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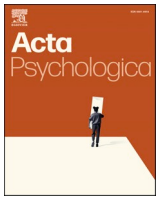

Creating a resilient pedagogy: Character strengths intervention for aspiring educators

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ABSTRACT

Teachers play a crucial role in guiding learners through life's challenges. They face educational and socio-economic shifts while striving to teach for a better future. Our study focuses on equipping future teachers, called pre-service teachers, with resilience-building resources during their teacher training program. A potential antecedent to resilience, which facilitates cognitive strategies and attentional processes, is cognitive flexibility. We first tested whether cognitive flexibility predicts resilience. Next, relying on the tenets of positive psychology, which studies resilience, we developed and tested the effectiveness of character strengths intervention in enhancing pre-service teachers' resilience and cognitive flexibility. An individual's belief in their ability to change personal resources could influence how an intervention manifests. Hence, we studied how mindset impacts the intervention's effect on cognitive flexibility and, thus, resilience. We adopted a multi-method approach, guided by Polk's theory of resilience, to test out objectives.

Using a cross-sectional design, study one (n = 273) found that cognitive flexibility significantly predicted resilience. Study two (N = 193; n_{exp} = 133, n_{cont} = 60) was a multi-site field experiment. We found that intervention significantly enhanced resilience (experimental group M = 29.62, control group M = 28.33) and cognitive flexibility (experimental group M = 54.42, control group M = 52.01). Further, a growth mindset, was found to moderate the indirect effect of character strengths intervention on resilience via cognitive flexibility. The study contributes to theoretical and practical advancements in resilience. Taken together, the findings highlight the cognitive-affective-behavioural makeup of resilience and, importantly, the role of cognitive flexibility. The intervention can be seamlessly integrated into teacher training curricula for a resilient future.

1. Introduction

Teaching is crucial in society and a foundational pillar for various professions. However, challenges such as limited resources, increased job demands, role ambiguity, and relatively lower salaries characterise teaching as a high-stress occupation. These factors contribute to significant issues like teacher burnout and attrition (Aggarwal, 2012; García-Carmona et al., 2019; Gillet et al., 2022; Núñez-Regueiro et al., 2024; Shukla & Trivedi, 2008). It is evident that teaching requires continuous resource utilisation to adapt effectively to diverse situations while interacting with students, parents, colleagues, and employers (Madigan & Kim, 2021).

Recent research has shifted focus to studying individuals who manage stress effectively, emphasising "what is going right" with these individuals rather than "what is going wrong" with those unable to handle it well (Howard & Johnson, 2004). This perspective aligns with positive psychology (PP), which explores resilience and the factors that influence it (Cheng, 2024; Hoferichter & Jentsch, 2024; Tugade & Fredrickson, 2004). Resilience is conceptualised as a process that involves a positive transformation of the individual, where they develop and strengthen their abilities. This propels them toward the future with increased self-confidence to confront new challenges (Moll Riquelme et al., 2022; Rutter, 1987). While research into teacher stress and resilience is expanding, a notable gap remains at the teacher education level (Gu & Day, 2013). This led us to adopt the framework of primary interventions, emphasising equipping individuals with skills to manage stressors before they escalate (Parkes & Sparkes, 1998).

Teacher education is a critical opportunity to equip pre-service teachers (PSTs) with the necessary tools to enhance their adaptive functioning in future classrooms (Birchinall et al., 2019; O'Brien et al., 2020). PSTs are higher-education students pursuing specialised degrees to qualify as teaching professionals (Erdem et al., 2019). PSTs face

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unique challenges, including a demanding academic curriculum, practical courses, teaching internships, and high perceived demands, in addition to general student stressors (Chaplain, 2008; García-Martínez et al., 2021; Geng et al., 2015; National Council for Teacher Education, 2009). Mental health issues, particularly stress among PSTs, often go unaddressed, viewed as a typical aspect of teacher development and accepted as inherent to the profession (Birchinall et al., 2019; Gupta & Panshikar, 2023).

Understanding why some PSTs handle stress better than others is essential because this is necessary to their success in teaching. Although the focus on teacher stress and resilience is growing, studies explicitly focusing on PSTs are still emerging (Bertieaux et al., 2024; Birchinall et al., 2019; Hoferichter & Jentsch, 2024; Yada et al., 2021; Zhang & Luo, 2023). Given these observations, we posit that resilience is an indispensable capacity that PSTs must develop to thrive in their current and future roles. This paper investigates the antecedents of resilience and develops and tests an intervention to aid PSTs' resilience-building.

