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The changes of suicidal ideation status among young people in Hong Kong during COVID-19: A longitudinal survey

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Highlights

- This longitudinal study examines changes of suicidal ideation status among adolescents during COVID-19 with pre-pandemic and follow-up surveys when schools were re-opened.
- Respondents with consistent suicidal ideation were found to have significantly higher depression, anxiety, stress, loneliness, and social anxiety; fixed mindset; lower meaning of life and self-control; and lower parental support and supervision than non-suicidal participants.
- Participants with suicidal ideation at the follow-up reported more negative perceptions about the pandemic than non-suicidal participants.
- Higher anxiety, trait anxiety, higher stress from self-expectations, and lower life satisfaction in the baseline survey predicted higher likelihood of having suicidal ideation at follow-up.
- Relatively easy and low-cost evidence-based initiatives are recommended to examine the change of impacts of the mental health consequences of COVID-19 on youth well-being and suicidal behaviours.

Abstract

Background: Pandemics affect the physical and mental well-being of all potentially at-risk young people globally. This longitudinal study examines changes of suicidal ideation status among adolescents during COVID-19.

Method: A follow-up after nine-months of a school-based survey among 1,491 secondary school students was conducted during COVID-19. Psychological well-being, psychological factors, family support, and COVID-19-related experiences were examined.

Results: The prevalence of suicidal ideation were 24% and 21% among the participants before and during COVID-19, respectively. In particular, 897 (65.0%) remained non-suicidal, 193 (14.0%) recovered from being suicidal, 148 (10.7%) newly reported being suicidal, and 143 (10.4%) remained suicidal. Respondents who remained suicidal were found to have significantly higher depression, anxiety, stress, loneliness, and social anxiety, fixed mindset, lower meaning of life and self-control; and lower parental support and supervision than the other three groups. Participants with suicidal ideation reported more negative perceptions about COVID-19 than non-suicidal participants. Multinomial logistic regression showed that anxiety, trait anxiety and life satisfactory in baseline were associated with suicidal ideation at follow-up.

Limitation: This study was limited by the small number of protective variables being included in the baseline survey to examine the potential reasons for the recovery of suicidal ideation at follow-up.

Conclusion: Poor psychological well-being, lower level of family support, and negative impacts of the pandemic were consistently associated with students' presence of suicidal ideation during the pandemic. Further intervention studies are needed to examine effects of mental health consequences of COVID-19 on youth mental health and to promote positive youth well-being.

*Keywords***:** mental health, suicidal ideation, secondary school students, COVID-19

Background

The 2019 coronavirus disease (COVID-19) pandemic has lasted for more than a year since its initial detection. It continues to cause extensive morbidity and mortality worldwide (World Health Organization, 2021) and a major global mental health crisis (Arango et al., 2020; Galea et al., 2020). A recent systematic review of studies on COVID-19-related psychological distress found that there are high rates of symptoms of anxiety (6.3% to 50.9%), depression (14.6% to 48.3%), post-traumatic stress disorder (7% to 53.8%), psychological distress (34.4% to 38%), and stress (8.1% to 81.9%) among the general population in China, Denmark, Iran, Italy, Nepal, Spain, the US, and Turkey (Xiong et al., 2020). A living systematic review reveals that data about the global change in mental health among young people is rare (DEPRESSD, 2021).

Suicidal behaviour is highly related to poor mental health and a robust risk factor for completed suicide (Niederkrotenthaler et al., 2020). The pandemic may increase the risk of suicidal behaviour among the vulnerable individuals through its effects on a number of well-established risk factors for suicide (i.e., history of presence of psychiatric symptoms, and poverty and poor living conditions) (Moutier, 2020). Suicide is the second most common cause of death in 15–24-year-olds worldwide (Dorney et al., 2019; Tandon & Nathani, 2018). The trend of suicidal behaviour among young people has remained relatively stable in most countries over the years (Guzmán et al., 2019) but was expected to increase due to the pandemic (Brown & Schuman, 2021; Rousseau & Miconi, 2020). Physical distancing, school closures, and reduced access to mental health services during the pandemic disrupted daily routines and increased the sense of loneliness, depression, anxiety and, therefore, triggered suicidal behaviour among young people (Singh et al., 2020; Wasserman et al., 2020). One the other hand, some may experience “lockdown relief”, especially for those who experienced anxiety pre-COVID (Moss, 2020). For some adolescents, lockdown may disassociate them from immediate stressful situation and receive more family support and healthier family life (Moss, 2020; Zhu, Zhuang, & Ip, 2021). According to UNESCO, schools were suspended in 188 countries in 2020 and over 90% of enrolled learners (1.5 billion young people) worldwide were impacted (Lee, 2020). The scale of the potential impact of the COVID-19 on the worldwide young population seems inconceivable. Examining the changes of suicidal ideation and their associated factors can help specify the different impacts of COVID-19 on suicidality.

