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Research Article

When Adversity Strikes: Maintaining Student and Teacher Wellbeing During the Covid-19 Pandemic

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Abstract

This one-year, three-wave longitudinal study adopted a positive prevention approach to test whether a school-based mental health intervention helped avert declines in student and teacher wellbeing at a P-12, co-educational school in Hong Kong, Special Administrative Region of the People's Republic of China (Hong Kong SAR, China). Teachers (n = 181) and students (n = 782) rated their individual levels of wellbeing at three time points (May 2021, September 2021, May 2022) and were also asked rate the levels of collective wellbeing they saw in others at the start and end of the intervention (May 2021 - May 2022). A comparison of the degree to which students felt their teachers were implementing wellbeing strategies in the classroom before and after the intervention was also made. Self-ratings of wellbeing at three time points remained stable for teacher and students, suggesting that the intervention played a protective role in wellbeing by preventing a decline. Additionally, the experience of high use of the wellbeing intervention strategies in class was associated with an increase in students' wellbeing across time during the pandemic. Students saw the collective wellbeing of their peers grow significantly from the start to the end of the intervention but reported no change in the level of collective wellbeing they saw in their teachers. According to the teachers, the collective wellbeing of their students and colleagues significantly increased over time. Levels of collective wellbeing were significantly correlated with individual wellbeing suggesting the whole-school approach to the intervention was valuable. Implications point to the importance of designing whole-school, context-based interventions that include all stakeholders and, thus, allows both individual-level and collective-level wellbeing to improve.

Keywords: Pandemic; student mental health; teacher wellbeing; positive psychology; collective wellbeing

When Adversity Strikes: Maintaining Student and Teacher Wellbeing During the Covid-19 Pandemic

The importance of good mental health has increasingly been recognised as a formal goal of education over the past two decades (Organisation for Economic Co-operation and Development [OECD] [1]; United Nations Educational, Scientific and Cultural Organization [UNESCO] [2]; World Health Organization [WHO] [3,4,]). This has led to an expansion in research and interventions designed to boost mental health outcomes for both students and teachers [5,6]. High rates of psychological distress caused by the Covid-19 pandemic have further increased the need for schools to find ways to better protect mental health [7]. The current study aims to test the effect of a positive education intervention on levels of individual and collective wellbeing in teachers and students across a one-year time frame during the pandemic.

How to Boost Mental Health: A Positive Psychology Approach

In 1946, the Constitution of the World Health Organization defined health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity". That wellbeing is a tangible state beyond the absence of illbeing is a core

tenant of the field of positive psychology, which has devoted the last two decades to designing and testing interventions for enhancing the positive end of the mental health continuum [8]. Indeed, in the paper that launched the field of positive psychology, Seligman and Csikszentmihalyi [9] argued that a focus on illness reduction and use of the disease model has "not moved psychology closer to the prevention of serious problems. Indeed, the major strides in prevention have come largely from a perspective focused on systematically building competency" (p.7).

While traditional prevention approaches in psychology seek to reduce disorder by removing negative risk factors (e.g., teaching people how to counter their maladaptive thinking to prevent depression), Seligman (2002) [10] called for a shift to "positive prevention" (p.3) and reasoned that teaching people how to enhance positive protective factors (e.g., personality strengths, supportive relationships, states of flow) could also be an effective way to prevent psychological illness. The idea of positive prevention was supported by Keyes [11], who showed that mental health sits along a continuum from illbeing through to wellbeing, and that the absence of illbeing does not automatically guarantee the presence of wellbeing. For example, an individual can be free of illbeing systems but still have low levels of wellbeing - a state labelled as 'languishing' [12]. Given that low wellbeing makes a person six times more at risk for developing major depression than high wellbeing [11], positive prevention efforts to boost wellbeing (as separate from reducing illbeing) are important.

Historically, schools have followed the traditional prevention approach and focused on reducing illbeing [6,13]. However, with the advent of positive psychology, and the growing understanding that high levels of wellbeing are an important protective factor, the positive prevention approach is growing in schools [6, 14].

The Impact of the Covid-19 Pandemic on Teacher and Student Mental Health

Of all the institutions negatively affected by the Covid-19 pandemic, education is arguably one of the worst-hit sectors, impacting more than 1.5 billion students worldwide (UNESCO, 2020) [15]. Over the past three years, schools have gone through repeated and ongoing uncertainty and disruptions, including multiple rounds of remote learning, rotational on-campus arrangements (half students at school one day and half the next), ever changing regulations regarding masks, hand washing, testing, physical distancing, density limits and so on which has impacted many aspects of school life including class sizes, classroom layouts, staggered lunch time sessions (to restrict the spread infection), frequent changes to pick-up/drop-off conditions, how and where assemblies are held, restricted opportunities for staff and faculty meetings and so on (Center for Disease Control and Prevention (U.S.), 2022; Centre for Health Protection, 2023) [16,17].

Not surprisingly, the mental health impact of these adversities on students and teachers has been a focus of psychology research [18]. Initially, the bulk of pandemic research was cross sectional which, although useful for providing schools with a real-time snap-shot, was criticized for not being able to show causation [19]. However, as the pandemic continues, more longitudinal studies (including panel and prospective) have been published, that allow comparisons of mental health statistics from before to during the pandemic and provide information about the ways in which mental health does, or does not, change over the course of this crisis.

A review of the longitudinal studies reveals they can be categorised based on which end of the mental health continuum they have focused upon: illbeing or wellbeing. With regard to student illbeing, evidence points to increases in distress on account of the pandemic. For example, a systematic review of 12 studies on primary and secondary aged students found significant rises in depression and anxiety from pre-pandemic to pandemic times in China, Italy, United States of America, Poland, and Turkey [20]. Elementary children in the UK had significant rises in symptoms of depression after the first lockdown compared to pre-lockdown levels (April–June 2020) [21]. In the United States of America, a two-year, four wave study of adolescents found significant increases in anxiety, depression and emotional dysregulation overtime [22]. A nationwide survey of German children and adolescents contrasting pre-pandemic to the pandemic data (December 2020-January 2021) reported an increase in mental illness from 18% to 29%, an increase in anxiety from 15% to 30%, and an increase in depressive symptoms from 10% to 15% (Ravens-Seibere et al., 2022). In France, elementary children were found to have increased attentional and hyperactivity problems compared to pre-pandemic levels, and this was especially so for students whose parents had lost their employment during the pandemic [23]. Distress does not always increase though and a study with Hong Kong SAR secondary students found that suicidal ideation did not change significantly from before to after the pandemic [24].

Turning to the other end of the mental health continuum we see a different pattern. While illbeing has commonly increased during the pandemic, wellbeing has decreased. For example, satisfaction with life significantly declined from before to during the pandemic for Australian adolescents [25] and dropped markedly for Lithuanian elementary school students [26]. Again, in Australia, 30% of teens reported reductions of hope from before to after the onset of the pandemic [15]. In this same sample, teens' assessment of their ability to cope dropped from 80% pre-pandemic down to 30% in April [15]. Prior to the COVID pandemic, 62% of Canadian teens reported positive mental health, however, in July 2020 this figure had dropped to less than half (42%) [27]. Teenagers from two studies in the USA showed significant declines in positive affect from before to during the pandemic [28,29]. Finally, positive mood and family satisfaction decreased significantly in elementary students in Germany from before to during the pandemic [30].

Unfortunately, there is considerably less pandemic-related mental health research for teachers than students. Yet what has been published also shows a clear trend of increases in illbeing. For example, in a two-wave study of Danish teachers (wave 1, May

2020; wave 2, November–December 2020), teachers reported a 27–84% higher prevalence of emotional reactivity and poorer mental health [31]. A study of Mexican teachers found higher levels of stress, burnout and emotional exhaustion in the second year of the pandemic (June-July 2021) as compared to before the pandemic [32]. For teachers in Belgium, burnout symptoms increased overtime as the pandemic continued [33]. In Germany, levels of burnout significantly increased in a sample of pre-service teachers from December 2019 to May 2020 (especially feelings of depersonalisation and lack of accomplishment) [34].

Despite a thorough review of research data bases such as Scopus, Google Scholar, PsycNet and Web of Science, we could find only two longitudinal studies on pandemic-related wellbeing changes for teachers (as opposed to changes in illbeing). In Austria, Lidner and colleagues (2021) tracked two wellbeing indicators – job satisfaction and positive affect – over time. From pre-pandemic through the first and second wave of lockdown, teachers reported declining levels of job satisfaction and positive affect. A study of teachers in Chile investigated whether the pandemic had an impact on aspects of wellbeing such as vitality, social functioning and quality of life. All three indicators diminished in the first year of the pandemic (July-October 2020) [35].

To summarise, the current findings from longitudinal research examining changes to mental health in pandemic times show evidence that both ends of the continuum have been negatively affected. More specifically, symptoms of illbeing have increased in students (higher depression, anxiety, mental illness, emotional dysregulation, attentional problems, and hyperactivity) and in teachers (higher stress, burnout, emotional exhaustion, emotional reactivity, and stress). On the other side of the continuum, wellbeing has decreased in students (lower life satisfaction, family satisfaction, hope, coping, positive affect and positive mood) as well as in teachers (lower job satisfaction, positive affect, vitality, social functioning and quality of life). Although less common, there are also findings to show that some mental health indicators have not changed such as the Zhu et al. [24] study on suicidal ideation.

