significantly associated with higher anxiety and depression symptoms in T1 and T2. Higher active coping style was significantly related to lower depression symptoms in T1 and T2. The association of active coping style to anxiety symptoms in T1 and T2 was not significant. Refer to Table one for correlation coefficients.

Table 1
Mean (standard deviation) and correlations of psychological variables (n = 321)

	Boys		Girls		Correlations			
	Mean	(SD)	Mean	(SD)	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
T1					Active	Avoid	Anxiety	Depression
Active	54.29	15.06	52.72	13.56			-.076	-.186**
Avoidant	7.93	3.24	7.95	2.78			.388**	.449**
Anxiety	24.01	20.93	28.57	22.60				
Depression	4.95	5.70	5.26	5.54				
T2								
Anxiety	11.32	14.23	13.06	15.29	-.068	.388**	.636**	.544**
Depression	2.06	3.83	2.16	3.68	-.121*	.449**	.478**	.511**
<i>Note.</i> Active=active coping style. Avoidant=avoidant coping style. ** $p<.001$ * $p<.05$								

Active-avoidant Coping Profiles in T1

We conducted latent profile analysis to identify heterogeneous active and avoidant coping profiles in children in T1, using maximum likelihood estimation with robust standard error (MLR). We increased the number of groups for the model until the fit indices showed that the model was not significantly better than the model with one fewer group. The Bayesian Information Criterion (BIC) and the Akaike information criteria (AIC) were used to estimate the model fit, with smaller numbers indicating better model fit [30]. Also, the value of entropy assesses how well a model classifies individuals; a larger value indicates better model fit [30]. The significant p value of Vuong–Lo–Mendell–Rubin likelihood ratio test (VLMR), the adjusted Lo–Mendell–Rubin likelihood ratio test (Adj.LMR), as well as

the Bootstrapped Likelihood RatioTest (BLRT) suggested a model with a certain number of groups was significantly better than the model with one fewer group. We examined the model fit indices for models with one to five groups (refer to Table two). The four-group model has the smallest BIC and AIC, as well as the highest entropy. All *p* values of VLMR, Adj. LMR and BLRT were insignificant for the five-group model, which suggested that the model was not significantly better than the four-group model. Thus, the four-group model showed the best model fit.

Table 2
Fit statistics for latent profile analysis models representing one to five coping groups

Number of groups	BIC	AIC	VLMR (p-Value)	Adj. LMR (p-Value)	BLRT (p-Value)	Entropy
1	1299.41	1284.32	NA	NA	NA	NA
2	1252.59	1230.38	.006	.008	0.00	0.89
3	1254.12	1216.42	.05	.06	0.00	0.68
4	1207.27	1158.24	.07	.07	0.00	0.90
5	1218.92	1158.58	.37	.40	.36	0.75
<i>Note.</i> The bolded four-group model showed the best model fit.						

Avoidant coping was lower than active coping in group one and group three. The difference between active and avoidant coping was larger in group three than in group one. Therefore, group one was labeled as Low Active copers and group three was High Active copers. The difference between avoidant and active coping was the lowest among four groups for group two. Thus, group two was termed as Balanced copers group. Avoidant coping was higher than active coping in group four. Group four was interpreted as Avoidant copers accordingly. Low Active copers accounted for 35.8% of the sample; Balanced copers comprised 9.3%. Approximately half of the participants belonged to High Active copers (53.0%). Only a small minority were classified into Avoidant copers (2.0%). Refer to Figure one for means of active and avoidant coping patterns.

Differences in anxiety and depression symptoms based on coping profiles

Repeated multivariate analysis of variance (MANOVA) was performed to examine the difference in anxiety and depression symptoms across the four coping profiles over the period of six months (Refer to Table three). With anxiety symptoms as the outcome variable, repeated MANOVA revealed significant main effects of group and time; however, the interaction between group and time was insignificant. The Scheffe Post Hoc analyses showed that Low and High Active copers were not significantly different in terms of anxiety symptoms. Low Active copers had significantly lower anxiety symptoms than Balanced copers and Avoidant copers. High Active copers had significantly lower anxiety symptoms than Balanced copers and Avoidant copers. Balanced copers had significantly lower anxiety symptoms than Avoidant copers. Overall, anxiety symptoms significantly decreased over the 6 months.

