

Exploring the potential common psychotherapeutic factors: use of cognitive behavioural therapy, mindful yoga and positive psychology in enhancing the well-being of students with SENs in Hong Kong

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This study examined the effects of cognitive behavioural therapy (CBT), mindful yoga and positive psychology interventions and identified common psychotherapeutic elements that exert critical treatment effects on Hong Kong Chinese students with special educational needs (SENs). Forty-seven participants received CBT intervention while 42 and 41 participants received mindful yoga and positive psychology interventions, respectively (N = 130). Mixed ANOVAs revealed no significant interaction effect between time and intervention condition on any outcome variables. However, within-subjects ANOVA revealed significant improvements in some dimensions within each intervention, including areas of behavioural problems, positive feelings and positive relationships. Changes in negative automatic thoughts were also found to lessen negative emotions in all three interventions. This study ascertained the differential effects of the selected approaches in ameliorating negative emotion, reducing behavioural problems and enhancing positive relationships among students with SENs in various treatment approaches. In addition, this study highlighted several common psychotherapeutic elements, which could potentially serve as important factors and constitute the formulation of an integrative psychotherapeutic framework for enhancing the well-being of students with SENs in Hong Kong. Finally, implications for practice and the possible development of an integrative intervention model were discussed.

Introduction

Students with special educational needs (SENs) refer to students who have learning difficulties requiring special educational support (Maher, 2013). Significant types of SENs include specific learning difficulties (SLD), attention deficit and hyperactivity disorder (ADHD), autistic spectrum disorder (ASD), speech and language impairment, hearing impairment, visual impairment, physical disability and intellectual disability (Hughes, Banks, and Terras, 2013; Legislative Council, 2014).

Researchers have reported that 13–20% of the school-age population can be identified as having SENs, and the prevalence has remained steady over the past three decades (Benn, Akiva, Arel, et al., 2012). In Hong Kong, the number of students with SENs in public sector mainstream schools in the 2017–2018 school year increased by 34.1%, from 33 830 to 45 360, since the 2013–2014 school year; In 2019, about 8000 students with SENs attend special schools in Hong Kong (Legislative Council Research Office, 2019). ASD, ADHD and dyslexia constitute the most common types of SENs diagnosis among students in Hong Kong.

Although students with different types of SENs present a range of different symptoms, most of them reported similar emotional and behavioural problems as well as academic difficulties. A body of research has documented that children and adolescents with SENs are at greater risk of poorer adjustment outcomes compared with typically developing ones (Hughes et al., 2013). Due to this poorer adjustment ability, students with SENs often face a variety of challenges at school, including interpersonal relationship, emotional and behavioural issues and academic performance. In addition, students with SENs demonstrate poorer academic ability (Humphrey,

Wigelsworth, Barlow, et al., 2013), higher levels of depression and anxiety (Rose, Howley, Fergusson, et al., 2009), greater externalising and internalising behavioural problems (Mather and Ofiesh, 2005) and poorer social skills (Tur-Kaspa, 2002). Despite the increasing number of students with SENs in Hong Kong and their mounting unmet psychological needs, very few evidence-based interventions are designed for this group of students. The challenges and problems encountered by students with SENs emphasise the importance of developing intervention programmes to improve their emotional and behavioural adjustments, thus prompting the present study. Students with SENs often face difficulties in attention focus during lessons and have poorer social interactions with classmates. Therefore, it is crucial to select certain approaches for testing their effectiveness in enhancing SEN students' positive relationship with others. In this study, we chose cognitive behavioural therapy (CBT), mindful yoga and positive psychology approach, which can be relatively easily carried out through classroom-based activities and are commonly used in intervention programmes to support students with SENs in school settings in Hong Kong.

Cognitive behavioural therapy

Cognitive behavioural therapy is one of the most extensively researched forms of psychotherapies that have demonstrated efficacy in treating a wide variety of disorders and problems in adults, adolescents and children (Butler, Chapman, Forman, et al., 2006). The psychotherapeutic highlights of CBT focus on guiding an individual's behaviours by helping them develop cognitive strategies to identify and challenge dysfunctional thoughts (Durlak, Fuhrman, and Lampman, 1991). CBT has been a well-known treatment approach to tackle the associated emotional or behavioural problems for students with SENs. The adapted CBT programmes for children with ASD commonly address some contextual factors that lead to social anxiety, such as autism-associated stressors, and communication difficulties and are found effective in tackling the anxiety symptoms for children with ASD (Wood, Kendall, Wood, et al., 2020). Ho, Stephenson, and Carter (2014) undertook a meta-analysis of 10 studies examining the efficacy of CBT for children with ASD, and the results showed large treatment effects on children's anxieties and social skills. Besides, the use of CBT is found beneficial for those with ADHD and dyslexia, which intends to help them reduce the related symptoms and problems, and enhance their well-being. It is evident that CBT programmes for adolescents with ADHD normally involve focussing on their learning behavioural and communication skills, reducing distractibility and anger and facilitating active listening (Safren, Otto, Sprich, et al., 2005). In addition, Antshel, Faraone, and Gordon (2012) found that adolescents with ADHD and a comorbid anxiety or depression could benefit more from the CBT intervention than those with oppositional defiant disorder. Lastly, CBT was found to be an effective

approach to enhance the positive self-evaluation, learning motivation and cognitive performance among students with special reading disabilities such as dyslexia (Zafiropoulou and Mati-Zissi, 2004). Cognitive reappraisal learnt in CBT programmes might facilitate students with dyslexia to have a more positive reframing and build up their confidence when facing challenges related to learning disabilities. Thus, it is believed that changing negative automatic thought in CBT intervention could potentially help students with SENs improve the associated emotional and behavioural symptoms and enhance their social adjustment.

Despite the fact that there is ample evidence to support the effectiveness of CBT for students with SENs regarding their depression, anxiety, self-esteem, problem-solving, offending behaviours and anger management (Antshel et al., 2012; Sams, Collins, and Reynolds, 2006; Scarpa and Reyes, 2011), there is still a lack of understanding of how the underlying psychotherapeutic mechanisms in CBT can generate these positive outcomes among students with SENs. This study endeavoured to engage in such exploration.