Protecting Mental Health During the Pandemic: School-Based Interventions

The notable increases in illbeing and reductions in wellbeing during the pandemic point to a vital need for interventions in schools to support the mental health of students and teachers. As stated at the start of this paper, from a prevention perspective, interventions can opt to minimizing distress (i.e., teaching anxiety-reduction skills; providing strategies to deal with loneliness) or they can take a 'positive prevention' approach and aim to stop the reductions in wellbeing by protecting and maintaining levels of wellbeing during the pandemic (e.g., through mindfulness practices that create a state of calm; or teaching strategies to increase a sense of connection).

At present, there are very few published mental health interventions conducted with students during the pandemic. This could be a function of the barriers that researchers have faced in gaining access to students during repeated lockdowns and, indeed, the complexities the researchers have faced in their own lives [36]. We found five published interventions that had proven to have a significant impact on student mental health across Canada, Australia, United Arabs Emirates, Finland, and Japan. Of the five, two aimed to reduce illbeing (e.g., Malboeuf-Hurtubise [37] - mental health difficulties, anxiety, inattention symptoms; Kishida et al., 2023 – anxiety) [37]. Two had a dual-focus of mitigating increases in illbeing (e.g., anxiety) and reductions in wellbeing (e.g., life satisfaction, and positive affect) by promoting positive wellbeing resources (e.g., hope, efficacy, resilience and optimism) [38] and coaching students in acceptance-commitment therapy [39]. One focused on teaching positive psychology skills (e.g., positive reminiscing, mental contrasting, self-compassion) that sought to protect/buffer against declines in wellbeing and increase positive mental health [40]. This particular intervention led to increases in kindness and mental toughness for students from before to after the pandemic and had a protective effect on three key aspects of wellbeing - positive affect, emotional wellbeing and social wellbeing - where levels at the end of the intervention were the same as prior to the pandemic. Being able to maintain pre-pandemic levels of positive affect, emotional wellbeing and social wellbeing is, in itself, a very positive outcome given the adversity these students were facing. The fact that they did not experience the wellbeing decreases that have been commonly shown in young people during pandemic times, is an example of positive prevention (i.e., enhancing positive skills to prevent a reduction in wellbeing).

When it comes to teachers, a literature search revealed only three published mental health interventions for teachers during the pandemic. Two adopted a hybrid approach aiming to prevent increases in illbeing and minimize reductions in wellbeing. In Italy, Matiz, et al. [41] implemented an 8-week Mindfulness course with 66 female teachers (started face-to-face, then moved to online). At the end of the intervention, the female teachers reported lower anxiety, depression, and emotional exhaustion, together with higher psychological wellbeing, interoceptive awareness, and mindfulness levels. Zadok-Gurman et al. [42] delivered an enquiry-based stress reduction intervention with 35 Israeli teachers across 20 weeks (totalling 25 hours, in person and on-line) that served to increase psychological wellbeing and positive emotions. However, this intervention did not reduce levels of negative affect. In a sample of 36 pre-service teachers in Hong Kong SAR, Datu, et al. [43] conducted a one-month positive psychology intervention (four intervention workshops, totalling 10 hours, plus 2 weeks of videos and reflective exercises). At the end of the intervention, pre-service teachers scored higher on positivity, purpose and resilience. Overall, while the intervention research is still small, the results are showing positive effects on mental health for students and teachers through three pathways:

a) Preventing illbeing,

b) Maintaining wellbeing (i.e., blocking the expected decrease) and

c) Increasing levels of wellbeing.

Individual and Collective Wellbeing During a Crisis

The interventions outlined above focused on individual mental health outcomes for students and teachers. Yet, psychology research into disaster and crisis management shows that the collective resilience and wellbeing of the community within which a person belongs plays a crucial role in their mental health outcomes [44].

According to Mukherjee and Mandal [45], the "resilience of a community is not merely reflective of a number of resilient individuals put together" (p. 105). Similarly, collective wellbeing is more than the aggregate of each individual's state of mind, it is a separate, higher-order, group-level phenomenon [46,47]. Braithwaite [48] defines collective hope as "hope that is genuinely and critically shared by a group" (p. 7). When it comes to teachers more specifically, Liu, Song and Miao [49] suggest that "teacher wellbeing is an individual and collective phenomenon" which is both a "personal commodity and a shared societal experience" (p. 128). Liu, et al. [49] also call for more "priority on the emotional, mental and personal wellbeing of teachers" (p. 136). In a school context, Allison, Waters and Kern [50] describe collective flourishing as a situation where students and teachers are independently and interdependently feeling good and functioning well. There is a 'dynamic stability' to collective flourishing such it can be stable even when the individuals themselves regularly go up and down.

In all of these definitions, the internal individual psychological states of each group member (for example, students and teachers in a school) form the building blocks that are then transcended and transformed to create something bigger through psycho-social mechanisms such as emotional transfer, social contagion, vicarious experiences, and shared mental models [50-53]. What this means is that an individual can be part of a group that score highly on resilience, even if that individual is, themselves, low on resilience. In pandemic times, a student or teacher may feel that their own wellbeing is suffering but may observe that their fellow students and colleagues are functioning well.

The capacity of humans to see the collective wellbeing of the groups they belong to and separate this from their own levels of wellbeing serves a useful psychological function. This is because collective wellbeing is a source of strength for the individual [54]. Seeing the group as resilient, flourishing or hopeful, even when you are not, increases your own wellbeing. For example, in a study of flood survivors, the higher an individual rated their community on collective social capital, the less posttraumatic stress that individual experienced [55]. In workplaces, employees who rate their teams as having strong collective coping report lower levels of personal stress [56] and when an employee rates their team as having high levels of collective hope, efficacy, resilience and optimism this transfers downwards into that employee having higher levels of job satisfaction [53]. The importance of collective wellbeing during a collective crisis such as the pandemic cannot be understated and deserves more research attention.

Summary and Hypotheses

Existing research suggests that the pandemic has negatively impacted both ends of the mental health continuum by increasing illbeing and reducing wellbeing. The initial (and still most common) research design used to assess the mental health impact of Covid-19 has been cross sectional [57,58], yet it is only through longitudinal and intervention research that we can truly understand how to best protect mental health through this crisis. To date, there has been limited longitudinal and intervention research conducted on teachers' mental health, which leaves an important gap to address given the severe disruptions that teachers have had to work under [59] and their high levels of burnout [34,60].

While there has been comparatively more longitudinal research examining the effects of the pandemic on the mental health of students, when it comes to interventions, further evidence is still needed. Moreover, the research so far has focused on individual mental health outcomes and has not considered the role that collective wellbeing can play in protecting wellbeing during the pandemic. Finally, longitudinal and intervention pandemic research on the mental health of teachers and students in Hong Kong SAR[1] is virtually non-existent, with only one longitudinal study (in a student sample) and one intervention study (in a sample of pre-service teachers).

The current paper addresses these gaps by conducting a longitudinal, intervention study with teachers and students in Hong Kong SAR and by assessing individual and collective outcomes. Given that high wellbeing is a known protective factor for mental health [11], the current intervention adopts a 'positive prevention' approach [10] by training teachers in positive psychology strategies to use for their own wellbeing and to deliver in the classroom to support student wellbeing. This study has the following four hypotheses.

a) Hypothesis one: The intervention will have a prevention

1. Studies on the effects of the pandemic on mental health in Hong Kong SAR students are predominantly cross sectional. Only two published studies tracking the mental health of Hong Kong SAR students over time were found. Zhu et al., (2021) found no change in suicidal ideation from before to after the pandemic, they also measured social anxiety and depression but did not publish if these two aspects of illbeing changed. Wang, Ng and Siu (2022) measured wellbeing indicators (life satisfaction, hope, efficacy, resilience, optimism, family support and problem focused coping) before and after the pandemic. However, these authors did not report the mean scores of wellbeing from either time point and did not make comments in their study as to whether wellbeing declined, maintained stable or increased (the focus of their paper was interrelationships amongst wellbeing variables). The longitudinal papers that have been published with Hong Kong SAR students focused on the impact of the pandemic on pedagogy/on-line lesson delivery or achievement, not mental health (see Huang, Jong, King, Chai & Jiang, 2022; Lo, Cheung, Chan & Chau, 2021).

effect by stopping a decline in individual wellbeing for teachers and students over time.

b) Hypothesis two: Levels of wellbeing strategies used in the classroom will be significantly related to student wellbeing.

c) Hypothesis three: Collective wellbeing will be maintained at steady levels over the course of the wellbeing intervention.

d) Hypothesis Four: Individual and collective wellbeing will be significantly and positively related.