Repeated MANOVA for depression symptoms revealed significant main effect of time and group. The interaction between time and group was also significant. Low Active copers had significantly higher depression symptoms than High Active copers. Low Active copers showed significantly lower depression symptoms than Balanced copers and Avoidant copers. Balanced copers had significantly lower depression symptoms than Avoidant copers, and had significantly higher depression symptoms than Low Active copers and High Active copers. High Active copers had the lowest depression symptoms, while Avoidant copers showed the highest depression symptoms. Overall, depression symptoms significantly decreased from T1 to T2. The decrease was significantly larger for Balanced and High Active copers, compared to Avoidant copers. The decrease was not significantly different for other comparisons between groups.

Table 3
Changes in anxiety and depression symptoms based on the four active-avoidant coping profiles

	1.Low Active-Dominant		2.Coping Balance		3.High Active-Dominant		4.Avoidant-Dominant		Difference Between profiles	Time effect	Profile * Time
	M (SD)		M (SD)		M (SD)		M (SD)				
	T1	T2	T1	T2	T1	T2	T1	T2	<i>F</i>	<i>F</i>	<i>F</i>
Anxiety	26.95 (21.86)	12.10 (12.25)	37.03 (25.78)	24.03 (20.82)	22.61 (17.85)	9.19 (12.09)	63.44 (21.62)	35.83 (23.18)	15.42** 3,1<2<4	79.47**	1.50
Depression	5.66 (5.93)	2.10 (3.24)	7.93 (6.06)	5.00 (5.24)	3.79 (4.05)	1.35 (3.14)	15.50 (9.35)	6.67 (7.15)	18.223** 3<1<2<4	64.52**	4.25*
** $p < .001$ * $p < .05$											

Discussion

The present study aimed to identify active-avoidant coping profiles in children and investigated their association with internalizing symptoms over time during the COVID-19 pandemic. With latent profile analysis, the current study revealed a four-group model of active-avoidant coping profiles: Low Active copers, High Active copers, Balanced copers, and Avoidant copers. We didn't find significant difference between avoidant and active coping profiles by gender, age or birthplace. Contrary to previous studies which suggested that females showed higher level of avoidant coping than males [34], girls were not more likely to be categorized into Avoidant copers than boys. Also, the study by Aldridge [22] has found that active copers are marginally older than other groups, which was not replicated in our sample of children.

Our results suggested that non-clinical primary school children adopted both active and avoidant coping styles simultaneously, although the difference between the level of avoidant and active coping style varied across individuals. The majority (88.8%) of primary school children showed higher level of active coping style than avoidant coping style. Among them, 53% of children showed High Active copers profile which had relatively large difference between active and avoidant coping style. A small group of children (11.3%) showed aberrant coping patterns distinct from the majority of the participants. Among them, 9.3% of participants had similarly high level of both avoidant and active coping style. In contrast, 2% had higher avoidant coping style than active coping style. High and Low Active copers as well as Avoidant copers profiles in children revealed by the present study were comparable to Active copers and Avoidant copers identified in studies on coping profiles in adolescence by Aldridge and Roesch [22]. In the findings from Perzow [9] and Herres [10], adolescent active copers showed a high level of all coping styles, and they scored the highest on anxiety and depression symptoms. Consistently, we found avoidant copers who had the highest level of both avoidant and active coping styles showed the highest anxiety and depression symptoms.

Our results showed that Low and High Active copers were related to lower anxiety and depression symptoms than Balanced and Avoidant copers. Children who relied more on active coping style than avoidant coping style had lower anxiety and depression symptoms. Consistent with previous studies, these findings further supported that active coping style was an adaptive coping style, and avoidant coping style was a maladaptive coping style [35, 36]. In studies by Perzow [9] and Herres [10], adolescent Active copers are those who showed high level of all coping styles, and they scored the highest on anxiety and depression symptoms. Consistently, our study found that Avoidant copers who had the highest level of both avoidant and active coping styles showed the highest anxiety and depression symptoms. High Active copers had larger difference between active and avoidant coping style than Low Active copers. High Active copers had lower depression symptoms than Low Active copers, but they did not differ in anxiety symptoms. Therefore, it was speculated that depression symptoms might be more subject to increase in the difference between active and avoidant coping style than anxiety symptoms.