1.1. Resilience

Resilience is a "dynamic process and outcome of positive adaptation in the face of adversity, enabled by an individual's personal qualities" (Connor & Davidson, 2003; Luthar & Cicchetti, 2000; Masten et al., 1990). The definition emphasises two critical components: adversity and positive adaptation. Adversity encompasses any hardship or suffering encountered in daily life, ranging from difficulties to significant stressors (Epel et al., 2018; Holmes & Rahe, 1967). It acknowledges the subjective nature of adversity, recognising variations in intensity, severity, and context (Vanhove et al., 2016). Positive adaptation refers to maintaining or restoring mental well-being despite adversity (Masten & Obradovic, 2006). The definition also highlights its dynamic nature, which is susceptible to change and development (Ferreira et al., 2021).

In the context of PSTs, understanding resilience is particularly important as they navigate the challenges of their training and careers. The nature of the training is such that they encounter similar challenges to in-service teachers, such as managing students and classroom behaviour and meeting the curriculum requirements, which could make them perceive teaching as stressful (Chaplain, 2008; Gu & Day, 2013; Jennings et al., 2013). Equipping PSTs with strategies for resilience-building early in their training can be beneficial (Le Cornu, 2009).

Research in education advocates for adopting positive psychological principles, particularly a strengths-based perspective and positive education (PE), as viable and significant predictors of well-being and optimal functioning (Huebner et al., 2009; Noble & McGrath, 2015). The PE paradigm amalgamates "traditional education with approaches that nurture well-being and promote good mental health" (Seligman, 2011). This paper focuses on PSTs, regarded as students within the broader educational training framework, and anticipates the future scenario wherein these PSTs will engage in classrooms to enrich the learning experience. Our endeavours are in line with the PE paradigm. To investigate this further, we position our study within the framework of PP, which emphasises individual differences and personal qualities, i.e., character strengths, that enable PSTs to navigate challenges effectively.

1.2. Character strengths

Character strengths (CSs) play a significant role in fostering resilience in PSTs by providing the individual qualities required for positive adaptation in the face of challenges. CSs, defined as individual differences in universally valued "positive traits reflected in thoughts, feelings, and behaviours" (Park et al., 2004), encompass a range of attributes that can help PSTs navigate the unique stressors they encounter during their training and careers. Peterson and Seligman (2004) delineated 24 character strengths broadly categorised under the six virtues. These virtues are integral to the PSTs' values for education and practice, including love and kindness (peace), fairness, and leadership (equality):

1. Wisdom and Knowledge: Creativity, curiosity, judgement, love of learning, perspective.
2. Courage: Bravery, perseverance, honesty, zest.
3. Humanity: Love, kindness, social intelligence.
4. Justice: Teamwork, fairness, leadership.
5. Temperance: Forgiveness, humility, prudence, self-regulation.
6. Transcendence: Appreciation of beauty, gratitude, hope, humour, spirituality.

Research indicates that resilience is closely linked to specific CSs. For example, humour can buffer the adverse effects of hassles on well-being (Padhy et al., 2024). Other strengths, such as zest, hope, self-regulation, curiosity, and gratitude, were associated with healthy lifestyle and self-care activities, like exercise and reduced alcohol consumption, suggesting adaptive behaviours (Weziak-Bialowolska et al., 2023). CSs were also linked to a reduced risk of depression (Weziak-Bialowolska et al., 2021). Additionally, honesty, humour, kindness, and fairness were important for building supportive relationships (Wagner, 2019), all essential for managing stress and maintaining well-being.

Providing PSTs with skills to enhance their CSs improves coping mechanisms and contributes to a more supportive learning environment. We prioritise CSs over other personality frameworks for two main reasons. Firstly, unlike traditional approaches that see strengths as fixed traits, the CSs conceptualisation acknowledges their trait-like nature but emphasises their potential for change, influenced by context and environment. Secondly, CSs comprehensively understand an individual's positive attributes, going beyond conventional personality traits, talents, and skills. This broader perspective has been applied in various fields (Biswas-Diener et al., 2011; Niemiec, 2018), making it valuable for educational research.