Method

The Positive Education Intervention: Visible Wellbeing

Over the past 15 years, education researchers have advocated for a science-informed pedagogy of learning [61] that involves training teachers how to use the science of learning to improve academic outcomes for students [62-64]. Along the same lines, Waters (2021, p. 144) has argued for a "science-informed pedagogy for wellbeing" that involves training teachers in positive education practices and strategies that they then deliver to their students. This form of positive education is called Visible Wellbeing (VWB) and it trains teachers in a language, framework and practices for seeing and building the wellbeing of their students.

The evidence-based framework that underpins the VWB intervention is called SEARCH [65,66]. The SEARCH framework covers six overarching pathways to wellbeing: strengths, emotional management, attention and awareness, relationships, coping and habits, and goals. Teachers who are trained in the VWB intervention undertake a three-hour training module in each of the six SEARCH pathways. The SEARCH framework was built in two key stages: (1) a large-scale bibliometric review of the field of positive psychology that analysed 18 years of research from 18,401 studies and used cluster analysis to identify the major domains/pathways to wellbeing [67]; and (2) an action research project involving ten schools that tested and refined the data-driven positive education framework [68].

To further establish the usefulness of SEARCH as a valid framework for developing student wellbeing, Waters and Loton [66] examined existing evidence from 85 published positive education interventions that mapped onto the six pathways. The interventions were undertaken in 14 different countries with a combined student population of 35,888 (ages 4–18 years). Results from this review paper showed a consistent pattern of evidence that each of the six pathways can be effectively targeted to improve wellbeing and academic outcomes. Positive education interventions using the SEARCH pathways were primarily found to increase optimism, hope, life satisfaction, motivation, self-confidence, positive affect, engagement, and social wellbeing.

Design and Timeline

A longitudinal intervention design was used to measure wellbeing at three-time points over a twelve-month time period. Planning for the study occurred in 2019, with the initial launch slated to be in August 2020. In the planning stage, there was no knowledge that the intervention would begin during a global pandemic. Once the pandemic hit, the launch of both the intervention and the possibility for data collection was postponed.

The intervention delivered four x 3-hour, remote workshops. The first workshop was a broad introduction and covered the VWB framework. Baseline measurement of SEARCH in staff and students was done after this workshop[2]. In response to the baseline data, the order of delivery for the three workshops from May 2021 to May 2022 were informed by the three SEARCH pathways that scored the lowest: coping, emotion management and relationships[3]. Figure 1 provides a breakdown of the workshops, the timing of data collection, the school context vis-à-vis the impact of the pandemic on the school, and the broader pandemic restrictions that students and teachers were living under in Hong Kong SAR, China (Figure 1).

Participants and Procedure

The Visible Wellbeing intervention was conducted at a K-12, co-educational school in the Hong Kong Special Administrative Region of the People's Republic of China. In May 2021, 181 teachers and staff took part in the data collection. From this collection, 7 did not complete all questions in the survey and were excluded from the analysis. From the completed surveys, 69 worked in primary and 84 in secondary. With regards to the primary teachers, 23.2% of primary teachers had less than 4 years of service, 26.1% had between 4 years and 9 years, 14.5% had between 10 and 20 years and 8.7% had more than 21 years of service at the school. 27.5% did not respond to the question. For the secondary teacher sample, 34.5% had less than 4 years of service, 28.6% had between 4 years and 9 years, 23.8% had between 10 and 20 years and 7.1% had more than 21 years of service at the school(6% did not respond to the question).

The student sample (n = 782) consisted of years 5 and 6 in primary and, for secondary students it was Y7-9 and Y11-12 who took part in the data collection. Year 10 data were collected but not used for this study as the staff who work with these students were not involved with the intervention and those students were also in a state of flux due to some being on a different campus. In the primary school there were 185 students, and 597 in secondary. Three-hundred ninety-one identified as female, 370 identified as male and 21 did not identify as male or female. At time two, 223 teachers and 711 students (193 primary and 518 secondary) took part. The third data collection occurred in May 2022 with 173 teachers and 737 students (65 in primary and 572 secondary). As responses were anonymous for ethical and privacy considerations, data matching across waves was not possible and precludes the use of repeated-measures statistics.

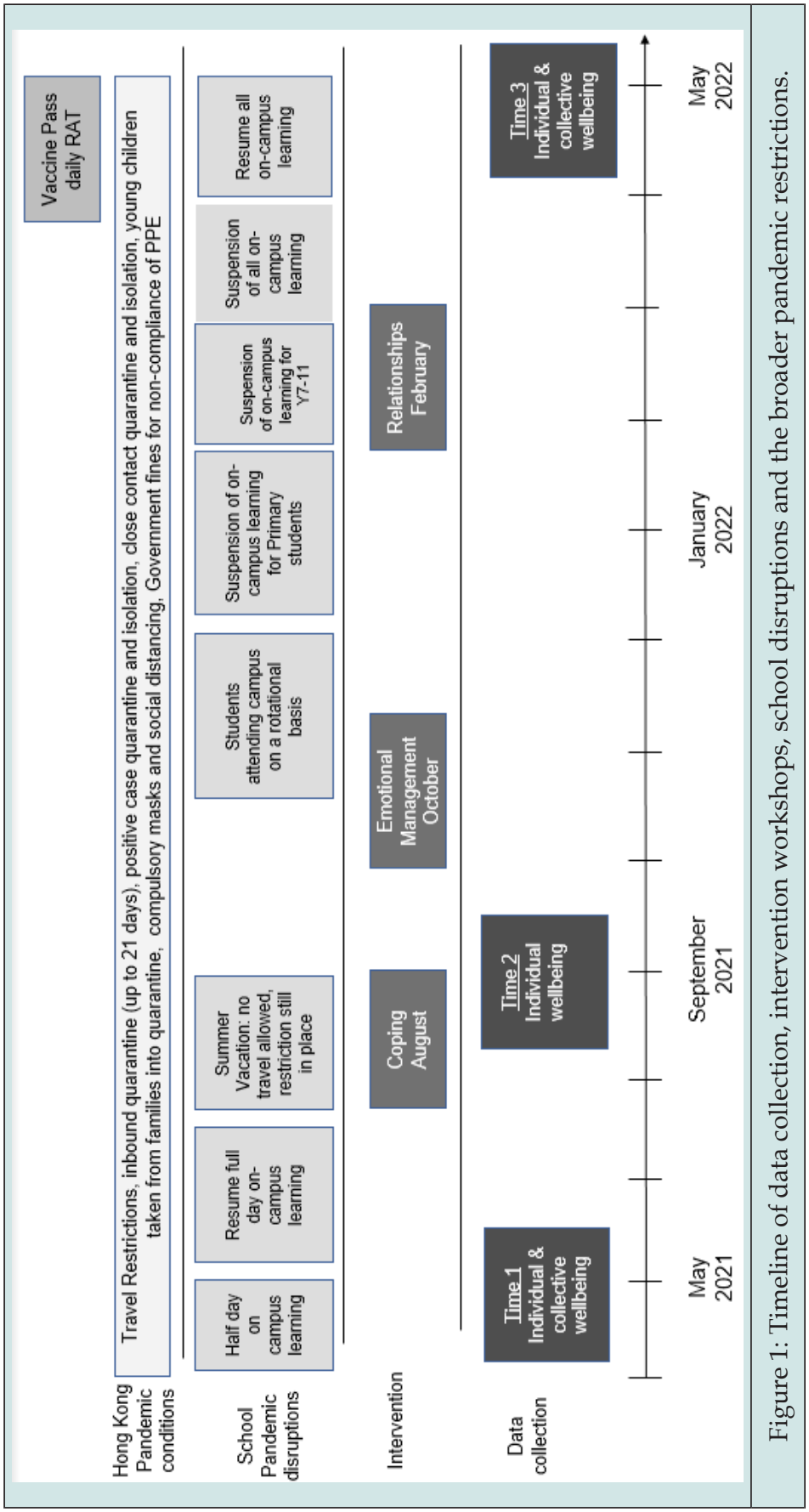

Figure 1: Timeline of data collection, intervention workshops, school disruptions and the broader pandemic restrictions.

Measures

Individual Wellbeing

A brief self-report, author-created measure of wellbeing was administered to staff and students. The survey was based on the SEARCH wellbeing model [66,69] and contained six items, one for each of the six pathways of SEARCH (e.g., Strengths was assessed through the item: "I clearly see the strengths in me, my personality, abilities, talents, and skills"). The six items were rated on a 5-point Likert scale from 1 (Never) to 5 (Always). Staff and students were asked to think about their own individual wellbeing and rate where they felt they were on each of the six SEARCH pathways. Responses across the six items were aggregated to create a wellbeing score. Individual wellbeing scores were collected at all three time points (May 2021, September 2021, May 2022).

Reliability tests across the two samples and three-time points found a pattern of mostly strong to very strong alpha coefficients, showing good internal consistency of the six items. Cronbach's alpha for this measure of wellbeing at time 1 was $\alpha = 0.75$ for teachers and $\alpha = 0.71$ for the student sample. At time 2, it was $\alpha = 0.62$ for teachers and $\alpha = 0.69$ for students. Testing at time 3 found coefficients of .69 and .73 for teachers and students, respectively. The average coefficient across all 6 data points was $\alpha = 0.70$ which puts the scale in the reliable category [70].