Mindful yoga

Mindfulness is defined as 'the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience' (Kabat-Zinn, 2003, p. 145). The psychotherapeutic mechanism of mindful yoga primarily focusses on the cultivation of mindful awareness of the body during stretching, moving or holding a position, and at the same time cultivating awareness through performing different postures, concentration techniques, breathing practices and deep relaxation.

Mindfulness-based programmes are viewed as effective approaches for children and adolescents with a variety of SENs to improve their sense of coherence and executive functioning, which can help reducing their neurocognitive deficits (Ridderinkhof, Bruin, Blom, et al., 2018). Mindful practice helps children with ASD shift their attention and become more focussed (Segal, Williams, and Teasdale, 2018). For adolescents with ADHD, mindfulness training allows them to focus on enhancing the attention control and reduce automatic responses (Teasdale, Segal, and Williams, 1995). Mindfulness training is also known as a well-established method to enhance the attentional capacities and metacognitive skill for people with dyslexia (Keller, 2016). By practising emotion awareness, mindfulness-based programmes help adolescents with SENs better understand the emotional processes and behaviours of others, which improves the theory of mind and coping abilities (Ridderinkhof et al., 2018).

In school settings, mindful yoga interventions have demonstrated academic, cognitive and psychological benefits for students (Ferreira-Vorkapic, Feitoza, Marchioro, et

al., 2015). They have also been shown to benefit students with a variety of SENs, enhancing their awareness of emotional state through practical and well-rehearsed techniques (Peck, Kehle, Bray, et al., 2005). According to a systematic review conducted by Semple (2019), a number of studies have reported some positive effects on social, emotional and behavioural domains in children and adolescence with ASD after mindfulness-based training with yoga. Mindful yoga interventions have also been found to reduce inattentiveness, hyperactivity and impulsiveness in children with ADHD and other disabilities (Grosswald, Stixrud, Travis, et al., 2008). Lastly, mindfulness training also reduced impulsivity and enhanced the sustained attention among people with dyslexia and ADHD (Tarrasch, Berman, and Friedmann, 2016). Therefore, there is strong evidence that mindful yoga which could help improve the well-being of students with SENs (such as stabilising emotional states and reducing behavioural problems) by enhancing their mindful awareness and attention.

The benefits of mindful yoga for children with SENs have mostly been investigated in overseas studies, but very few local studies have been conducted on Chinese children and adolescents with SENs (Lo, Wong, Wong, et al., 2020). In view of the possible benefits of mindful yoga for students with different kinds of SENs, there is a need to further investigate the psychotherapeutic mechanisms in mindful yoga that constitute the improved outcomes among students with different types of SENs.

Positive psychology

Positive psychology refers to the study of positive emotions, positive character traits and positive patterns of behaviours (Kwok, Gu, and Cheung, 2017). It plays a unique functioning role from a strength-based instead of a pathology-based perspective. A positive psychology intervention is a psychological training, exercise, or therapy designed to promote positive feelings, cognition or behaviours (Sin and Lyubomirsky, 2009). Martin Seligman introduced the PERMA Model which is comprised of five core elements: positive emotion, accomplishment, meaning, engagement and relationship (Seligman, 2012). Building positive relationship in school settings is especially essential to the well-being of students. A study conducted by Diener and Seligman (2002) found that the happiness level of students was associated with coping strategies, which can be well facilitated by social support. Students with SENs often have deficits in communication and getting along with their classmates. Hence, it is believed that building positive engagement and relationships through positive psychology programmes could help students with SENs to enhance their well-being, which in turn improve their emotion, learning and problem-solving skills (Isen, Daubman, and Nowicki, 1987).

Positive psychology programmes are useful for helping individuals with ASD to facilitate proactive behaviours and social skills and to stay away from negativity and

immobility (Zager, 2013). In school settings, positive psychology programmes emphasise the enhancement of the functioning and well-being of children with ADHD by capitalising their areas of strength and building resilience (Climie and Mastoras, 2015). It is also evident that the approach of positive psychology can help people with dyslexia address the reading and learning challenges and build their inner strengths and potentials, which allowed them to develop the strategies that suit them the best (Kannangara, Griffiths, Carson, et al., 2015). Waters' (2011) review of school-based positive psychology interventions provides further evidence of the effectiveness of positive psychology interventions in enhancing students' gratitude, optimism, resilience, self-efficacy and academic performance. Research on promoting strengths in adolescents with disabilities has suggested the importance of promoting positive characteristics to facilitate positive outcomes in adolescents with or without disabilities (Shogren, Lopez, Wehmeyer, et al., 2006). Thus, it is believed that the approach of positive psychology could help students with SENs develop their strengths, positive attitudes and engagement, which support them to overcome the challenges arising from different domains of associated symptoms.

Towards an integrative psychotherapeutic framework for students with SENs

Integrative psychotherapy refers to the flexible and inclusive application of different psychotherapeutic models, which include four possible approaches: theoretical integration, technical eclecticism, assimilative integration and common factors approach (Zarbo, Tasca, Cattafi, et al., 2016). It is often believed that no single psychotherapy can perfectly fit the specific condition of each client. That is, no one single model or approach can adequately address all problems and needs of clients, including students of SENs (Norcross and Goldfried, 2005). Hence, an integration of appropriate psychotherapies could be an innovative approach, which efficiently amalgamates different theoretical models and their key psychotherapeutic techniques in working with a specific target group. It highlights the value of flexibility in combining different psychotherapeutic elements to maximise the psychotherapeutic effects for clients, depending on their problem nature and characteristics. In view of the challenges faced by students with SENs having comorbid conditions of emotional and behavioural problems, it is essential to develop an integrative psychotherapeutic model, which brings together significant psychotherapeutic elements from various psychotherapies to tackle a variety of associated symptoms found in SEN students. Since CBT, mindful yoga and positive psychology are some commonly used intervention programmes for students with SENs at school in Hong Kong, it is of great value to advance the conceptual or theoretical knowledge by pinpointing the specific significant psychotherapeutic elements in each approach for students with SENs. This study serves as a pioneering work to illustrate the possibility of an

integrative psychotherapeutic framework for students with SENs by incorporating theoretical concepts from several effective psychotherapeutic approaches.