2. Literature review

2.1. Theoretical framework

Polk's theory of Resilience (1997) identifies four resilience patterns derived from existing research on individual resilience. Understanding the tenets provides a foundation for comprehending our study. First, the dispositional pattern focuses on physical aspects of resilience, including personal attributes such as personality characteristics and health. This pattern also encompasses psychosocial aspects such as self-esteem and autonomy. Second, the relational pattern involves relationship-related roles and attributes. This includes having positive role models, seeking comfort in others and engaging in positive social interactions. Additionally, having a supportive work environment is considered part of this cluster.

Third, the situational pattern emphasises understanding the context and utilising cognitive appraisal skills for problem-solving. This pattern underscores the ability to perceive changes in situations and adapt accordingly. Attributes associated with this pattern include flexibility, curiosity, inquisitiveness, and perseverance. Fourth, the philosophical pattern revolves around personal beliefs, hope for the future, self-reflection, and finding meaning in evolving circumstances. This cluster emphasises understanding the uniqueness of goals, being open to personal development, and believing in the greater good.

Polk underscored that these clusters, characterised by their attributes, continually interact within chaos (stress) and order cycles. When these clusters effectively synergise, they contribute to an individual's resilience. A vital aspect of this theory is the recognition that external facilitation can amplify the synergy among these clusters, a concept particularly pertinent to this study involving intervention.

2.2. Strengthening resilience: character strengths intervention

Numerous strategies and action plans have been developed, tested, and implemented to address stress and improve resilience among employees and teachers (Agyapong et al., 2023; Avey et al., 2023; von der Embse et al., 2019). However, the importance of the adage "prevention is better than cure" resonates strongly with us. This underscores the significance of promoting a healthy lifestyle and preventing illness as essential components of a fulfilling life. This viewpoint is a central principle of preventive interventions (Kelloway et al., 2008), which aim to enhance positive aspects of the work environment rather than mitigate harmful factors alone that affect optimal functioning.

The underlying idea is that interventions aimed at nurturing and developing positive aspects in the workplace could play a compensatory role, effectively reducing the effects of adverse conditions in the work environment, as outlined by primary interventions (Parkes & Sparkes, 1998). Drawing from both perspectives, we are motivated to strengthen PSTs as they prepare to enter the workforce as educators. We aim to assist them in building psychosocial skills, thus preparing them to navigate and shape the future of the workplace.

Literature highlights the application of CSs to reap positive workplace benefits such as work engagement and work performance (Littman-Ovadia et al., 2017; Schutte & Malouff, 2019; Tobias et al., 2023). The universal, positive, and developmental nature of CSs allows individuals to comprehend, utilise, and manifest these strengths, promoting adaptive outcomes. Specifically, strengths such as judgement, kindness, teamwork, and creativity were shown to protect against suicidality and depressive moods in employees (Kim et al., 2018), which could enable individuals to cope adaptively.

Although research on the relationship between CSs and resilience is narrow, certain studies suggest their significant impact on resilience-related factors (Martínez-Martí & Ruch, 2017). For example, using neural imaging techniques, a study suggests that resilience and creativity (a character strength) are connected (Sun et al., 2024). Improving one's creative potential can enhance resilience as one explores diverse solutions and ways to approach the stressors rather than feeling constrained. In another study, CSs such as zest, hope, kindness and gratitude were associated with adaptive functioning and resilience (Haridas et al., 2017). Resilience was found to counter the effects of adversity factors, such as chronic stressors, on peace of mind, which can be considered as a transcendence virtue (Hsieh et al., 2024).

Studies specifically focusing on interventions using CSs alone to enhance resilience in adults are limited. Research has explored interventions targeting strengths with related outcomes such as life satisfaction, workplace well-being, and resilience (Behrendt et al., 2023; Dubreuil et al., 2016). Additionally, various studies have employed multi-component positive psychological interventions and strengths-based cognitive behavioural therapy to bolster work engagement, well-being, and resilience (Abbott et al., 2009; Padesky & Mooney, 2012; van Agteren et al., 2021). These studies collectively indicate the efficacy of positive psychological interventions and suggest that interventions focusing solely on CSs can yield significant outcomes.