Collective Wellbeing

The same six items were used to measure perceptions of the collective wellbeing of others at school. Staff were asked to rate the levels of wellbeing they observed in their students and their colleagues. Students were asked to rate the wellbeing levels of their peers and their teachers. The ratings were at the collective level, meaning that participants were asked to think about what they were observing in the staff and students 'as a whole.' To avoid survey fatigue, collective wellbeing was measured only at two time points, May 2021 and then again in May 2022.

Assessing the collective wellbeing of others requires a 'referent shift' [71]. More specifically, study participants were asked to move the frame of reference away from their own wellbeing to think about the wellbeing of their peers, colleagues, students and teachers 'as a whole.' This type of referent shift has been successfully used in surveys by Cameron, et al., [72] who asked employees to rate the collective virtues present across the workplace. For example, assessing the degree of compassion in an organisation's culture, Cameron et al., [72] had employees think about the degree to which people, in general, at their work provide support for one another, including kindness and compassion when others are struggling. Waters (2020b) used the referent shift method with individual family members who rated the level of happiness for their family 'as a whole'. Williams, Kern and Waters [73] used a referent shift with teachers who rated the presence of organizational virtue prevalent across their school and then rated their own direct levels of happiness at work. Participants in the Delphi study by Allison, et al., [74], concluded that wellbeing can be observed at a collective level in schools.

As with the self-report scale of individual wellbeing, this 'other-report' measure showed good reliability. Cronbach's alpha for this measure of the collective wellbeing of students at time 1 was $\alpha = 0.75$ for teachers and $\alpha = 0.78$ for the student sample. Testing at time 3 found coefficients of .85 and .79 for teachers and students, respectively. The average coefficient across all 4 data points was $\alpha = 0.79$. Cronbach's alpha for the measure of the collective wellbeing of teachers at time 1 was $\alpha = 0.86$ for teachers and $\alpha = 0.84$ for the student sample. Testing at time 3 found coefficients of .75 and .86 for teachers and students, respectively. The average coefficient was $\alpha = 0.83$, putting it in the category of highly reliable [70].

Visible Wellbeing Use

Students were asked to rate the degree to which VWB strategies and practices were being used in their classes on a five-item survey. (e.g., My teachers do exercises and activities in class that help me to understand my own wellbeing). The five items were rated on a 5-point Likert scale from 1 (Never) to 5 (Always). To avoid survey fatigue, visible wellbeing use (VWB Use) was measured only at two time points, May 2021 and then again in May 2022. Cronbach's alpha for VWB Use at time 1 was $\alpha = 0.88$ and at time 3 was $\alpha = 0.88$, putting it in the category of highly reliable [70].

Context: Covid-19 Disruptions in Hong Kong SAR During the One-Year Study

Over the 12 months during the intervention and data collection, the school experienced significant adversity and uncertainty (Figure 1). When the first collection began in May 2021, schools in Hong Kong SAR were allowed to run half-days on campus due to the pandemic and restrictions surrounding food services. Later in May, schools were authorized to resume full-day, on-campus instruction but with stipulations surrounding locker rooms, eating spaces, social distancing, and masks. During this time, the vaccine was released to the greater population including adolescents 16 years of age or older. Schools needed to reach a 70% vaccination rate among teachers and eligible students to resume on-campus learning. Over the summer holiday, while many families traditionally leave for vacation, a mandated hotel quarantine lasting between 7 - 21 days

1. The initial plan was for baseline data to be collected prior to workshop one, however school disruptions due to the pandemic meant this did not occur.
2. Workshops for the three remaining SEARCH pathways (attention and awareness, habits and goals, strengths) were delivered between June 2022 and February 2023.

was in place. The duration of quarantine was dependent upon the vaccination status of persons traveling. This prevented and shortened travel plans as the vaccines were not yet available to children under the age of 16 (Centre for Health Protection, 2023) [17].

The 2021/22 academic year started on campus, albeit with many regulations. Social distancing, masks, eating spaces, and physical education regulations were in place as protective measures against covid. Campus closures and quarantine of close contacts were occurring during this time as instances arose. One positive case on a school campus would cause a one-week closure for deep cleaning. If a case was found during the day, the school had to evacuate immediately. This led to daily uncertainty regarding whether the school day would be shifted online at any moment. Rules for mandatory testing, which could lead to isolation or quarantine at one of the government facilities, changed during the time of the intervention which left people confused about current rules and regulations.

The second half of the academic year was severely disrupted by the 5th wave of covid in Hong Kong SAR. Primary students were suspended from on-campus learning starting mid-January 2022, followed by Y7-Y11 students at the end of January. All on-campus learning was suspended from February until mid-April. There was a question of whether all schools in Hong Kong SAR would be allowed to resume online learning or shift the summer holiday to March and April [75]. Some schools and programs that were exam based were allowed to continue the school year online with no displacement of the summer holiday as opposed to schools using the local curriculum. After the Easter, or rescheduled summer holiday in April, schools with over 70% vaccination rates for all eligible populations were allowed to resume full-day on-campus learning. Similar restrictions prior to the campus closing in February were in place with the addition of daily rapid antigen tests (RATs) for all entering school grounds and vaccine passes.

As Covid continued to develop and change, so did the regulations and responses from the Government. During the intervention, there was unpredictability in both the education sector and daily life in Hong Kong SAR. For example, mandatory testing notices were distributed to people if they were in a building for more than two hours at the same time as someone who tested positive for Covid. Government testing centers were created around the city. Pop-up testing facilities were organized around buildings or communities that were flagged for possible cases. Mandatory testing required people to isolate at home until the test results were available. If a person tested positive or was a close contact, the government would isolate the individual, regardless of age (there was cases of 1-year old being taken away from their parents) [76], at a hospital or a government run isolation facility in a remote area to help control the spread of Covid. International travel was rare due to pre-flight requirements, testing, and quarantine regulations upon arrival. During the 5th wave at the start of 2022, some families of students within the school decided to leave Hong Kong SAR, while others had problems returning. Due to these environmental factors, on any given school day when on campus learning was occurring, some students would be listening in on classes via Zoom while others were in the classroom. The teacher would need to design lessons to engage the students online, while also teaching others in the classroom.

Data Analysis Procedure

Data analysis consisted of visualisation of descriptive statistics, specifically boxplots of individual and collective wellbeing. Following descriptive statistics, inferential statistics tested for differences across time. As data matching was not possible, tests of independent groups were utilised rather than repeated measures. As repeated measures generally reduce standard errors by controlling for baseline scores, it is expected that statistical significance tests of independent group differences are more conservative. Inferential tests comprised ANOVAs and MANOVAs, testing for differences across time in individual and collective wellbeing, with separate tests for teachers and students, and one with the combined samples. Where significant differences were found, marginal means were plotted. Simple scale means were analysed as the unit of analysis such that the total scale score was out of 5 (not 30), the range remained the same.

Results

Individual Wellbeing

Teacher and student self-reported wellbeing scores were visualised prior to inferential analysis. Boxplots indicate almost equal scores at each of the three data collection points, showing that wellbeing was stabilized across time (Figure 2).

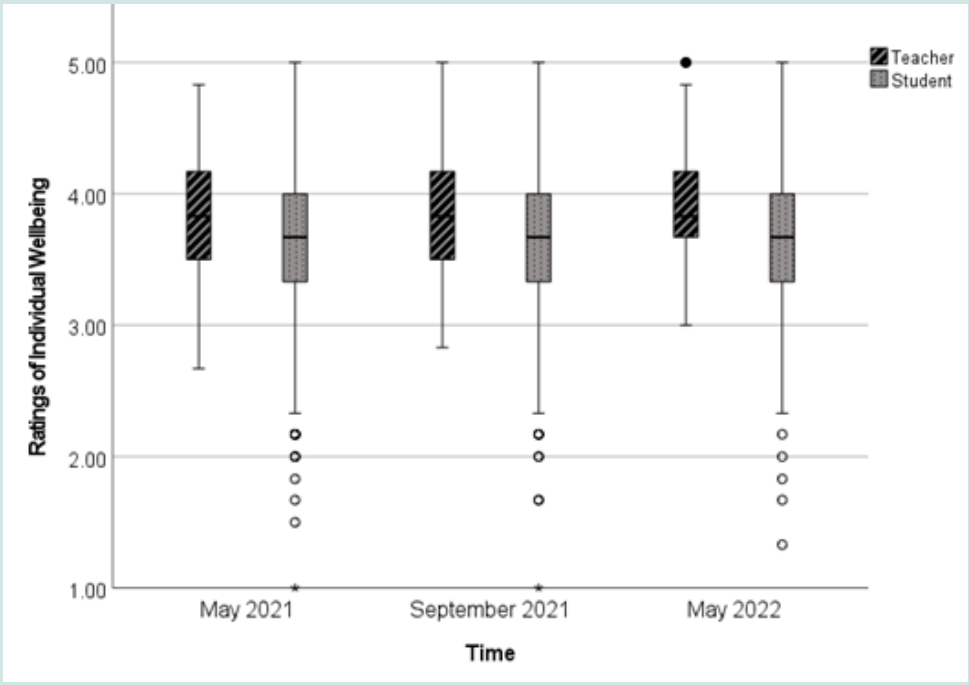

Figure 2: Boxplot of Individual Wellbeing Scores for Teachers and Students across Time.