Previous longitudinal studies reported the change of suicidal ideation status among young people is related to short term mental health issues, previous mental health status, socio-economic status, personality, and social support factors (Manning et al., 2021), chronic stress factors and quality of life (Alves et al., 2016), and personality factors, such as trait anxiety, attitude towards setbacks and negative affect. Persistent suicidal ideation (SI) may be linked to an increased risk of making suicide plans and suicide attempts (Dugas et al., 2015). Little has been reported about the change of SI status among young people during the COVID-19 and the number of identified protective factors, e.g., social support (Scardera et al., 2020), for suicidal ideation from longitudinal studies are much less than risk factors. In addition, a small number of studies suggest that suicides tend to increase after pandemics (Karakasi et al., 2020; Niederkrotenthaler et al., 2020; Sher, 2020), and it is known that this occurred in Hong Kong during the severe acute respiratory syndrome (SARS) period in 2003 (Chan et al., 2006; Yip et al., 2010) although the most recent evidence from 21 countries showed no increase in suicide rates during COVID-19 (Pirkis et al., 2021). The purpose of this study was to identify risk and protective factors that facilitate or discourage the development of SI among young people in Hong Kong so that suicide prevention and psychological well-being promotion measures can be proposed and made readily available when schools are reopened.

Method

Process and participants

On 25 January 2020, the Hong Kong Government raised the response level under the "Preparedness and Response Plan for Novel Infectious Disease of Public Health Significance" to "Emergency Level". Accordingly, several preventive public health measures, including surveillance, quarantine, social distancing, the use of face masks, and school closures, were implemented to suppress transmission of COVID-19 and the Education Bureau announced the deferral of class resumption. As the COVID-19 situation had improved slightly, schools were reopened on 27 May until July 2020. This school-based longitudinal study was conducted before (baseline in September 2019) and during the pandemic (follow-up in June 2020) when schools were briefly reopened before the third wave of COVID-19 hit Hong Kong.

Seventh and eighth graders from twelve schools who participated in the pre-COVID-19 survey were invited to participate in the second wave study when the schools reopened. Parental consent and students' assent were collected prior the survey. To reduce the concern associated with being

labelled, students were ensured that they were volunteer participants, and their teachers were not able to access their responses. The surveys were conducted in classrooms. To ensure the quality of the responses, two trained research assistants introduced the surveys to the students, answered queries, and provided guidance on how to complete the questionnaire when appropriate and without intruding on the participants. After the students finished the surveys, research assistants packed and sealed the questionnaires and took the packages back to the first author's university. Both English and Chinese versions of questionnaire were prepared for participants' selection. Ethical approval was granted by the Human Subjects Ethics Sub-Committee of the first author's university (No. HSEARS20161222006). All participants in this study received souvenirs (worth US$5) after finishing the follow-up questionnaire survey.

Measures

Measures related to responses to COVID-19 were added to the follow-up study to examine students' COVID-19-related experiences. All the measures used in both the baseline and follow-up were validated in Chinese and pilot tested. The survey took between 20 and 25 minutes to complete.

Measures only at baseline

Sociodemographic data included ethnicity, gender, age, and whether each participant lived with a parent. *Socio-economic status* (SES) was measured by whether the participants received any financial assistance from government or non-government organizations. Receiving no financial aid was coded as normal SES, while receiving financial assistance from a government or non-government organization was coded as low in SES and receiving financial assistance from both as lower in SES.