Knowledge gap

Despite the highlighted benefits of CBT, mindful yoga and positive psychology interventions for children or adolescents with SENs, several knowledge gaps remain to be addressed. First, previous studies have revealed significant positive effects of CBT, mindful yoga and positive psychology intervention, mainly in groups of children or adolescents with SENs in English-speaking societies. However, such studies have rarely been conducted in the Asian, non-English-speaking societies. Second, there is little understanding of how these three interventions promote psychotherapeutic effects among students with SENs, and there is a need to explore the mechanisms of change brought by these three approaches. In summary, our study investigated the effects of CBT, mindful yoga and positive psychology interventions for secondary school students with SENs in Hong Kong and attempted to explore the common psychotherapeutic factors underlying these treatments for secondary school students with SENs. The ultimate objective of the study was to propose an integrative psychotherapeutic framework, based on the commonly identified psychotherapeutic factors, for optimising the psychotherapeutic effects in treating students with SENs.

Hypotheses

The study had six hypotheses:

1. Participants in all three approaches of intervention would report improvement in negative emotions, behavioural problems and positive emotions.
2. Participants in all three approaches of intervention would report improvement in negative automatic thoughts, mindful attention and awareness and positive relationship.
3. In the CBT condition, changes in negative automatic thoughts would be related to changes in negative emotions, behavioural problems and positive emotions.
4. In the mindful yoga condition, changes in mindful attention and awareness would be related to changes in negative emotions, behavioural problems and positive emotions.
5. In the positive psychology condition, changes in positive relationship would be related to changes in negative emotions, behavioural problems and positive emotions.
6. There are some common psychotherapeutic factors for positive outcomes that could be found across the CBT, mindful yoga and positive psychology conditions.

Method

Research design and procedures

This study adopted a randomised multiple-treatment design. Staff of the central administration of the Yan Chai

Hospital Social Service Department randomly assigned the use of the three approaches in three different schools in the same district in Hong Kong. In other words, each district will have three schools using one of three different intervention approaches, namely CBT, mindful yoga and positive psychology. Participants were recruited from the schools served by the school social service teams of the Yan Chai Hospital Social Services. Inclusion criteria for participants were as follows (1) Chinese students, (2) able to understand Cantonese and (3) diagnosed with SENs. Those who had severe mental illness and suicidal ideation or attempt in the past 3 months prior to intervention were excluded.

A total of 130 participants were randomly assigned into three conditions: (1) CBT, (2) mindful yoga and (3) positive psychology, depending on the specific school he/she was studying. Participants in each intervention condition received eight intervention sessions from social workers specifically trained in the three treatment modalities. Six rounds of CBT, mindful yoga and positive psychology groups with 7–8 participants in each group were run between September 2017 and May 2019. The protocol for each intervention condition is listed in Appendices A–C. Participants completed a standardised questionnaire before the treatment and immediately after the treatment. Consent forms of participation were signed by their parents. The ethics approval has been obtained by the Human Research Ethics of Committee at the University of Hong Kong (EA1707011).

Instruments

Depression, anxiety and stress scales (DASS-21). Participants' negative emotional states were measured by DASS-21 (Lovibond and Lovibond, 1995), a self-report scale designed to measure participants' affective states of depression, anxiety and stress. The Chinese version of the DASS was validated by Li, Tang, Guo, et al. (2012). This 4-point Likert scale consists of 21 items. The score of each subscale was calculated by the summation of the scores of the corresponding items. In this study, the scale attained a high level of internal consistency, with Cronbach's α s of 0.825 for depression, 0.827 for anxiety and 0.825 for stress.

The brief problem monitor. Participants' behavioural problems were measured by the brief problem monitor (BPM) (Achenbach, McConaughy, Ivanova, et al., 2011), a 19-item questionnaire designed to evaluate the reduction of behavioural problems and the improvements of adaptive functioning. This 4-point Likert scale comprises three subscales, internalising (INT), externalising (EXT) and attention problems (ATT). A Total Problems (TOT) score is obtained by summing all the scores of 19 items. In this study, the TOT score obtained a high level of internal consistency, with a Cronbach's α of 0.91. Moreover, the INT, EXT and ATT

subscales also achieved a high level of internal consistency, with Cronbach's α s of 0.88, 0.80 and 0.83, respectively.

The positive emotion subscale of the scale of positive and negative experience. The scale of positive and negative experience (SPANE; Diener, Wirtz, Tov, et al., 2010) is 12-item scale designed to measure both positive and negative feelings such as pleasure, interest, pain and boredom. In this study, the positive emotions subscale of the SPANE was used to measure positive emotions by examining the change in positive feelings experienced by participants following the interventions. It was scored using a 5-point Likert scale. The Chinese version of the SPANE shows satisfactory factorial validity (Bagozzi, Wong, and Yi, 1999). In this study, it showed high internal consistency, with a Cronbach's α of 0.89.

The child automatic thoughts scale. The child automatic thoughts scale (CATS; Schniering and Rapee, 2002) is a 40-item scale developed to assess the occurrence of negative automatic thoughts related to internalising and externalising problems in the past week. All items are rated on a 5-point Likert scale. In this study, the CATS score obtained a good reliability score of 0.97. Moreover, the physical threat, social threat, personal failure and hostility subscales each achieved a high level of internal consistency, with Cronbach's α s of 0.90, 0.91, 0.94 and 0.88, respectively.

The mindful attention and awareness scale – adolescent. The state of mindful attention and awareness was measured using the Mindful Attention and Awareness Scale – Adolescent (MAAS-A) constructed by Brown, West, Loverich, et al. (2011). It is a 14-item scale measuring the level of mindfulness. All items are rated on a 6-point Likert scale. A higher score indicates a higher trait of mindfulness. In this study, the scale attained high internal consistency, with a Cronbach's α of 0.92.

The relatedness subscale of the children's intrinsic need satisfaction scale. In this study, positive relationships were measured by the Relatedness subscale of children's intrinsic need satisfaction scale (CINSS; Véronneau, Koestner, and Abela, 2005). This subscale is used specifically to assess satisfaction of children's needs for relatedness in different contexts (at home, at school and with friends). All items were measured on a 3-point Likert scale. In this study, the subscale attained high level of internal consistency, with a Cronbach's α of 0.81.

Statistical analysis

Demographic differences between the three groups of participants were examined using chi-square for categorical variables and *t*-test of independence for continuous variables. Mixed ANOVAs were conducted to examine the interaction effect of time and intervention condition on

changes in different outcome variables. In each intervention approach, within-subjects ANOVA was further employed to examine the degree of improvements in those outcome variables. Regression analyses were also applied to study the effects of changes in process variables on changes in different outcome variables among participants.