The means and standard deviations for individual wellbeing scores in teachers were as follows: Time 1 M = 3.82, SD = .48; time 2 M = 3.84, SD = .42, and time 3 M = 3.91, SD = .45. Analysis of Variance (ANOVA) (1 X 1), was used to test whether there were any differences in teacher self-rated wellbeing across time (time 1, time 2 and time 3) and found no significant change: $F(2, 524) = 1.515$, $p<.221$, partial $\eta2 = .006$. The means and standard deviations for individual wellbeing scores in students were M = 3.66, SD = .58 at time 1, M = 3.66, SD = .56 at time 2, and M = 3.68, SD = .57 at time 3. As with the teacher sample, a 1 X 1 ANOVA was used to test whether there were any differences in student self-rated wellbeing across time (time 1, time 2 and time 3) and found no significant change: $F (2, 2227) = .659$, $p < .518$, , partial $\eta2 = .001$.

Implementation Check

As an implementation check, VWB use was measured at time 1 and 3, and tested as moderator of change over time in individual wellbeing. This scale asked students to rate the degree to which VWB strategies and practices were being used in their classes. The VWB Use simple scale mean score was converted to three categories: low, medium and high[4]. A 2 X 1 ANOVA then tested whether VWB Use was related to different mean scores in individual student wellbeing, while also testing whether VWB Use moderated individual wellbeing change over time. VWB Use had a significant main effect, indicating a large contemporaneous relationship between VWB Use and individual wellbeing ($F (2, 1488) = 259.35$, $p < .001$, partial $\eta2 = .258$). The results also showed a significant (albeit small) interaction between VWB and time, indicating participants falling into different VWB Use categories exhibited different slopes from time 1 to 3 ($F(2, 1488) = 3.177$, $p < .042$, partial $\eta2 = .004$).

The change in wellbeing across time was related to the level of implementation of VWB, students in the high VWB Use category had increases in wellbeing, those in medium VWB Use category remained stable, and students who reported low VWB Use in their classrooms had a slight decline in their wellbeing over time. Pairwise comparisons indicate a statistically significant effect over time in the high VWB Use category (MΔ = .120 [.028, .212], se = .05, p <.010), with 95% confidence interval for the remaining two categories including zero (medium use category MΔ = .000 [-.082, .081], se = .041, p <.991; low use category MΔ = -.028 [-.104, .047], se = .039, p <.463). Figure 3 displays the estimated marginal means for individual wellbeing over time, across the three levels of VWB use.

Collective Wellbeing

Teacher Perceptions of Others' Wellbeing across Time

In addition to rating their own wellbeing, teachers also rated the wellbeing they were seeing in their students (Figure 4) and in their colleagues (Figure 5) at Time 1 and Time 3. Prior to conducting inferential testing, the descriptive data was first visualised with Box Plots. Results show that teachers ratings of their students' wellbeing increased from time 1 to time 3, with a higher mean score evident (Table 1) and comparable interquartile range. A similar increase, along with a narrowing of the interquartile range, was evident in teacher ratings of the collective wellbeing they observed in their colleagues (Table 1).

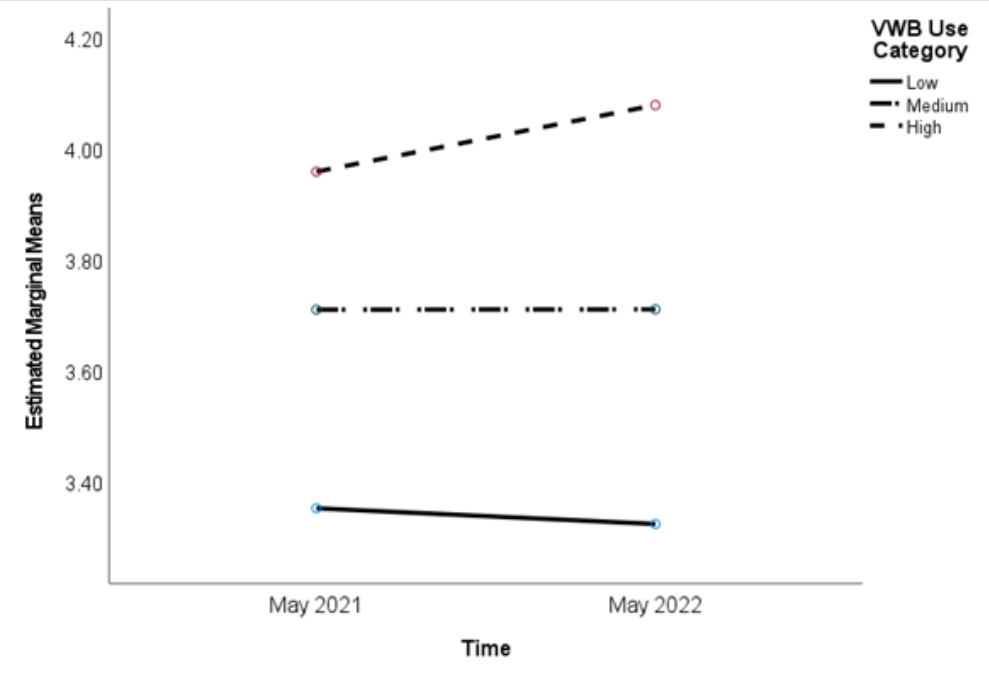

Figure 3: Estimated Marginal Means for VWB Use Categories and Individual Wellbeing, across Time.

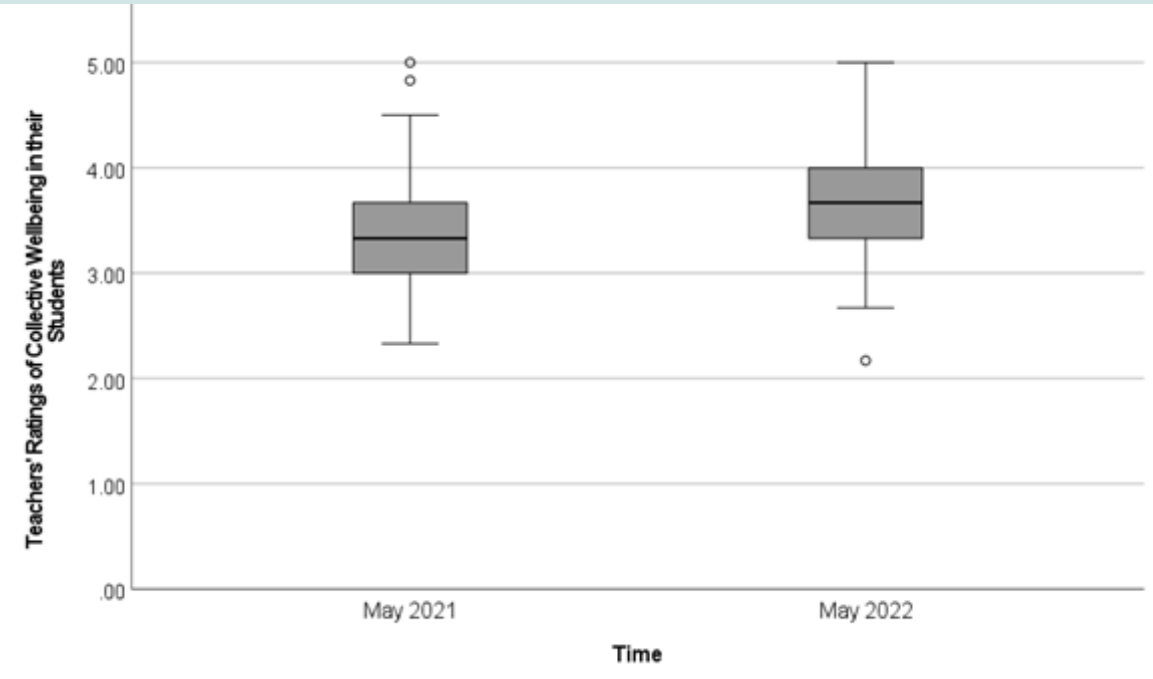

Figure 4: Teachers' Ratings of Collective Wellbeing in their Students.