The literature outlines multiple behavioural and cognitive strategies to build resilience, potentially causing changes in the brain networks for sustained impact (Tabibnia & Radecki, 2018). We have incorporated these strategies into our intervention in several ways. Owing to the practical experience that the training imparts to PSTs, strategies such as stress inoculation (exposure to and dealing with manageable stress) and active coping (relying on self-efficacy, autonomy and reorienting perspectives) are encouraged in the current intervention. Behavioural strategies include adopting healthy habits that boost physical health and securing social connections. Cognitive strategies include emotional regulation through expression and affect labelling. CSI could elicit a mixture of these strategies. For example, when taught optimally, the CSs of self-control, bravery, social intelligence, prudence, and gratitude could ensure adherence to a resilience-building trajectory.

We propose including CSI as an antecedent of resilience by mapping it to the clusters described in Polk's theory. CSI can be primarily placed into the dispositional and situational clusters representing personality dynamics, which CSs are, and upon which individuals rely to interact with the self and environment. More broadly, Niemiec (2018) proposes the centrality of strengths to the individual's behaviours. For example, CSs, such as teamwork, kindness, justice, and kindness, could form the basis of social interactions, an aspect discussed in the relational cluster. The transcendence virtue, which includes strengths such as hope, spirituality, and gratitude, directs us to consider its contribution to the philosophical cluster as it strongly encapsulates these strengths. Literature suggests that becoming aware of CSs alone could lead to positive outcomes (Dolev-Amit et al., 2021). Research also indicates that people experience greater well-being when actively living out their values rather than just agreeing with them (Bojanowska et al., 2022). Integrating these, we postulate that,

H1. Character strengths intervention will increase PSTs' resilience more than character strengths awareness alone.

2.3. Strengths-flexibility nexus: raising resilience

The definition of resilience highlights that what it is and how it is experienced can only be comprehended when responding to adversity. An event or a situation is assessed as adversity based on one's cognitive faculties, i.e., perception and appraisal of resources and the event's intensity. Therefore, cognitive evaluations play a significant role in the trajectory of resilience by modulating how stressors are perceived, aiding in self- and emotional regulation and effective problem-solving (Hofmann et al., 2012; Isen, 2008; Ma & Liu, 2024; Ram et al., 2019; Yao & Hsieh, 2019). Thus, it is indispensable to consider the cognitive aspects that potentially explain PSTs' resilience. An antecedent to flexibility, a desired outcome of psychological interventions, is Cognitive Flexibility (CF).

CF is an essential aspect of resilience as it plays a significant role in adapting to changing environments. It is defined as "being aware of available options and alternatives in any given situation, being flexible and adaptable, and having self-efficacy in being flexible" (Martin & Rubin, 1995). CF is a complex construct that encompasses cognitive and behavioural aspects. The cognitive component pertains to the mental capacity to transition between different thought patterns or strategies as situational demands change. This includes modifying one's thinking to integrate new information or perspectives (Ionescu, 2012; Scott, 1962). The behavioural aspect of CF pertains to the capacity or self-efficacy to alter one's actions and behaviours flexibly to meet the changing requirements of the environment. This adaptability can act as a prerequisite that allows individuals to modify their behaviours and responses based on contextual cues and dynamic circumstances (Brown & Tait, 2014; Ionescu, 2012; Uddin, 2021). The interaction between these cognitive and behavioural components enables individuals to navigate complex and ever-changing environments effectively (Hohl & Dolcos, 2024).

Due to the varied conceptualisations of CF, diverse assessment methods are employed, including neuropsychological tasks, neuroscientific approaches such as neuroimaging, and self-report questionnaires. The decision to employ self-report or other measures relies on the conceptualisation of CF and the chosen methodology. We opted for a self-report approach in this study, which is commonly used in interventional research (Dang et al., 2020; Hohl & Dolcos, 2024). This method focuses on an individual's awareness and application of their CF abilities rather than task-based performance. Questionnaires like the one used in our study capture self-assessment across various situations and thought processes—cognitive and behavioural flexibility in everyday situations. This allows for recording the effect of the intervention and how this might have improved in terms of their confidence and ability to employ CF strategies, such as shifting perspectives and behaviours and the

willingness to act on them (Martin & Rubin, 1995).

In general, task-based neurocognitive measures have been characterised as "reductionist" as they assess only the task in focus and typically measure optimal performance. On the other hand, self-report measures provide a cumulative evaluation of typical behaviour, capturing broader aspects of CF (Wennerhold & Friese, 2020; Whiting et al., 2017). Self-report questionnaires are said to be more reliable than neurocognitive measures (Dang et al., 2020; Howlett et al., 2023). Further, a self-report questionnaire is suggested to be an effective approach to capture CF and measure the change when used in the interventional setting (Friedman & Gustavson, 2022; Grant & Cassidy, 2022; Toplak et al., 2013). Therefore, we employed a questionnaire to measure CF.