Results

Table 1 provides demographic information about the participants. Across the three conditions, the average age of participant was 13.83 (SD = 1.43) and around 60–70% were boys. More than 75% of participants were Form 2–6 students, and more than 85% were born in Hong Kong. The types of SENs that students had include ADHD (42.4%), ASD (15.2%), dyslexia (33.3%) and intellectual disability (9.1%). Chi-square tests and *t*-tests reflected no demographic differences between the three groups.

Results of mixed ANOVAs revealed no significant interaction effect between the time and intervention groups on any outcome variable, indicating no significant difference in treatment effects across the three intervention groups (Table 2). Results of within-subjects ANOVA also revealed significant improvements in some dimensions within each treatment approach. At post-test, CBT participants reported significant enhancement of positive feelings [$F(1, 46) = 14.685, P < 0.001, \eta^2 = 0.242$] (Table 3). Mindful yoga participants also experienced significant postintervention improvements in a number of dimensions. Significantly, participants reported feeling less stressful [$F(1, 41) = 4.221, P < 0.05, \eta^2 = 0.093$] and experiencing more positive relationship after the intervention [$F(1, 41) = 11.149, P < 0.01, \eta^2 = 0.214$]. Moreover, participants demonstrated a significant reduction in overall behavioural problems [$F(1, 41) = 9.265, P < 0.01, \eta^2 = 0.184$], especially attention problems [$F(1, 41) = 6.703, P < 0.05, \eta^2 = 0.141$] (Table 4). Participants who received positive psychology mainly showed improvements in behavioural problems and positive experience. In post-test, they reported a significant increase in positive feeling [$F(1, 40) = 10.017, P < 0.01, \eta^2 = 0.2$]. Their behavioural problems had also significantly reduced after the intervention [$F(1, 40) = 6.876, P < 0.05, \eta^2 = 0.147$], particularly attention problems [$F(1, 40) = 5.983, P < 0.05, \eta^2 = 0.130$] (Table 5). Thus, Hypotheses 1 and 2 were also partially supported.

As for the psychotherapeutic components in each intervention, changes in negative automatic thoughts significantly predicted a decrease in negative emotions in all three conditions (CBT: $\beta = 0.325, P < 0.05$; mindful yoga: $\beta = 0.713, P < 0.001$; positive psychology: $\beta = 0.688, P < 0.001$; Table 6). For the CBT group, changes in mindful attention and awareness significantly predicted a decrease in behavioural problems ($\beta = -0.663, P < 0.001$). Changes in positive relationship also predicted a decrease in behavioural problems

Table 1: Participants' demographic information by intervention condition

Variables	Intervention condition			<i>t</i> -test/ <i>chi</i> -square test
	CBT (N = 47) n (%)	Mindful yoga (N = 42) n (%)	Positive psychology (N = 41) n (%)	
Age (years)				
10–11	6 (12.8)	3 (7.1)	7 (17.1)	1.910
12–18	38 (80.9)	36 (85.8)	30 (73.2)	
Missing	3 (6.3)	3 (7.1)	4 (9.7)	
Gender				
Boys	34 (72.3)	25 (59.5)	26 (63.4)	1.642
Girls	13 (27.7)	17 (40.5)	14 (34.1)	
Missing	0	0	1 (2.4)	
Grade				
Form 1	10 (21.3)	4 (9.5)	8 (19.5)	2.416
Form 2–6	36 (76.6)	37 (88.1)	33 (80.5)	
Missing	1 (2.1)	1 (2.4)	0	
Birthplace				
Hong Kong	44 (93.6)	37 (88.1)	35 (85.4)	1.824
Mainland China	3 (6.4)	4 (9.5)	2 (4.9)	
Other	0	1 (2.4)	1 (2.4)	
Missing	0	0	3 (7.3)	
Residential district				
Hong Kong Island & Kowloon	5 (10.6)	11 (26.1)	5 (12.2)	6.887
New Territories	39 (83.0)	26 (61.9)	32 (78.0)	
Other	1 (2.1)	1 (2.4)	1 (2.4)	
Missing	2 (4.3)	4 (9.5)	3 (7.3)	
Family income (monthly)				
HK\$14 999 or below	14 (29.8)	14 (33.3)	8 (19.5)	3.869
HK\$15 000–HK\$34 999	17 (36.2)	13 (31.0)	11 (26.8)	
HK\$35 000–HK\$49 999	5 (10.6)	2 (4.8)	5 (12.2)	
HK\$50 000 or above	4 (8.5)	1 (2.4)	2 (4.9)	
Missing	7 (14.9)	12 (28.6)	15 (36.6)	
Psychiatric medicine				
Yes	7 (14.9)	9 (21.4)	7 (17.1)	2.765
No	30 (63.8)	23 (54.8)	28 (68.3)	
Missing	10 (21.2)	10 (21.4)	6 (14.6)	
Type of SENs reported				
ADHD	6 (35.3)	5 (41.7)	3 (75)	7.665
ASD	1 (5.9)	3 (25.0)	1 (25)	
Dyslexia	7 (41.2)	4 (33.3)	0 (0)	
Intellectual disability	3 (17.6)	0 (0)	0 (0)	

Abbreviations: ADHD, attention deficit and hyperactivity disorder; ASD, autism spectrum disorder.