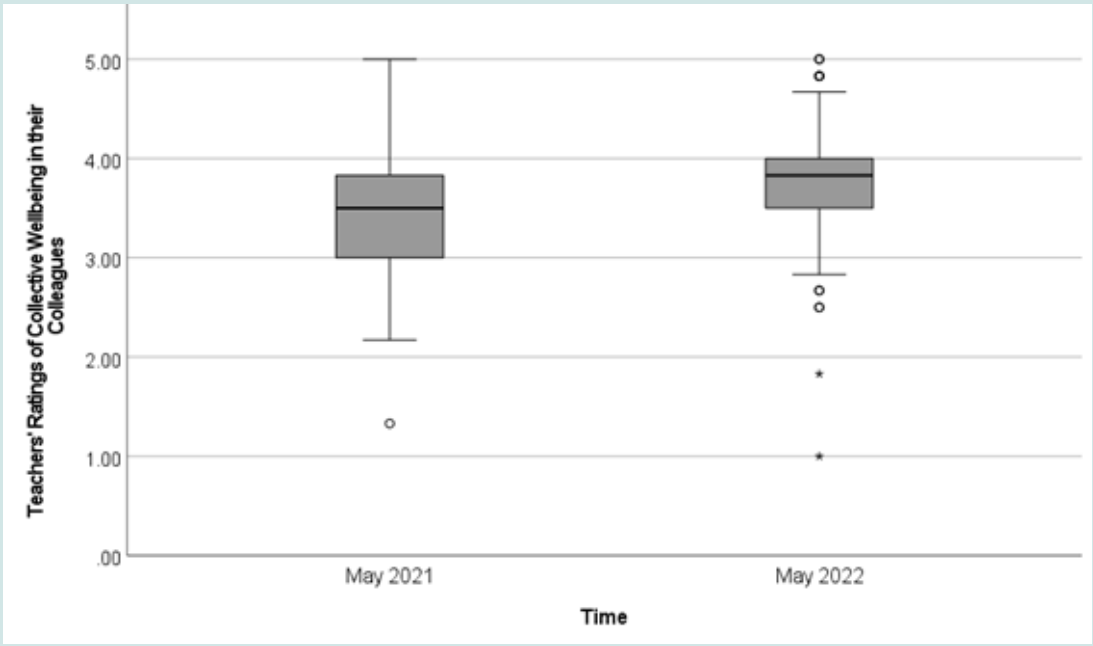

Figure 5: Teachers' Ratings of Collective Wellbeing in their Colleagues.

Table 1: Means, Standard Deviations and Correlation Matrix of Measures, Time 1 and 3.

Sample	Time	Variable	*n*	*M* (*SD*)	1	2	3
Student	May 2021	1. Self	782	3.66 (.58)	1	-	-
		2. Peers		3.54 (.56)	.540**	1	-
		3. Teacher		3.80 (.61)	.506**	.622**	1
	May 2022	1. Self	737	3.68 (.57)	1	-	-
		2. Peers		3.68 (.55)	.615**	1	-
		3. Teacher		3.80 (.61)	.584**	.709**	1
Teacher	May 2021	1. Self	153	3.82 (.48)	1	-	-
		2. Colleagues		3.46 (.58)	.324**	1	-
		3. Students		3.35 (.42)	.280**	.516**	1
	May 2022	1. Self	173	3.91 (.45)	1	-	-
		2. Colleagues		3.73 (.57)	.508**	1	-
		3. Students		3.61 (.49)	.465**	.553**	1

Multivariate Analysis of Variance (MANOVA) found that the collective wellbeing of student and colleagues, as rated by teachers, grew significantly over time, $F(2, 323) = 14.853$, $p < .001$, Wilk's $\Lambda = .916$, with significant univariate ANOVAs present both for students, $F(1, 323) = 18.131$, $p < .001$, partial $\eta 2 = 053$; and colleagues $F(1, 324) = 26.678$, $p < .001$, partial $\eta 2 = 076$. There was a mean increase of .265 for the collective wellbeing of students from time 1 to time 3 (se = .051, $p < .001$); and in colleagues the mean increased by .276, se = .065, $p < 001$.

Student Perceptions of Others' Wellbeing across Time

Between time 1 and 3, students observed a slight increase in the collective wellbeing of their peers to (Figure 6; means and standard deviations are in Table 1). Between time 1 and time 3, students rated the collective wellbeing of their teachers, little change was observed although with a slightly longer tail and interquartile range in time 3 (Figure 7).

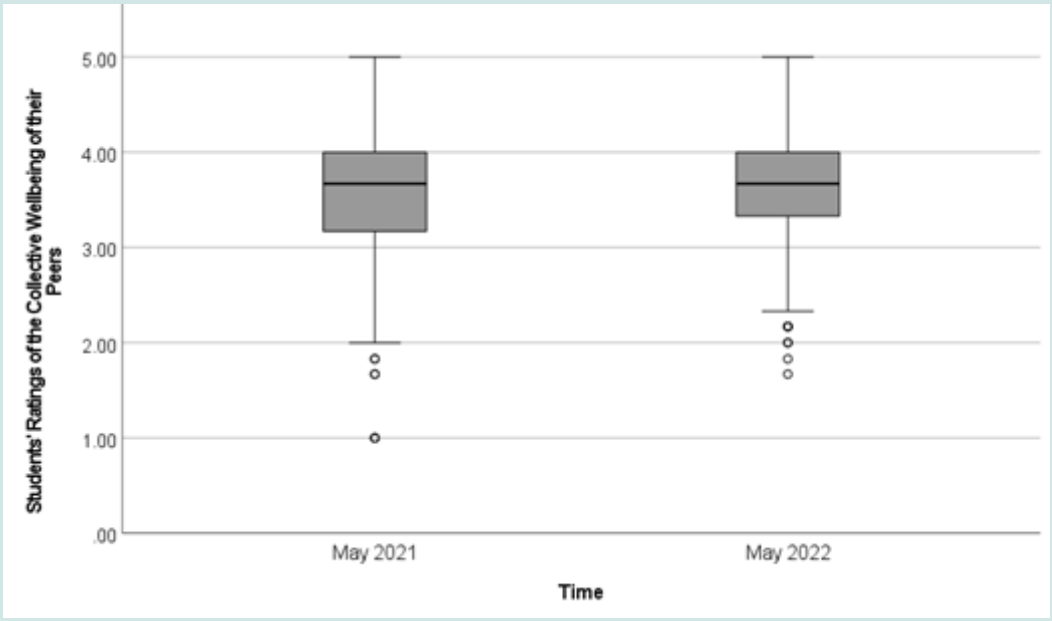

Figure 6: Students' Ratings of the Collective Wellbeing of their Peers.

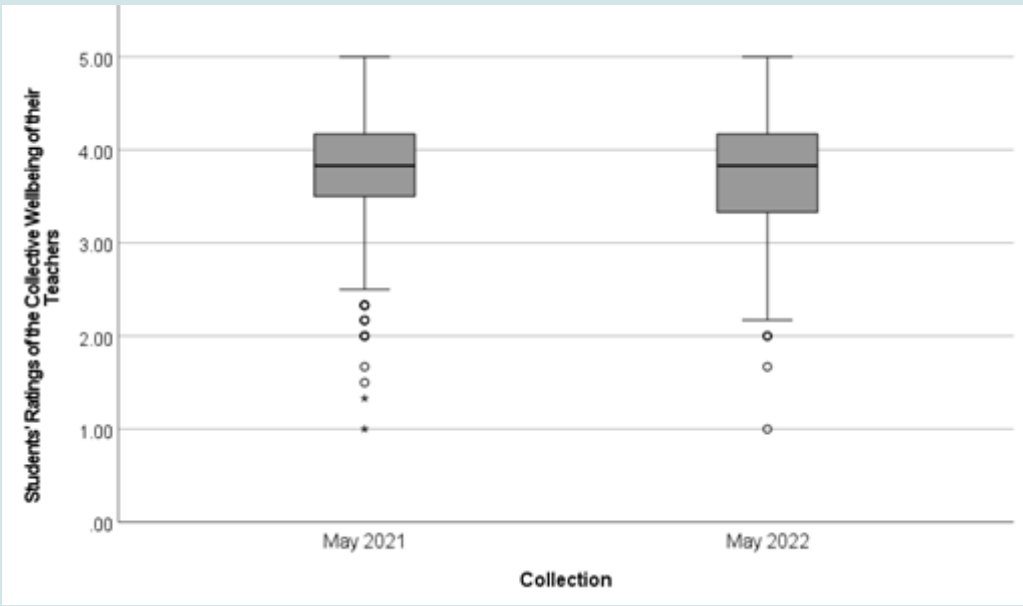

Figure 7: Students' Ratings of the Collective Wellbeing of their Teachers.

A 1 X 2 MANOVA tested for significant differences in the students' ratings of collective wellbeing of their peers and teachers over time (time 1, time 3): $F(2, 1516) = 16.14$, $p < .001$, Wilk's $\Lambda = .98$. Post-hoc univariate ANOVAs confirmed that students' ratings of their peer's wellbeing increased $F(1, 1517) = 18.460$, $p < .001$, partial $\eta 2 = 012$. However, students did not see any changes in teacher wellbeing $F(1, 1517) = .005$, $p < .945$, partial $\eta 2 = .000$. Marginal means for time 1 and 3 in students' ratings of peer wellbeing are presented in Figure 8.

To test whether school level moderated this effect, an additional factor of school level (primary or secondary) was included as an interaction term in a 2 X 2 MANOVA. The interaction term in the omnibus model was non-significant ($F(2, 1514) = 1.21$, $p < .294$, Wilk's $\Lambda = .99$, as was the interaction terms in the univariate ANOVAs, for peers ($F(1, 1515) = 2.42$, $p < 120$, partial $\eta 2 = .002$); and for teachers ($F(1, 1515) = .82$, $p < .367$, partial $\eta 2 = 001$).