CF has been associated with creativity, problem-solving, multitasking, and decision-making. For PSTs, CF could be crucial as they need to continuously interact and regulate these interactions with students of various socio-cultural backgrounds while also being involved in quick decision-making with situations arising in classrooms (Stein et al., 2018). The shift in teaching methods and procedures necessitates PSTs to change their teaching patterns and adapt to the evolving curriculum requirements (Stein et al., 2018), which could be stressful. In such instances, CF may help them inhibit automatic responses that may be unprofessional or maladaptive (Harel et al., 2023; Zhou et al., 2020). One of the cognitive strategies to build resilience includes cognitive reappraisal, referring to reframing and reorienting oneself in the event of a stressful situation (Tabibnia & Radecki, 2018; Webb et al., 2012). CF can help individuals cognitively evaluate and correct the course of action in the face of difficulties (Odacı & Cikrikci, 2019). The strategies mentioned in these sections work by altering the connection between the hypothalamic-pituitary-adrenal (HPA) axis, responsible for releasing cortisol and the medial prefrontal cortex (MPFC), responsible for controlled processes, such as self-control (Eisenberger & Cole, 2012).

CF can be developed through interventions. These approaches include multiple options, such as cognitive, physical, and specialised curriculum programs and general interventions to enhance cognitive skills (Ángel Latorre-Román et al., 2021; Karbach & Unger, 2014). PP interventions are thought to work by cognitively changing and shifting the attention to cause positive information processing. This cognitive change in focusing on positive aspects and reappraising the situation could lead to positive emotions (Quoidbach et al., 2015; Wellenzohn et al., 2016), further looping in the stress-resilience relationship. CF is a crucial factor in determining why some PSTs can adapt to stressors while others struggle, making it essential to understanding resilience, particularly in stressful situations (Kunicki & Harlow, 2020). Our intervention takes a general approach to improve the overall cognitive-behavioural processes of PSTs, thus influencing CF.

CF encompasses two interrelated processes: accepting experiences and engaging in actions aligned with one's values (Daneshvar et al., 2022). Consequently, individuals with CF can deal with the circumstances rather than avoid them all within the individual value system (Hayes et al., 2006). CSI enables PSTs to use their value-oriented CSs, such as prudence, perspective, or self-regulation, which can aid in shifting coping strategies based on the nature of stressors. This acts as a protective factor and can reorient and decrease any adverse effects of stress (Cheng et al., 2014; Galatzer-Levy et al., 2012; Kato, 2012). CSs allow for a more controlled and informed response in the face of stressors, with the potential for changes in the HPA-MPFC connection. This happen through various learned behaviours, such as adopting a healthy lifestyle by exercising judgement, and being curious and persistent about such a lifestyle. Cognitive strategies, such as problem-solving, emotional regulation, and reappraisal, through wisdom, strengths such as kindness, forgiveness when mistakes are made, and hope. A combination of these could affect the gut health and physiological response patterns to stress, such as heart rate or sleep (Kinlein & Karatsoreos, 2020; Nicolson et al., 2020; Şenocak & Demirkıran, 2023; Uddin, 2021). CF, as explained by Polk's theory's dispositional and situational clusters, translates personal resources into cognitive behavioural strategies to deal with demands and stressors. Summarily, we hypothesised that,

H2. Cognitive flexibility is positively associated with resilience.

H3. Character strengths intervention will increase PSTs' cognitive flexibility more than character strengths awareness alone.

2.4. Belief in the possibility: mindset

Literature suggests that personal attributes and internal resources can change (Brandstätter & Bernecker, 2022; Yeager & Dweck, 2020). For change to occur, individuals need to believe their attributes, like CSs, CF, and resilience, can be developed. A growth mindset (GM) is the belief that attributes like personality or intelligence and abilities can improve with effort, while a fixed mindset (FM) is the belief that these are innate and unchangeable (Dweck, 2013). Mindset is crucial in Polk's theory of dispositional pattern, encompassing attributes, actions, and beliefs in malleability (Polk, 1997). As a result, mindset affects several outcomes, including significant life events (Schroder et al., 2017).