($\beta = -0.297$, $P < 0.05$). Therefore, Hypothesis 3 was partially confirmed. Hypothesis 4 was rejected because changes in mindful attention and awareness among mindful yoga participants did not result in changes in negative emotions, behavioural problems or positive emotions. For positive psychology participants, apart from the changes in negative automatic thoughts, changes in mindful

attention and awareness predicted a decrease in negative emotions ($\beta = 0.560$, $P < 0.001$), but not changes in positive relationship as initially hypothesised. Thus, Hypothesis 5 was rejected. In general, some significant psychotherapeutic factors for positive outcomes (i.e., changes in negative automatic thought and changes in mindful attention and awareness) have been found across

Table 2: Mixed ANOVA results and descriptive statistics for outcome variables by time effect and interaction effect (N = 130)

	Time effect		Interaction effect (time*condition)	
	F-value	η^2	F-value	η^2
Primary outcome variables				
DASS	0.589	0.005	0.855	0.013
Depression	1.494	0.012	1.029	0.016
Anxiety	0.094	0.001	0.686	0.011
Stress	1.263	0.01	0.986	0.015
BPM	8.441**	0.062	2.691	0.041
ATT	8.148**	0.060	1.943	0.030
EXT	1.902	0.015	0.850	0.013
INT	4.910*	0.037	1.866	0.029
SPANE	21.140***	0.143	2.011	0.031
Secondary outcome variables				
CATS	3.684	0.028	0.101	0.002
Physical	0.711	0.006	0.024	0
Social	4.332*	0.033	0.500	0.008
Failure	7.98**	0.059	0.361	0.006
Hostility	0.561	0.004	0.172	0.003
MAAS	0.142	0.001	0.220	0.003
CINSS	10.777**	0.078	1.455	0.022

Abbreviations: ATT, attention problems; BPM, brief problem monitor; CATS, child automatic thoughts scale; CINSS, relatedness subscale of children's intrinsic need satisfaction scale; DASS, depression, anxiety and stress scale; EXT, externalising problems; INT, internalising problems; MAAS, mindful attention and awareness scale; SPANE, scale of positive and negative experience-positive feelings subscale. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

CBT, mindful yoga and positive psychology. Therefore, Hypothesis 6 was supported.

Discussion

Differential treatment effects across the three intervention approaches

Hypotheses 1 and 2 were partially confirmed in that participants in all three interventions reported significant improvements in certain dimensions. Many children and youth with SENs (especially ASD and ADHD) are beset with behavioural problems that adversely impact their school and daily lives (Kuhlthau, Kovacs, Hall, et al., 2013; Loe and Feldman, 2007). Therefore, it is gratifying that the selected interventions appeared to reduce behavioural problems among these school children with SENs.

Surprisingly, none of the interventions exerted a significant reduction in negative emotions in post-intervention, as indicated by DASS. One possible reason is that children and youth with SENs are prone to more severe emotional and mental health problems (Myles, Barnhill, Hagiwara, et al., 2001; Wehmeier, Schacht, and

Table 3: Descriptive statistics and comparison of pre-test and post-test scores in the condition of CBT (N = 47)

	Pretest M (SD)	Post-test M (SD)	Time effect	
			F-value	η^2
Primary outcome variables				
DASS	13.99 (11.72)	13.40 (10.81)	0.246	0.005
Depression	4.87 (4.68)	4.31 (4.36)	1.484	0.031
Anxiety	3.47 (3.40)	3.36 (3.34)	0.067	0.001
Stress	5.62 (4.72)	5.72 (4.08)	0.029	0.001
BPM	11.12 (8.44)	11.27 (8.52)	0.022	0
ATT	4.46 (3.36)	4.40 (3.34)	0.020	0
EXT	3.62 (3.41)	3.71 (3.17)	0.048	0.001
INT	3.04 (3.01)	3.16 (3.23)	0.083	0.002
SPANE	19.75 (5.95)	22.54 (5.15)	14.685***	0.242
Secondary outcome variables				
CATS	35.33 (26.82)	32.01 (24.50)	1.199	0.025
Physical	6.22 (6.72)	5.57 (6.31)	0.603	0.013
Social	10.26 (8.34)	8.72 (7.50)	2.267	0.047
Failure	8.64 (7.70)	7.46 (6.33)	1.583	0.033
Hostility	10.24 (8.60)	10.24 (7.24)	0	0
MAAS	60.36 (16.51)	60.19 (18.92)	0.012	0
CINSS	21.28 (5.45)	22.15 (6.26)	2.384	0.049

Abbreviations: ATT, attention problems; BPM, brief problem monitor; CATS, child automatic thoughts scale; CINSS, relatedness subscale of children's intrinsic need satisfaction scale; DASS, depression, anxiety and stress scale; EXT, externalising problems; INT, internalising problems; MAAS, mindful attention and awareness scale; SPANE, scale of positive and negative experience-positive feelings subscale. *** $P < 0.001$.

Barkley, 2010), requiring more intensive interventions for the psychotherapeutic inputs to take effect. Perhaps, a longer period of intervention using the three approaches may produce greater psychotherapeutic effects that our present 8-session intervention could not do so.

Nonetheless, despite within-group changes in some dimensions of the outcome variables in each of the three intervention conditions, there were no significant between-group differences between the three intervention conditions in the outcome variables. This suggests that no single intervention could provide evidence of an overriding treatment effect for children and youth with SENs. Given the fact that significant improvements in certain outcome indicators were found in within-group analyses in each of the three approaches, it is worthwhile and useful to examine the psychotherapeutic elements and extract the common psychotherapeutic factors that may bring benefits to children and youth with SENs in an integrative manner.

Changing negative automatic thoughts as a common psychotherapeutic element in students with SENs

Our findings confirmed Hypothesis 6 that the importance of changing negative automatic thoughts is highlighted as

Table 4: Descriptive statistics and comparison of pre-test and post-test scores in the condition of Mindful yoga (N = 42)

	Pretest <i>M</i> (SD)	Post-test <i>M</i> (SD)	Time effect	
			<i>F</i> -value	η^2
Primary outcome variables				
DASS	20.60 (13.58)	17.83 (13.24)	2.287	0.053
Depression	6.50 (4.57)	5.35 (4.59)	2.908	0.066
Anxiety	6.35 (4.71)	6.03 (4.43)	0.187	0.005
Stress	7.73 (5.23)	6.44 (4.64)	4.221*	0.093
BPM	12.86 (8.08)	10.66 (9.12)	9.265**	0.184
ATT	4.55 (3.21)	3.74 (3.40)	6.703*	0.141
EXT	3.55 (2.86)	3.04 (3.11)	2.656	0.061
INT	4.76 (3.62)	3.89 (3.61)	3.860	0.086
SPANE	19.60 (4.17)	20.38 (4.00)	1.069	0.025
Secondary outcome variables				
CATS	47.07 (35.83)	43.28 (35.43)	0.926	0.022
Physical	9.75 (9.40)	9.40 (9.08)	0.092	0.002
Social	12.26 (10.21)	11.85 (9.65)	0.232	0.006
Failure	13.07 (11.41)	10.61 (10.08)	3.902	0.087
Hostility	11.99 (9.40)	11.42 (9.58)	0.204	0.005
MAAS	57.71 (15.41)	57.58 (15.97)	0.002	0
CINSS	20.35 (4.76)	22.34 (4.25)	11.149**	0.214