Life satisfaction was measured using the Satisfaction with Life Scale (SWLS, Diener et al., 1985; Sachs, 2003) to measure the global cognitive judgment of life satisfaction with one's life. The SWLS included five items were scored on a seven-point Likert scale, ranging from 1 *(strongly disagree*) to 7 *(strongly agree).* The mean of all five items was taken to measure life satisfaction, with a higher score meant higher levels of life satisfaction. An example item was *"In most ways my life is close to my ideal".* The *Cronbach's α* was .909 in baseline.

Trait anxiety was measured using the Trait anxiety subscale of the State-Trait Anxiety Inventory (T-STAI, Shek, 1993; Spielberger et al., 1983; Tsoi et al., 1986). T-STAI included twenty

items that assessed how people generally feel, ranging the frequency from 1 (*almost never*) to 4 (*almost always*), and the mean of all twenty items was taken to measure anxiety level, with a higher score meant higher scores meant more trait anxiety. An example item was "*I feel nervous and restless*". The *Cronbach's α* was .872 in baseline.

Measures at both baseline and follow-up

Suicidal ideation (SI) was assessed using the ninth item of the patient health questionnaire (PHQ-9, Kroenke et al., 2001), which was found to be a valid measure to screen suicide risk (Simon et al., 2013; Zhong et al., 2015). Respondents were asked *"Over the last two weeks, how often have you been bothered by thoughts that you would be better off dead, or of hurting yourself in some way?"* with answers ranging from *0* to *3* (0 = not at all, 1 = several days, 2 = more than half days, 3 = nearly every day). Answers of *1 to 3* were coded "yes" as having SI, while 0 was coded as no SI in past two weeks. To examine the change of suicidal ideation status at follow-up during the pandemic, four groups were categorized based on their answers about the presence of SI in both studies: (A) non-suicidal group (no SI in both waves); (B) recovered from SI group (presence of SI at baseline but not on follow-up); (C) occurrence of ideation group (no SI at baseline but presence on follow-up); (D) recurrence of ideation group (presence of SI in both studies).

Depressive symptoms were assessed using the first eight items of the patient health questionnaire (PHQ-8, Kroenke et al., 2009) with scores ranging from 0 to 24. Respondents were asked about the frequency of depressive symptoms in the past two weeks. An example item is "*Little interest or pleasure in doing things*" with answers ranging from 0 (not at all) to 3 (nearly every day). The higher score indicates a higher level of depression severity. The *Cronbach's α* was .846 in the baseline and .849 in the follow-up.

Anxiety symptoms were measured using the seven-item generalized anxiety disorder scale (GAD-7, Spitzer et al., 2006). Respondents were asked how often the anxiety symptoms bothered them in the past two weeks. An example item was "How often did you feel *nervous, anxious, or on edge in the past two weeks?"* with a four-point Likert scale *0* to *3* (*0 = not at all, 1 = several days, 2 = more than half days, 3 = nearly every day*). The sum of the scale (scores *0–21*) was the indicator of anxiety, with higher scores indicating more anxiety. The *Cronbach's α* was .915 in baseline and .928 in follow-up.

Social anxiety was measured using the ten-item social anxiety scale (SAS, La Greca et al., 1988) about how often one felt anxiety on social occasions and in interpersonal relationships. An example item was *"I worry about doing something new in front of other classmates*" and answers ranged from *0* to *2* (*0 = never true, 1 = sometimes true, 2 = always true*). The mean score indicates students' social anxiety level, higher scores greater social anxiety. *Cronbach's α* was .881 in baseline and .897 in follow-up.

Mindsets of depression, anxiety, and stress were measured using the twelve-item mindsets of depression, anxiety, and stress scale (MDASS, Zhu, Zhuang, & Lee, 2021) to assess students' fixed mindset on depression, anxiety, and stress in general. An example item was *"When you have a certain level of depression, you really cannot do much to change it"*, with a six-point Likert scale (*1 = strongly disagree, 6 = strongly agree*). The mean score indicates students' fixed mindset of depression, anxiety, and stress (i.e., the extent to which they believe the negative emotions are fixed and unchangeable). The higher the score, the more fixed the mindset. The *Cronbach's α* was .869 in baseline and .885 in follow-up.