Balanced copers had higher anxiety and depression symptoms than Low and High Active copers, while they had lower anxiety and depression symptoms than Avoidant copers. This provided the first evidence that for children, having similarly high active and avoidant coping style was more maladaptive than having significantly higher level of active coping style, but was more adaptive than having significantly higher level of avoidant coping style. According to the reinforcement sensitivity theory [37], behavioral inhibition

system (BIS) was related to high sensitivity to punishment and motivation to avoid threats, while behavioural approach system (BAS) was associated with high sensitivity to rewards and motivation to seek rewards [38]. It has been shown that avoidant coping is related to BIS, and active coping is related to BAS [39]. Child balanced copers may have equally activated BIS and BAS. Therefore, they are motivated by the two incompatible needs to attain potential rewards and to avoid threats. The activation of the two inconsistent drives may result in approach-avoidant conflict [40]. When children avoid addressing problems, they may start to feel anxious or depressive about losing the potential rewards; however, when they switch to active coping style, they feel motivated to avoid problems to reduce stress. Due to this constant conflict in the two motivations, Balanced copers might have higher anxiety and depression than children who rely more on active coping style.

Our study adopted longitudinal design to investigate how coping profiles prospectively affect changes in anxiety and depression symptoms during the COVID-19 pandemic. Existing longitudinal research on coping profiles are insufficient. Such research can provide valuable implications on whether coping profiles affect emotional adjustment to a stressful situation over time. Our study showed that overall, anxiety and depression level decreased from T1 to T2, despite higher risk of COVID-19 virus infection during T2. The reduction of anxiety and depression might reflect primary school children's improved ability to cope with stress during the COVID-19 pandemic. Our results showed that children's active-avoidant coping profiles could affect changes in children's depression level over a period of 6 months. Child avoidant copers reported slighter decrease in depression from T1 to T2 than High Active copers and Balanced copers during the COVID-19 pandemic. Thus, Avoidant copers might have poorer emotional adjustment to a stressful situation. This finding might help identify vulnerable children that have low resilience against internalizing symptoms during the COVID-19 pandemic.

Our findings suggest that to improve coping profiles for children exposed to the pandemic, focusing on the difference between active and avoidant coping styles is warranted, rather than solely on active or avoidant coping styles. An effective intervention helps children rely more on active coping style than on avoidant coping style, instead of reducing avoidant coping style alone. Cognitive-behavioral techniques can help prevent anxiety and depression symptoms [41]. In addition to exposure therapy which helps reduce avoidance, it may be important to apply problem-solving skills training to dispositional Avoidant and Balanced copers to increase the use of active coping over avoidant coping [42].

First, we only conducted self-report measures of coping styles, which may be subject to biases. Second, the age range of primary school children was from 9 to 11 years. The limited age range may cause failure to detect the effect of age on psychological variables. Also, it should be cautious about generalizing the findings to other age groups. The use of the latent profile analysis revealed a very small group of Avoidant copers which only included 2% of the participants. The unequal sample sizes for each group of active-avoidant coping profiles could affect the type one error level and influence the results. Also, the study focused on the distinction between active and avoidant coping styles. Future research could examine if children's coping patterns involving other coping styles were related to changes in depression and anxiety during the COVID-19 pandemic. In this study, we found that internalizing symptoms decreased over 6 months during the pandemic. Future studies may investigate whether improving children's active-avoidant coping profiles related to changes in internalizing symptoms in the COVID-19 pandemic.

In conclusion, the study revealed four heterogeneous dispositional active-avoidant coping profiles that were classified based on the difference between active and avoidant coping styles: Low Active copers, High Active copers, Balanced copers, and Avoidant copers. Our findings suggested that Low and High Active copers were related to less anxiety and depression symptoms than Balanced and Avoidant copers. Also, Avoidant copers were related to less reduction in depression symptoms during the COVID-19 pandemic than High Active copers and Balanced copers. The findings might provide critical implications about improving children's coping profiles to reduce internalizing symptoms in children during COVID-19.

Declarations

Data Availability Statement: The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Disclosure statement: The authors declare that they have no conflict of interest.

Ethics approval and consent to participate: Ethics approval was obtained from the Human Subjects Ethics Sub-Committee of the City University of Hong Kong (2020-21-CIR2-B1). Students' parents who agreed their children to participate had signed the informed consent sheets and students had signed the assent sheets to participate.

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Author contribution:

QZ: Design the study; collect data; data analysis; write and revise the manuscript

SH: Data analysis; revise the manuscript; Prepare Fig.1

YZ: Collect data; data analysis; revise the manuscript; prepare Table 1

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Figures

Figure 1

Means scores of active and avoidant coping styles in the four coping profiles

Next, Chi-Square analyses were conducted to assess if the four groups with distinct coping profiles differed in gender, age, and birth places. The four groups were not significantly different in terms of gender, $\chi^2(3)=6.839$, $p=n.s.$, age, $\chi^2(6)=10.537$, $p=n.s.$, and birth place, $\chi^2(3)=2.709$, $p=n.s.$

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