Abbreviations: ATT, attention problems; BPM, brief problem monitor; CATS, child automatic thoughts scale; CINSS, relatedness subscale of children's intrinsic need satisfaction scale; DASS, depression, anxiety and stress scale; EXT, externalising problems; INT, internalising problems; MAAS, mindful attention and awareness scale; SPANE, scale of positive and negative experience-positive feelings subscale. * $P < 0.05$, ** $P < 0.01$.

a common psychotherapeutic element for reducing negative emotions across the three interventions. First, the findings confirmed Hypothesis 3 as changes in negative automatic thoughts predicted changes in negative emotions in the CBT intervention. This is consistent with previous studies ascertaining that CBT strategies can influence individuals' emotions and behaviours by changing their dysfunctional thoughts (Durlak et al., 1991). In the CBT literature, changes in negative thoughts associating with changes in negative emotions are well documented that negative thoughts have been identified as a major psycho-pathological agent mediating the association between life stressors and emotional as well as behavioural problems (Flouri and Panourgia, 2014). Therefore, by gaining awareness of and altering negative automatic thoughts, the severity of negative emotional states as indicated by the three dimensions in DASS was significantly reduced.

What is somewhat astonishing to us are the findings that changes in negative automatic thoughts could also predict a decrease in negative emotions in the student groups using mindful yoga and positive psychology. This may

Table 5: Descriptive statistics and comparison of pre-test and post-test scores in the condition of positive psychology (N = 41)

	Pretest <i>M</i> (SD)	Post-test <i>M</i> (SD)	Time effect	
			<i>F</i> -value	η^2
Primary outcome variables				
DASS	17.35 (11.10)	18.16 (14.27)	0.095	0.002
Depression	5.46 (4.27)	5.72 (5.07)	0.084	0.002
Anxiety	5.07 (3.97)	5.88 (5.20)	0.748	0.018
Stress	6.81 (4.58)	6.58 (5.00)	0.056	0.001
BPM	12.16 (7.15)	9.52 (6.38)	6.876*	0.147
ATT	4.89 (3.11)	3.71 (2.56)	5.983*	0.130
EXT	3.71 (2.62)	3.22 (2.35)	1.702	0.041
INT	3.51 (2.98)	2.59 (2.24)	3.879	0.088
SPANE	19.20 (4.72)	21.58 (4.69)	10.017**	0.2
Secondary outcome variables				
CATS	44.10 (35.66)	38.46 (26.42)	1.530	0.037
Physical	9.03 (9.42)	8.56 (7.47)	0.204	0.005
Social	12.69 (10.25)	10.84 (6.93)	2.182	0.052
Failure	10.90 (10.05)	8.50 (7.87)	2.495	0.059
Hostility	11.50 (8.37)	10.57 (7.44)	0.512	0.013
MAAS	57.67 (14.88)	59.66 (16.40)	0.355	0.009
CINSS	19.41 (4.76)	19.99 (5.85)	0.784	0.019

Abbreviations: ATT, attention problems; BPM, brief problem monitor; CATS, child automatic thoughts scale; CINSS, relatedness subscale of children's intrinsic need satisfaction scale; DASS, depression, anxiety and stress scale; EXT, externalising problems; INT, internalising problems; MAAS, mindful attention and awareness scale; SPANE, scale of positive and negative experience-positive feelings subscale. * $P < 0.05$, ** $P < 0.01$.

be explained by the psychotherapeutic nature of mindful yoga and positive psychology that could somehow influence people's thinking. First, mindful yoga can be regarded as a physical exercise that involves stretching, regulating the muscles and making the spine and joints flexible. Such physical exercises, as in sports exercise, are associated with eliciting positive emotions and gaining a sense of accomplishment (Johnson, 2020). In positive psychology, learning to express positive emotions or relationships might have helped participants reduce their negative thoughts. Green, McGinnity, Meltzer, et al. (2005) suggested that interventions that cultivate positive emotions and thoughts can broaden a person's momentary thought-action repertoires and help enhance the flexibility of their thoughts and actions. The results are not far-fetched. From the viewpoint of reciprocal determinism, changes in one domain in cognition, emotion or behaviour will exert interactive and mutual influence on each other as well as social domains (Critchley, Eccles, and Garfinkel, 2013; Gross, 2002). Thus, it can be deduced that apart from CBT, other psychotherapeutic approaches can exert similar effects on the changes in negative thoughts. Given the findings in this study, negative

Table 6: Results of regression analysis on changes in process variables and outcome variables

	Changes in DASS		Changes in BPM		Changes in SPANE	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
CBT						
Changes in CATS	0.325*	0.096	0.004	0.017	-0.293	0.174
Changes in MAAS	0.194	0.033	-0.663***	0.299	0.032	0.008
Changes in CINSS	0.035	0.001	-0.297*	0.060	0.308	0.065
Mindful yoga						
Changes in CATS	0.713***	0.495	0.279	0.116	-0.038	0.003
Changes in MAAS	-0.007	0.001	-0.185	0.022	0.232	0.081
Changes in CINSS	-0.564	0.004	0.133	0.016	0.241	0.053
Positive psychology						
Changes in CATS	0.688***	0.153	0.141	0.061	-0.228	0.167
Changes in MAAS	0.560***	0.267	-0.202	0.032	0.340	0.096
Changes in CINSS	-0.140	0.018	0.022	0.000	-0.073	0.005

Abbreviations: BPM, brief problem monitor; CATS, child automatic thoughts scale; CINSS, relatedness subscale of children's intrinsic need satisfaction scale; DASS, depression, anxiety and stress scale; MAAS, mindful attention and awareness scale; SPANE, scale of positive and negative experience-positive feelings subscale. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

thoughts can be regarded as a common psychotherapeutic component and any intervention that potentially helps people alter negative thoughts can be incorporated into an integrative psychotherapeutic approach.