Measures added at follow-up

Loneliness was measured using a single-item question: "*How often do you feel lonely*", with a frequency range from 0 = *not at all* to 3 = *nearly every day*. This is a commonly used single self-reporting format to measure loneliness (Pinquart & Sorensen, 2001; Zhu, Zhuang, Lee, et al., 2021). A higher score indicates higher perceived loneliness.

Stress was assessed using the adapted self-rated item *"How do you feel about your stress level over the past two weeks?"* (Elo et al., 2004), ranging from *0* (*no stress*) to *10* (*high stress*). A higher score indicates a higher level of perceived stress.

Family support was assessed using the four-item family subscale from the multidimensional scale of perceived social support scale (MSPSS, Zimet et al., 1988). An example item is "*I get the emotional help and support I need from my family*" with a six-point Likert scale ranging from *1* (*strongly disagree*) to *6* (*strongly agree*). The mean score indicates how much family support each participant perceived they have, and the higher score means the higher perceived family support. The *Cronbach's α* was .912.

Parental supervision was assessed using the three items from the parental monitoring measure (Stattin & Kerr, 2000). An example item is "*My parents know how I spend my free time"* with a 6-

point Likert scale ranging from *1* (*strongly disagree*) to *6* (*strongly agree*). The mean of the three items indicates how much parental supervision each student perceived they had received. The higher score means the more perceived parental supervision the student received. The *Cronbach's α* was.830.

Meaning of life was assessed using the purpose in life test-short form (Schulenberg et al., 2011). There were four items in the scale, such as "*In life I have the presence of clear life goals"*. A six-point Likert scale (range *1–6*) was applied, and the higher mean score indicated the student self-perceived more flourishing life purpose and meaning of life. The *Cronbach's α* was .772.

Self-control was measured using the self-control scale (SCS, Tangney et al., 2004), which was used to assess the individual differences in traits of self-control. The brief version in this study included nine items, such as "*I am good at resisting temptation",* the mean score (range *1–6*) was taken as a measure of students' self-control ability, with a higher value indicating a relatively higher level of self-control. The *Cronbach's α* was .781.

Vulnerability to coronavirus disease 2019 (COVID-19) was assessed using an adapted scale from the perceived risk of HIV scale (Napper et al., 2012). The wording HIV was changed to COVID-19. Two subscales with three items each assessed perceptions of personal risk and perceptions of the local community's risk. Example items were "*I feel vulnerable to COVID-19 infection*", and "*I feel that people in my local community are vulnerable to COVID-19*", with 5-point Likert scale (*1 = never, 5 = always*). The mean score indicated the perceived vulnerability to the disease, higher scores more fear of COVID-19. The *Cronbach's α* was .854.

Negative mental health impacts due to COVID-19 were assessed via five independent items: *"I am more stressed", "I have greater pressure from studies", "I felt horrified", "I felt apprehensive",* and *"I felt helpless"*, which were adapted from the items used to measure the negative mental health impact of SARS in a local study (Lau et al., 2006). Students replied 1 (*Yes)* or 0 (*No).* Perceived safety in COVID-19 was assessed via two single items: *"I feel safe living in my community"* and *"I feel safe at home"*, ranging from *1* (*strongly disagree*) to *5* (*strongly agree*).

Analysis

Descriptive analysis, Chi-square (χ^2), analysis of variance (ANOVA), and logistic regression were conducted using IBM SPSS 25.0. Means and standard deviations of the measured variables in both baseline and follow-up, and χ^2 tests were computed to compare the differences between

groups by gender, family structure, and SES. A one-way ANOVA was used to compare the statistical differences on all measured dependent variables by the independent grouping variable. Bonferroni correction was applied in the post hoc multiple comparisons among the four groups. A univariate analysis of variance was used to examine whether there was a significant interaction effect on the measured variables by SI group with gender, adjusted by the age covariate. A multinomial regression was then used to examine how the baseline variables predict the recovered, occurrence, and recurrence of having SI at follow-up in comparisons of the non-suicidal participants in both the baseline and follow-up.