This study considers mindset as a "metacognitive belief" about the change and growth of personal resources like CSs (Zhao et al., 2021). It influences perspectives and attributions, affecting motivation and behaviour (Dweck, 2017). An FM limits the potential to handle stress by promoting dysfunctional thinking, acting as a cognitive vulnerability to negative outcomes of stress (Beck, 2002). In contrast, individuals with a GM use strategies to shift from helpless to helpful and make efforts to change their responses and actions (Robins & Pals, 2002). A GM allows individuals to perceive and use opportunities for self-development, which can help in creating alternative strategies (Heslin & Vande-Walle, 2008). Therefore, mindset is crucial in how CSs are perceived and utilised (Dweck, 2013).

Cognitive control processes in the frontoparietal network are crucial for regulating thoughts and behaviours to resolve conflicts, which is essential for resilience (Yao et al., 2024). Research shows that a GM can improve cognitive gains like working memory and cognitive control in adults (Sheffler et al., 2023). Cognitive control is strengthened as individuals categorise and correct errors in processing information (Molden et al., 2006; Moser et al., 2011). This cognitive control helps make focused decisions, filter out information, and assess the best outcomes in evolving situations (Verhaeghen, 2012).

Mindset plays a key role in how CSI is perceived and acted upon. For instance, self-regulation helps manage and change strategies in response to stressors, reorienting one's perspective and influencing CF. A GM likely promotes openness to change and strengthens active engagement and perspective shifts. Though not a direct relationship, a study found that individuals with a holistic thinking style, characterised by openness to contradictions and a flexible mindset, tend to be more resilient than those with an analytical thinking style (Yao et al., 2024). Wisdom, for example, could enhance resilience through CF, and one's mindset, specifically GM, might influence this relationship between CSI and CF. Although no empirical work has tested this before, the available literature directs us to hypothesise that,

H4. The increased cognitive flexibility would mediate the relationship between character strengths intervention and resilience in PSTs with a growth mindset.

2.5. Current study

This study is positioned within a cognitive-affective-behavioural framework, recognising the scarcity of research on the influence of CSI on PSTs' resilience. It also acknowledges the need for further investigation into the factors contributing to resilience. We employed a multi-method approach across two studies to address these gaps and test our hypotheses (Fig. 1). In study one, a correlational study, and we first

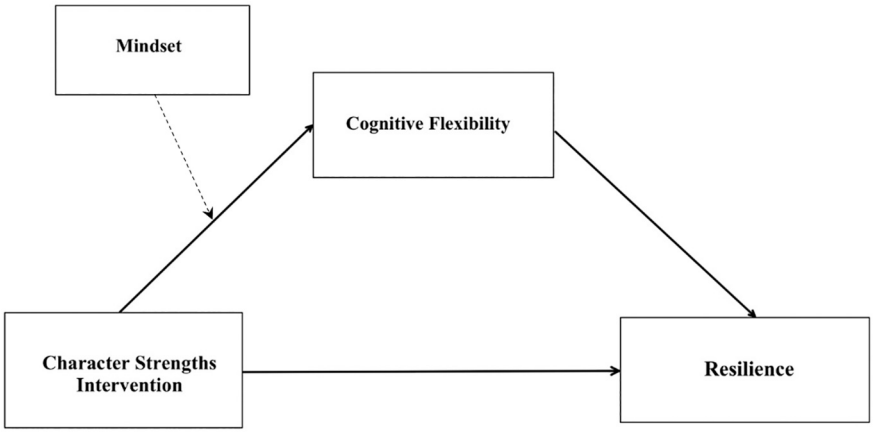

Fig. 1. Conceptual model.
Note. The dashed arrow represents the hypothesised moderated mediation effect.

tested hypothesis H2, that CF predicts resilience. Study two tested H1, H3, and H4 through a field experiment. Both studies were approved by the Institutional Ethics Committee (IEC/2022–03/VV/01/04).

3. Study one

3.1. Method

3.1.1. Participants

A questionnaire was created using Google Forms. Participants were 19–52 years old ($n = 273$; $M_{age} = 25.63$ years, $SD = 5.18$; women = 72.9 %). The inclusion criteria were that educators, including pre-service teachers, teaching assistants, and full-time teachers over 18 years of age, belonging to any educational setting, could participate in the study.