Enhancing self-awareness as another common psychotherapeutic factor in psychological and behavioural changes in students with SEN

Another potential common psychotherapeutic factor identified in this study is self-awareness. As revealed in this study, changes in mindful attention and awareness in CBT and positive psychology interventions exerted some psychotherapeutic effects in specific psychological and behavioural dimensions among students with SENs. These findings are consistent with previous literature suggesting that CBT intervention pays attention to self-awareness of one's inner states, including emotional, cognitive, physiological and behavioural responses to external stressors, and to identify the dysfunctional pattern of these inner responses. Once this awareness is achieved, the individual can then learn various cognitive and behavioural strategies to untangle their dysfunctional pattern of responses (Buchalter, 2014).

However, somewhat to our surprise, our finding in the positive psychology intervention revealed that the improvement in mindful attention and awareness, but not positive relationship, was associated with the decrease in negative emotions. Hypothesis 5 was thus rejected. One way of explaining this finding is that many of the exercises in positive psychology are by nature reflective and do require a person to have a good sense of self-awareness of his/her inner states. For example, by expressing gratitude, an individual must engage in self-introspection of one's attitude towards the

good deeds of others and to examine one's ways of appropriately and inappropriately expressing an act of gratitude. Indeed, as Herwig, Kaffenberger, Jäncke, et al. (2010) asserted, the awareness of a stream of internal and external processes preceding behavioural impulses and responses is fundamental to coping with negative emotions and behavioural problems. Thus, irrespective of any approach to be used, psychotherapeutic changes in an individual may require a level of introspective self-awareness to be achieved by such individual. This highlights the importance of developing introspective self-awareness in changing emotions and behaviours in people, including youth with SENs.

On the contrary, Hypothesis 4 was rejected as mindful yoga did not lead to positive changes in any of the dimensions of mindful attention and awareness. This is a very surprising result as the key psychotherapeutic element of mindful yoga (i.e., enhancing mindful attention and awareness) has no association with any change in primary outcomes. This unexpected finding may be related to the participants' cognitive development. As a strategy to enhance self-awareness, mindful yoga requires the individual to acquire such awareness through a self-experiential process, which may be difficult for some youth to achieve on their own. As Goodman, Madni, and Semple (2017) pointed out that children's and adolescents' metacognitive skills are still developing, and they may not be able to apply high level of metacognitive awareness to engage fully in the observation of their own very subtle bodily sensations, thoughts and emotions during a self-regulated mindful exercise (Gogtay, Giedd, Lusk, et al., 2004). On the contrary, in CBT and positive psychology approaches, there are outwardly oriented practical exercises that are easily understood and

performed. Despite the difficulty in achieving a greater level of mindful awareness through mindful yoga in this study, self-awareness appears to be an important psychotherapeutic element that needs to be incorporated into an integrative psychotherapeutic approach for changing negative emotions and behaviours in students with SENs.

Increasing collaborative activities to enhance positive relationship in students with SENs

This study found a significant improvement in positive relationship only in mindful yoga intervention. This was a pleasant surprise to the researchers, as many of us would wonder how mindful yoga could facilitate positive relationships and social connectedness with other people. The answer could be found in the treatment protocol that included collaborative activities during the mindful yoga sessions ('Befriending and Compassion Practice'). Unlike normal mindfulness or mindful yoga exercises, this mindful yoga for youth version required group members to engage in collaborative exercises to employ conflict resolution and develop mutually agreed strategies to perform certain difficult joint stretching, moving or holding a position exercises. Through such joint efforts, the participants could actually build positive relationships with their peers. Interestingly, in the CBT and positive psychology interventions, through sharing of negative and successful experiences in managing negative emotions and building positive emotions, group members could build positive relationship with one another. Underlying these collaborative activities is the psychotherapeutic element of cooperation and comradeship that are being fostered through the group activities. In youth, collaborative activities can enable participants to employ conflict resolution and self-regulation strategies to build positive relationships with others (Hromek and Roffey, 2009). Given this observation, collaborative activity as a common psychotherapeutic factor can be incorporated into the design of an integrative psychotherapeutic approach for students with SENs.

Implications

Theoretical level

This study highlights several positive psychotherapeutic elements, including dealing with negative thoughts, enhancing self-awareness and increasing collaborative activities, which may be associated with positive emotional and behavioural outcomes for students with SENs in Hong Kong. Given these preliminary findings, there is a need to further explore the underlying mechanisms of how these psychotherapeutic elements have helped to improve students' mental well-being. Such an exercise will lead to the development of an integrative psychotherapeutic approach involving a collaborative, self-reflective and activity-based intervention targeting the cognitive and behavioural changes in youth with SENs. As suggested by Shattuck and Grosse (2007), there is little specificity to define which intervention is the most optimal for

different groups of children with autism and other developmental disabilities. An integrative and comprehensive approach involving different treatment components may yield better effects for clients, including youth with SENs.

Practice level

This study has several practical implications for working with youth with SENs. As mentioned, an integrative psychotherapeutic approach incorporating significant elements identified in this study could be adopted in treating students with SENs. First, it would be useful to include strategies to help this group of youth to be aware of their negative response patterns, including negative automatic thoughts, and to develop strategies to address these thoughts. Second, experiential and collaborative exercises could be designed to increase youth's self-awareness and relationship building with others. These activities would be useful to enhance individual achievements and interpersonal relationship skills.

Limitations

Despite some preliminary positive results, this study has several critical limitations. First, this intervention study can only help us distinguish specific psychotherapeutic components from one or a few interventions to tackle their behavioural and emotional problems, as there are no sufficient data to explore any specific intervention for a particular type of SEN condition. Second, this study is a pilot one without a control condition, and the robustness of this study can be further improved by introducing a randomised control design to minimise any selection bias. Third, measurements in this study were based on students' self-reported assessment. Ideally, ratings of teachers or parents, behavioural assessment and biomarkers can be collected for broader and more objective measurement. Moreover, possible variations in the implementation of the interventions could be found in different participating schools and these were difficult to control. Some schools launched the programme across two school terms that could have negatively influenced the flow of the intervention programmes. To minimise these differences, three standardised protocols for the three approaches had been developed at the outset for the implementation of these programmes.