Results

Table 1 outlines the demographic characteristics of the respondents. At baseline, 1,491 participants (52% Grade 7, 48% Grade 8) aged 10–17 years old (M_{age}=13.04, SD=0.86), 46.6% males participated. Only the participants who responded to the SI question in the follow-up study were included in the analyses (N=1,393). There was no significant difference between the missing (n=98) and those who participated in the follow-up (t_s>.05). Most participants (79.4%) lived with both parents, while 14.8% lived with one parent and 4% did not live with any parents. One in every five participants received financial assistance.

In general, 24.3% of participants reported having SI at baseline and 21.1% in the follow-up (paired T-test: T= 2.44, df=1380, p<.05). Table 2 presents the numbers and percentages of the four groups of participants with changes in the presence of SI status in follow-up. Around 65% reported no SI in both studies (non-SI group, n=897), 14% reported SI at baseline but not in follow-up (recovered from SI group, n=193), 10.7% reported no SI in baseline but in follow-up (occurrence of SI group, n=148), and 10.4% reported SI in both waves (recurrence of SI group, n=143). More female students had SI or occurrence of SI in follow-up than male students (χ^2 = 21.64, df =3, p <.001). There was no statistically significant difference of SI group distributions in family structure (χ^2 =10.99, df =6, p>.05) and SES (χ^2 =7.94, df=6, p>.05).

The ANOVA analyses with groups as the independent variable and measured variables in follow-up as the dependent variables were all statistically significant (see Table 3). In general, participants who reported being suicidal in the follow-up (Groups C and D) had higher scores in negative mental health measurements, more fixed mindset, with less parent support, and had more negative perceptions about the pandemic than those with no SI (Groups A and B).

Participants with persistent SI (Group D) had significantly higher depression (F=157.34, df=3, p<.001), anxiety (F=187.24, df=3, p<.001), social anxiety (F=29.19, df=3, p<.001) and stress (F=29.19, df=3, p<.001) than the participants in the other three groups. The post hoc analyses between each group were mostly statistically significant, with a gradual trend that the persistent SI group was in the worst status, the occurrence of SI group followed, then the recovery from SI group, and then the no SI group. However, the persistent and occurrence of SI groups were only statistically different in depression and anxiety levels, but not significantly different among other variables.

The ANOVA analysis found statistically significant group differences regarding the COVID-19-related variables. The participants with persistent and occurrence of SI reported more vulnerabilities and emotions than the non-SI and recovery from SI groups. However, students with SI in both waves reported significantly higher stress from studies than the non-suicidal group and the recovery from SI group. Suicidal participants in the follow-up felt significantly more pressure from studies during the COVID-19 pandemic. A higher proportion of non-suicidal participants reported feeling safer in the community and at home than the suicidal groups.

Univariate analysis of variance for gender differences revealed significant gender differences in four factors when the models were adjusted by age. Female students across all groups generally reported significantly higher loneliness (F=69.90, df=3, p<.001), social anxiety (F=23.34, df=3, p<.001) and fixed mindset (F=68.57, df=3, p<.001) than male students. Among students with SI, female students had significantly higher loneliness, social anxiety, and fixed mindset. In terms of family support, non-suicidal female students received more social support than males, while the suicidal female students in the follow-up received less social support (F=37.48, df=3, p<.001). Female students in the occurrence of SI group reported significantly lower family support than the male participants.