Combined Sample Collective Wellbeing

Combining the teachers and students scores of collective wellbeing of others, a significant increase was found over time: $F(1, 1843) = 32.411$, $p < .001$, partial $\eta 2 = .017$. Estimated marginal means are presented in Figure 9.

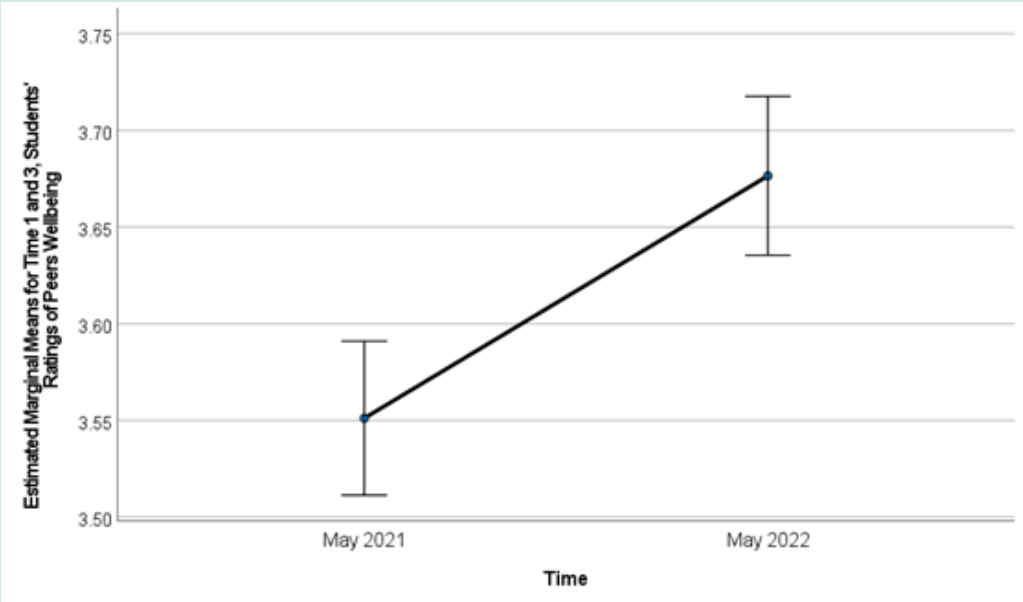

Figure 8: Estimated Marginal Means for Time 1 and 3, Student's Ratings of Peer Wellbeing.

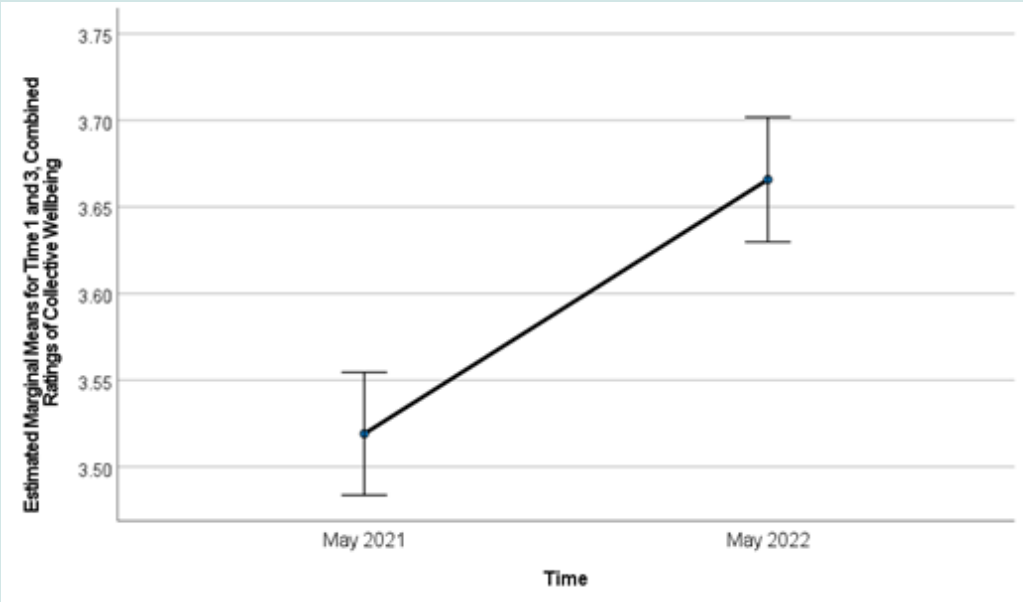

Figure 9: Estimated Marginal Means for Time 1 and 3, Combined Ratings of Collective Wellbeing.

Relationships between Individual and Collective Wellbeing

Pearson's correlations were produced to examine the cross-sectional relationships between students rating of their individual wellbeing with their collective ratings of their peers and their teachers at time 1 and time 3. The same analysis was undertaken with the teacher sample. Both individual and collective wellbeing ratings were significantly correlated at each time point (Table 1). Additionally, the connections between the ratings strengthened from time 1 to time 3. This occurred for self and peer ratings in both the teacher and student samples.

Finally, to explore whether changes in individual wellbeing was related to changes in collective wellbeing over time, the aggregate change in each measure was examined at time 1 and 3. Results showed that when teachers saw wellbeing go up in their students (MΔ = .25, SE = .04), their own wellbeing scores also went up (MΔ = .07, SE = .04). Similarly, when teachers saw wellbeing go up in their colleagues (MΔ = .27, SE = .05), their own wellbeing scores went up (MΔ = = .07, SE = .04). For students, as the collective wellbeing of their peers increased (MΔ = .12, SE = .03) so too did their own wellbeing (MΔ = .02, SE = .03) (Figure 10).

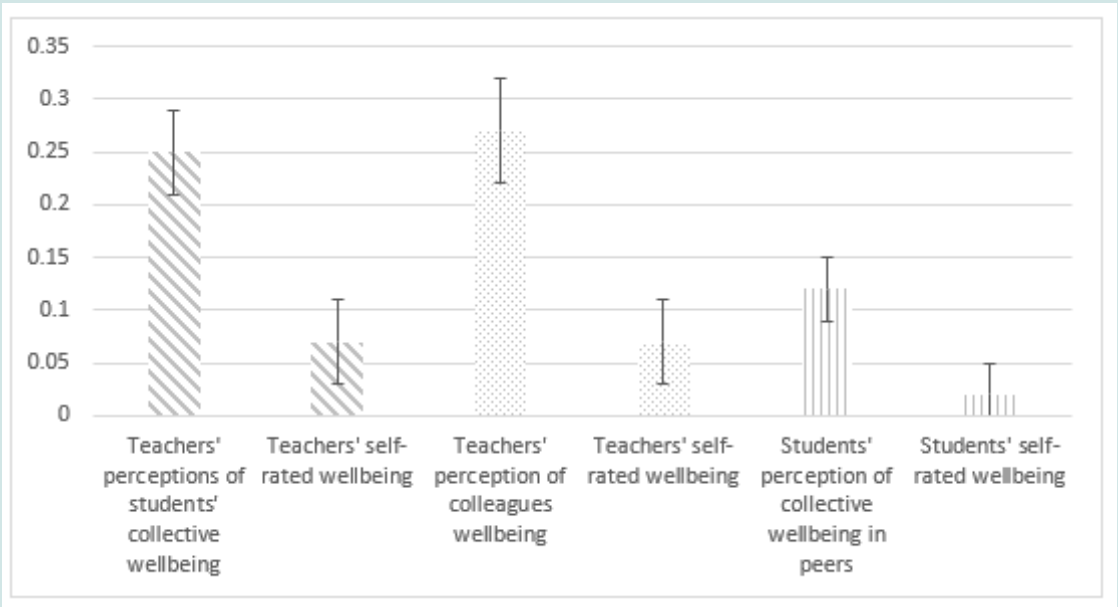

Figure 10: Mean Change in Individual and Collective Wellbeing across Time: Students and Teachers.

Discussion

Maintaining the positive end of the mental health continuum - wellbeing - through times of crisis is essential [22,77,78]. Yet, longitudinal findings show that the Covid-19 pandemic has led to significant deteriorations in positive affect, hope, life satisfaction, family satisfaction, mood, vitality, coping, and quality of life for students and teachers. The current longitudinal study adopted a positive prevention approach to test whether a mental health intervention could help to avert declines in students and teachers' wellbeing during the pandemic.

Across the one-year time frame of this study, from May 2021 to May 2022, the Covid-19 infection case numbers were peaking globally due to the new Omicron strain of the virus. Subsequently, people in Hong Kong SAR were living under strict and frequently changing regulations. As discussed in the method section, the students and teachers at the school who participated in the intervention were cycling through remote and on-campus learning, quarantine, isolation, daily testing procedures, compulsory protective equipment, physical distancing, density limits and so on. Pandemic fatigue, the gradually emerging subjective state of weariness and exhaustion due to the COVID-19 related restrictions, had set in [79-81].