Conclusion

This study explored the psychotherapeutic effects of CBT, mindful yoga and positive psychology interventions and identified significant psychotherapeutic elements for formulating an integrative psychotherapeutic approach to enhance the well-being of students with SENs. In addition to the unique treatment effects found within each intervention, several common psychotherapeutic elements were highlighted, which may illuminate the directions for developing an integrative psychotherapeutic framework. This includes dealing with negative thoughts, enhancing self-awareness and increasing collaborative activities

among students with SENs in Hong Kong. However, our findings are preliminary, and future studies should explore and verify these common psychotherapeutic elements in the well-being of youth with SENs and their underlying mechanisms.

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Conflict of interest

The authors declared that there is no conflict of interest in this study.

Data availability statement

The authors confirmed that the data supporting the findings of this study are available upon reasonable request.

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Appendix A: Cognitive behavioural intervention programme

Session	Goals	Content
1. Introduction	<ul style="list-style-type: none"> Understanding the relationship between thoughts, emotions and behaviours 	<ul style="list-style-type: none"> Getting connected and committed What is emotion? How do negative emotions come about? – A CBT framework Why do we need to manage our negative emotions? Homework
2. Awareness of our response patterns	<ul style="list-style-type: none"> Learning to recognise one's emotional and physiological responses to perceived negative events Learning to recognise one's own thought patterns – the thought traps Learning to recognise one's adaptive and maladaptive behavioural responses 	<ul style="list-style-type: none"> Review homework Learning to recognise our dysfunctional responses lead to negative emotions – case studies Understanding how our dysfunctional patterns get reinforced – drawing the dysfunctional cycle Homework
3. Catching one's negative automatic thoughts (NATs)	<ul style="list-style-type: none"> Recognising own thought traps and maladaptive behaviours 	<ul style="list-style-type: none"> Review homework Practising ways of recognising own's NATs Differentiating adaptive and maladaptive coping behaviours Homework
4. Developing the 5-strategies for managing emotions	<ul style="list-style-type: none"> Understanding and using the 5-strategies 	<ul style="list-style-type: none"> Review homework Teaching the 5-strategies: a step by step approach Applying the strategies to individual participants Homework
5. Using the 5-strategies on managing impulsivity	<ul style="list-style-type: none"> Understanding and using the 5-strategies for managing impulsive behaviours Understanding and using the 5-strategies for managing anxieties 	<ul style="list-style-type: none"> Review homework – telling success stories Applying the strategies to handling impulsive behaviours Homework Review homework – telling success stories Applying the strategies to handling anxieties Homework
6. Using the 5-strategies on managing anxieties		
7. Using the 5-strategies on managing anger	<ul style="list-style-type: none"> Understanding and using the 5-strategies for managing anger 	<ul style="list-style-type: none"> Review homework – telling success stories Applying the strategies to handling anger Homework
8. Celebration	<ul style="list-style-type: none"> Reviewing strengths and gains Celebrating successes 	<ul style="list-style-type: none"> Reviewing strengths and gains Celebrating successes Granting certificate

Appendix B: Protocol of mindful yoga programme

Session	Content
Session 1	<i>Exploring sensations with curiosity</i> Sensory awareness exercises, mindful eating (raisin) exercises, breathing meditation
Session 2	<i>Exploring the body</i> Breathing meditation, body awareness exercises, body scan, yoga exercises
Session 3	<i>Recognising pleasant feelings</i> Recognising pleasant feelings and thoughts at the moment, Hatha Yoga (crawling on the back, on belly or sideways)
Session 4	<i>Awareness of distraction</i> Breathing meditation, distraction awareness exercises, body scan, yoga exercises
Session 5	<i>Automatic responding and stress response</i> Breathing meditation, breathing space, awareness of automatic responding exercises, body scan, yoga exercises
Session 6	<i>Recognising unpleasant feelings</i> Observing negative emotions (anxiety, sadness and anger) and thoughts Yoga practices (standing, sitting and lying position)
Session 7	<i>Befriending and compassion practice</i> Use of partner yoga to promote interpersonal empathy and sensitivity
Session 8	<i>On your own</i> Consolidate the learning and design action plans to handle daily stressors

Appendix C: Protocol of positive psychology intervention programme

Session	Goals	Content
1. Introduction	<ul style="list-style-type: none"> To introduce the concepts of happiness and well-being To introduce positive emotions, enhance positive relationship and build up sense of accomplishment 	<ul style="list-style-type: none"> Mutual introduction Understanding happiness and well-being Brief introduction of emotions, relationships, and accomplishment
2. Positive accomplishment: goal setting and agency enhancement	<ul style="list-style-type: none"> To identify own character strengths and set goals To increase the motivation for goal achievement 	<ul style="list-style-type: none"> Understanding the concept of ‘character strengths’ and identifying own signature strengths Identifying goals in school, family, and peer relationship Increasing motivation for goal attainment (agency enhancement) by self-appreciation and encouragement
3. Positive accomplishment: pathway formulation	<ul style="list-style-type: none"> To formulate different pathways and overcome possible constraints and obstacles to achieve goals 	<ul style="list-style-type: none"> Brainstorming different pathways for goal attainment Solving problems to overcome obstacles and constraints for goal attainment
4. Different forms of positive emotions	<ul style="list-style-type: none"> To introduce and experience different forms of positive emotions 	<ul style="list-style-type: none"> Experiencing positive emotions by savouring positive events in the past and the present
5. Positive emotion: gratitude	<ul style="list-style-type: none"> To introduce the ‘four steps of gratitude’ To brainstorm different ways to express gratitude To experience self-compassion and express gratitude to others 	<ul style="list-style-type: none"> Understanding ‘four steps of gratitude’ Experiencing self-compassion and expressing gratitude to others
6. Positive Relationship: love	<ul style="list-style-type: none"> To introduce the five languages of love To enhance relationship with others through expressing and experiencing love 	<ul style="list-style-type: none"> Understanding the five languages of love Expressing and experiencing love through different languages
7. Positive relationship: empathy	<ul style="list-style-type: none"> To introduce the concept of empathy To understand other people and show empathy to them 	<ul style="list-style-type: none"> Understanding empathy Understanding others’ perspectives, feelings and thinking, and showing empathy to them
8. Integration and consolidation	<ul style="list-style-type: none"> To integrate and consolidate previous learning To apply what has been learned in the future To have mutual feedback on the growth and development of the members 	<ul style="list-style-type: none"> Reviewing and integrating previous learning Discussing possible ways of applying the learning in the future Mutual sharing and feedback