Further, the multinomial regression results indicate the direction of the predictive factors were similar for recover, occurrent or recurrent of SI in follow-up, but some were significant, and some were not. Wave 1 depression, anxiety symptoms, and trait anxiety were positively and significantly associated with recover of SI ($\beta_{\text{depression}}$ = 1.11, 95%CI: 1.04, 1.19; β_{anxiety} = 1.14, 95%CI: 1.07, 1.22; $\beta_{\text{trait anxiety}}$ = 3.17, 95%CI: 1.53, 6.58). High baseline trait anxiety and stress from self expectations also associated more occurrent SI ($\beta_{\text{trait anxiety}}$ = 2.79, 95%CI: 1.38, 5.67; $\beta_{\text{self-especations}}$ =1.10, 95%CI: 1.00, 1.21)). Having more depression and anxiety symptoms at baseline, being

female, and with low life satisfaction were more likely to have recurrent of SI ($\beta_{\text{depression}}$ = 1.17, 95%CI: 1.08, 1.26; β_{anxiety} = 1.16, 95%CI: 1.08, 1.25; β_{gender} = 2.17, 95%CI: 1.33, 3.57; $\beta_{\text{life satisfactory}}$ = 0.68, 95%CI: 0.56, 0.83).

Discussion

Although most young people are at low risk of being infected by COVID-19, the secondary consequences of the public health measures to control the spread of COVID-19 impact them extensively (Singh et al., 2020). The experience of the avian influenza in 1997, SARS in 2003, and the influenza A (H1N1) pandemic in 2009 has reinforced policy makers and the public in Hong Kong that there is a need for quick adaptation to many preventive public health measures to combat COVID-19 as a pandemic at the early stage of the outbreak. Hong Kong's first COVID-19 case was announced on 23 January 2020 (The Government of the Hong Kong Special Administrative Region, 2020) and measures taken were successful in reducing community transmission by 44%, measured by the average number of people each infected person infects (Cowling et al., 2020). According to one of the commentaries published in *Nature*, "Hong Kong seems to have given the world a lesson in how to effectively curb COVID-19" (Gibney, 2020).

However, many young people who had not experienced the SARS outbreak in 2003 may not have been as prepared as their older counterparts, so they could be more vulnerable during the current pandemic. In addition, the outbreak of COVID-19 in Hong Kong occurred amid the months-long socio-political unrest in which young people were the main participants. Ni et al. (2020) reported a prevalence of 11.2% and 12.8% of probable depression and post-traumatic stress disorder, respectively, in late 2019, and several studies reported worsening mental health status among the general public in Hong Kong during the pandemic (Tso & Park, 2020; Zhao et al., 2020). Young people and their families may have been severely impacted since 2019 and the scarring effects on them require attention. However, it is also found that more students reported increased social support from family and peers and improved lifestyle during the pandemic, and these positive changes serve as important "airbag" against the negative impacts of COVID-19 (Zhu, Zhuang, & Ip, 2021).

This longitudinal study examined the changes in SI status, and particularly investigated factors that may be linked to recurrence and recovery of SI among the young people in Hong Kong during the pandemic. It is a surprise to find that the prevalence of SI among the young people in the

follow-up survey was lower than baseline, although it is still above the percentages among young people in many countries. The most recent findings of the Global School-Based Health Survey conducted in 83 countries found that young people aged 12 to 15 had thought about (16.5%), planned for (16.5%), and attempted suicide (16.4%) in the past 12 months (Tang et al., 2020). From another perspective, it seems that the poor mental health status of young people in Hong Kong during the socio-political unrest reached its peak. In return, having a momentary break from the unrest may have given young people an opportunity to maintain more focus on their school and family life. Nonetheless, the high SI rate among the participants is still alarming.

From a wider perspective, at the beginning of the global outbreak of COVID-19, there was heightened global concern about the rise of completed suicide and suicidal behaviour during the pandemic (Sher, 2020). It is possible that, due to more awareness of individual well-being, social integration, local and global efforts in minimizing the spread of COVID-19, and an opportunity to decelerate life (Shanahan et al., 2020), the latest information from high-income countries indicates a decrease in the number of suicides and suicidal behaviour. For instance, Massachusetts (US), Victoria (Australia) and England reported no rise in suicide rates and Japan and Norway reported a fall in suicide rates in the early months of the pandemic (John et al., 2020). Our findings seem to be in line with the global trend of suicidal behaviours during the pandemic (Aknin et al., 2021; Pirkis et al., 2021). It is, however, noteworthy that the impact of the pandemic on suicide will vary over time and differ according to multiple intertwined factors between countries. It is of particularly concern that the pre-existing inequalities among the vulnerable will require more time to return to the pre-COVID-19 condition, if possible.