Individual Wellbeing

Despite this adversity and fatigue, the individual wellbeing scores for teachers and students participating in the intervention did not decline over time, but instead stabilized for the course of the intervention. This result provides support for hypothesis one, however, without a control group, we cannot be certain that the results are showing a prevention effect of the intervention itself. Perhaps wellbeing would have remained stable regardless of the intervention? However, when considering the pandemic conditions that this Hong Kong SAR school was experiencing and taking into account the declines in wellbeing found for students and teachers across other countries, it seems unlikely that we would expect wellbeing not to decline.

The severity of the context lends confidence to the idea that the intervention had a buffering impact. Teachers who were learning strategies for effective coping, emotional management and building positive relationships, were encouraged to use these strategies to safeguard themselves against declines in wellbeing. In addition, the teachers were provided with resources to bring these strategies into their classrooms (albeit virtual classrooms for periods of time) to help protect the wellbeing of their students. Indeed, there was a significant relationship between students own wellbeing and the degree to which they rated VWB practices being used in their classrooms. At each time point, there were significant differences in student individual wellbeing corresponding to low, medium and high ratings of VWB Use. The students who felt VWB was in high use in their classrooms had the highest levels of wellbeing. Additionally, the experience of high use of VWB in class was associated with an increase in individual wellbeing scores from May 2021 to May 2022. Thus, hypothesis two of this study was supported.

The field of positive psychology has helped to clarify that illbeing and wellbeing are two distinct, yet interrelated, states, sitting along the mental health continuum [82]. The research has also shown that having low levels of wellbeing puts a person's mental health at risk, even in the absence of symptoms of illbeing [11]. The benefits of high wellbeing have been studied over many decades. For example, in a classic illustration of the mind–body connection, scientists have shown that people with high levels of wellbeing are less likely to catch the common cold [83] and are more likely to

bounce back faster from serious illness [84]. The biologically-protective results of having high wellbeing provide added importance for the need to maintain wellbeing during a pandemic. On top of that, research shows that positive emotions help us to think more creatively and solve problems more effectively [85] – two cognitive resources which are needed to navigate the uncertainty and constant change experienced during this pandemic. Finally, meta-analytic results show that students who complete social-emotional learning programs demonstrate an 11-percentile-point increase in academic achievement relative to students in control groups (note, this was in pre-pandemic times) [86]. All these findings validate the benefits of implementing school-based interventions that are designed to protect wellbeing during the pandemic.

Collective Wellbeing

In addition to tracking the individual wellbeing scores over time, this study asked teachers and students to rate the levels of collective wellbeing they were seeing in others at their school. Teachers' ratings of the collective wellbeing in their students and colleagues increased significantly over time. Students saw the collective wellbeing of their peers rise from the start to the end of the intervention, but reported no change in the level of collective wellbeing they saw in their teachers. These results differ to what was predicted in hypothesis three, which stated that collective wellbeing would remain stable. Instead, when teacher and student ratings were combined, there was an overall significant growth in collective wellbeing which suggest that the intervention served to protect (i.e., stabilize) wellbeing at the individual level and promote (i.e., grow) wellbeing at the group-level.

Observing the collective wellbeing of others across the school is important because past research has shown that the wellbeing of the community spills-over to individual wellbeing [44,73]. For example, social network analyses done by Fowler and Christakis [87] in a large community cohort demonstrated that individual wellbeing is also shaped by the positive affect and wellbeing spread among people in that community. The results of the current study align with past findings and show significant correlations between individual wellbeing and collective wellbeing. Additionally, the change score analysis showed a small, but consistent, trend that as one observed the wellbeing of others increase, their own wellbeing also went up. These results, thus, support hypothesis four and align with Roy et al.'s [46] contention that "Well-being at the community level influences well-being at the individual level" (p. 1081). The value of asking people to consider the levels of collective wellbeing that surrounds them is particularly beneficial during a time of crisis [44] because it prompts us to step outside of our own inner experience and see that we have group-level resources (e.g., collective wellbeing) to draw upon to gain strength. As Mukherjee and Mandal [45] state "Remarkable insights have been obtained by observing other peoples' positively oriented reactions under extremely threatening situations" (p.114).

Strengths, Limitations and Future Research

The findings of this study must be considered within its strengths and limitations. In terms of limitations, this study was unable to collect true, pre-intervention, baseline measures. Although the plan was to collect data ahead of the first workshop, pandemic disruptions at the school prevented this from occurring. It is possible that the first workshop covering a general introduction (but not yet going into the SEARCH pathways) had a positive boost to wellbeing and this may have altered the time one wellbeing scores compared to a true baseline measure. Adding to this, the school had been engaged in a positive education approach for many years prior to the current intervention and this was likely to have buffered wellbeing and prevent the decline in wellbeing scores.

This brings us to the second limitation which is the lack of a control group. Ideally, a control group with a suitably matched school that did not undergo the VWB intervention, would have helped to pinpoint the effect of the intervention with more confidence. With that said, merely observing student wellbeing and illbeing during this pandemic, without an intervention that attempts to improve outcomes, may be potentially unethical, as the weight of evidence indicates broad declines in many variables and samples. As such, future studies could include a suitably matched waitlist control group, to determine whether wellbeing definitely declined, on the same measures, in a similar context, without the VWB intervention.

Thirdly, the provision of anonymity to participants precluded the ability to match data across waves. This necessitated the use of independent group statistics. This means repeated-measures analyses were not possible and, thus, baseline scores of individual participants baseline could not be controlled for. Future studies that match data will help to verify the results.

The current study utilized a self-report measure for individual wellbeing which may have biased the results with a socially desirable response [88]. For instance, teachers and students may have inflated their scores to avoid feeling embarrassed about having low wellbeing. The anonymity (a weakness that led to being unable to match the data) is a strength in this context because participants knew their personal scores could not be traced, and thus, may be less likely to answer in socially desirable ways.

In the context of the pandemic, Wang [89] suggest that 'other-rated measures' are a useful addition to increase the validity of self-report findings. Having participants also assess the levels of collective wellbeing for teachers, students, peers and colleagues, is a strength of this paper because these variables were the aggregate of the views of all school members and, thus, are not just the view of one individual who may be seeking to preserve the way they look. Moreover, the fact that collective wellbeing scores were, on average, higher than individual scores dampens the idea that participants may have inflated their own results. If social desirability was present in self-rated individual wellbeing it would be expected that the individual scores would be higher than the collective scores.

The measures of wellbeing utilised in the study were tailor-made and had strong content validity (with item wordings similar to more established measures of SEARCH capacities) and good internal reliability. However, the measures have not yet been sub-

jected to more extensive validity and reliability tests. Future studies could validate the tool further, including by fitting confirmatory factor analysis, and utilising modelling that controls for measurement error in the form of structural equation modelling, rather than simple scale mean scores.

Implications

There are two major implications stemming from the current research. First, it is important to put in place interventions that target the wellbeing end of the mental health continuum. Historically, this has not been the case in schools where the focus has been on preventing illbeing [6] without recognising that low wellbeing is also a risk factor for mental illness. In times of intense crisis, such as COVID-19, it is understandable that schools are rushing to stem the rise in distress, but this can mean that the importance of preventing reductions in wellbeing is overlooked. As stated by Waters [78] "addressing the ways in which people are wounded and weakened…need not come at the expense of also investigating the ways in which people are sustained and strengthened" (p.303).

The second implication gained from this study is the value of implementing whole-school interventions. The VWB intervention trained all teachers and staff across the school and provided instruction and resources for how the strategies and practices would be delivered to all students. This is a different approach to the published mental health pandemic interventions cited in the introduction of the current paper where interventions used small groups of teachers and were run outside of the school [41] n = 66 female teachers; [42], n =35 teachers; [43] n = 36 pre-service teachers) or were focused only on students [37-39,90]. García-Álvarez, Soler and Achard-Braga [91] recommend that interventions during the Covid-19 pandemic need to adopt a "context-based approach" delivered within the school (even if virtually) to "promote goals to empower teachers through teaching practices that integrate wellness practices into their curricula" (p.3).

Whole-school approaches may be more efficient and effective than focusing on individuals or sub-groups as they impact a larger number of people simultaneously, thus creating a shared language, shared understanding and shared journey which further magnifies the [92]. Additionally, because whole-school interventions include all stakeholders they allow both individual-level and collective-level wellbeing to improve.

Conclusion

Of all the institutions negatively affected by the current pandemic, schools are arguably one of the worst hit (UNESCO, 2020). Accordingly, the World Health Organization has targeted student wellbeing as a top priority during the COVID-19 crisis (WHO, 2020). Calls have also been made to better support teacher wellbeing at this time [93]. Yet, as stated by Mead [77] "Research has highlighted adverse impacts of COVID-19 on wellbeing but has yet to offer insights as to how wellbeing may be protected." (p 1) [94-98]. The current study tested the protective effects of a whole-school intervention on wellbeing in students and teachers. Several gaps in the literature were addressed including the use of a longitudinal, intervention design, the use of a school in Hong Kong SAR [99-101], measures of individual and collective wellbeing, research with teachers and the adoption of a positive prevention approach. While more research is needed, the results of this study are promising and provide hope that schools can find evidence-based ways to support and stabilize the wellbeing of their teachers and students during times of adversity.

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