As hypothesized, the comparisons among the four groups with or without SI in the follow-up found that students with recurrent and occurrence of SI exhibited more poor mental health symptoms, poor psychological attributes, poor quality of life, had fewer parental supports, and perceived more negative influences due to COVID-19. Our findings also confirm that there are gender differences in suicidal behaviour (Miranda-Mendizabal et al., 2019) and female students appear to be more negatively impacted by the pandemic. We suspect that female students are more likely to desire closeness with others, dependence on peer relationships, and worry more about abandonment, loneliness and loss of relationships (Henrich et al., 2001; Rose & Rudolph, 2006) during school closure periods. They are, therefore, more likely to have adverse emotional experiences during the isolation period. Hence, students with chronic stress and psychopathology,

and especially females, should be considered for the identification of those in need of mental health services during the pandemic. It is interesting to note that among all of the examined variables, trait anxiety at baseline is the only statistically significant variable relates with the occurrent of SI at follow-up and also a significant variable relates to the recovery of SI. Future longitudinal studies that have more protective variables may help to understand more about the mediating and moderating roles of examined variables relate to recovery and occurrent of SI require further analysis. Many studies have indicated that pre-existing inequalities, e.g., SES, of psychological distress remain and exacerbate poorer mental well-being(Pierce et al., 2020). In this study, we found that being female relates positively with occurrent and persistent SI at follow-up and negatively relate to recover from SI. Given the fact that many of the participants did not know the family SES, we could not examine the impact of SES on SI in this study.

Implications

Due to the prospective cohort nature of this study, we were able to examine the factors that potentially relate to the changes of presence of suicidal ideation during the pandemic. We found that those with higher scores in fixed mindset, loneliness, being horrified, helpless, and feeling vulnerable to COVID-19 developed suicidal ideations during the pandemic. Higher trait anxiety and self-expectation stress at baseline predicted higher suicidal risk during the pandemic. Accordingly, it is suggested that female students at higher risk of being anxious and poor coping skills should be the prioritized group to receive support when schools are reopened in Hong Kong. Those who found meaning in life and had more self-control recovered from their suicidal ideations during the pandemic. In other words, young people who are less cognitively flexible and feel hopeless should be considered for the identification of those in need of mental health services during the pandemic, and mental health promotion programmes should aim to enhance individuals' cognitive flexibility and positivity. It is recommended that easy, low-cost evidence-based strategies, e.g., mindfulness, gratitude, self-compassion, that can be implemented to increase the frequency of positive emotions and well-being would be useful because they are typically brief, accessible, convenient, self-administered, and non-stigmatizing(Aknin et al., 2021). This recommendation is particularly useful in Hong Kong since many schools and students are 'catching up' with the time lost for finishing the planned curriculum and may not have the sufficient time for non-academic matters.

Conclusion

An important strength of this study is that it is one of the few longitudinal school-based studies in Hong Kong that allows for tracking of the changes in mental health and suicidality of a large and representative sample. The main limitation of the study is that some of the chosen positive variables (e.g., meaning of life and self-control) were not included in the baseline survey so direct comparisons of those variables cannot be conducted. In other words, the identification of possible protective factors to examine the recovered group is limited. Pandemics such as COVID-19 expose issues of avoidable health inequalities (Marmot, 2020). Specific vulnerable young people groups that are already experiencing inequalities (e.g., poor family support, in poverty) and young people who have poor physical and mental health before the outbreak, are likely to become more vulnerable (Holmes et al., 2020). The mental health consequences of a pandemic on youth are associated with individual, family, and community dynamics and require concerted societal effort to promote positive well-being. The potential costs of societal and health services introduced to assist vulnerable young people are likely to be substantial but will have a positive long-term return to society in general. Governments, policymakers, and leaders in the education, health, and social service systems thus need to anticipate and prepare for the advent of this emerging situation and intervene at an early stage to prevent the loss of skills and resources that young people can contribute to our future.

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Conflicts of Interest
None declared.
Multimedia Appendix
Nil

Reference

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Conflicts of Interest

None declared.

Multimedia Appendix

Nil