3.1.2. Measures

3.1.2.1. Demographics. Demographic information collected included age, gender, education, work experience, relationship status, and satisfaction with the current financial situation. We controlled for gender, age, financial satisfaction, and relationship status, as these variables influenced resilience (Gull, 2018; Johnson et al., 2014; Kangas-Dick & O'Shaughnessy, 2020; Zhang, 2023).

3.1.2.2. Resilience. Resilience was measured using the 10-item Connor-Davidson Resilience Scale-10 (Campbell-Sills & Stein, 2007) on a five-point rating scale (0 = not true at all, 4 = true nearly all the time). An example item is "I tend to bounce back after illness, injury, or other hardships". The scale had high internal reliability (α = 0.83).

3.1.2.3. Cognitive flexibility. The cognitive flexibility scale developed by Martin and Rubin (1995), which consists of 12 items on a six-point rating scale (1 = strongly disagree, 6 = strongly agree), was used. An example item is "I have many possible ways of behaving in any given situation." Owing to poor reliability, four negatively worded items were removed (Podsakoff et al., 2003). The final scale used for analysis had eight items (α = 0.70). The original scale was reported to have good reliability and validity (Gökçe & Güner, 2024; Mutlu & Solhi, 2024).

3.1.3. Procedure

The survey was administered online through emails and social media sites like LinkedIn. Responses were also collected offline at teacher training colleges. We ensured the participants were aware of voluntary participation and obtained informed consent. We administered the CF scale first (T1) and a resilience scale after a week's gap (T2) to ensure temporal separation.

3.1.4. Analytic strategy

SPSS Version 22 and AMOS were used to analyse the data. Analysis procedures included descriptive statistics, Pearson correlation coefficient, confirmatory factor analysis, simple and hierarchical linear regression analyses.

3.2. Results

3.2.1. Preliminary findings

Due to temporal separation, we obtained 359 responses after matching the participants' responses at two-time points. Two hundred seventy-three responses were retained after removing a few due to invariability (Ward & Meade, 2023) and individuals with work experience of more than five years. The normality of the data was assessed, and other assumptions, such as linearity and homoscedasticity, were also checked and met. The results of the preliminary analyses are given in Table 1. None of the demographic variables were significantly related to resilience and CF.

3.2.2. Main findings

CFA was performed to verify if the measured variables appropriately represent the conceptual framework's constructs. We used an item parcelling approach using partial disaggregation to improve the reliability and validity (Williams & O'Boyle Jr, 2008). Three parcels were formed for resilience, with three items in two and four in the third. CF included two parcels of four items each to maintain at least three items in both parcels. The parcels were formed at random. Construct reliability (internal consistency) was above 0.7 for resilience and above 0.6 for CF (Bagozzi & Yi, 1988). The average variance extracted (convergent validity) was above 0.5 with the factor loadings over 0.5, and the maximum shared variance was less than the average variance extracted (discriminant validity) for all the cases (Table 2). The resulting model showed a good fit with the data (χ^2 (4) = 5.88, $CMIN/DF = 1.47$, $p = .20$, $GFI = 0.99$, $TLI = 0.98$, $CFI = 0.99$, $RMSEA = 0.04$). We then imputed the scores and used them for the subsequent analysis phase.

We computed a simple linear regression analysis with CF as the independent variable since none of the demographic variables correlated with resilience. We found that CF explained a statistically significant (24 %) proportion of the variance in resilience, adjusted $R^2 = 0.24$, $F(1, 271) = 87.95$, $p < .001$. The relationship between CF and resilience was found to be positive, $\beta = 0.49$, $p < .001$, indicating that an increase in CF ($M = 3.26$, $SD = 0.36$) is associated with an increase in resilience ($M = 2.47$, $SD = 0.54$). We then performed a hierarchical linear regression with control variables in model 1 and added CF in model 2. Model 1 was not a significant predictor of resilience. We found that CF, when added, explained a statistically significant (25 %) proportion of the variance in

Table 1
Zero Order correlations, descriptive statistics and Cronbach's alpha values.

	Mean	SD	1	2	3	4	5	6	7
1. Gender	0.73	0.44							
2. Age	1.06	0.24	0.09						
3. Financial Status	1.85	1.25	−0.02	0.00					
4. Relationship Status	0.56	0.88	0.15*	0.33**	−0.02				
5. Employment Type	0.37	0.56	−0.32**	0.1	−0.01	0.19**			
6. Cognitive Flexibility	39.41	4.40	0.11	0.02	−0.08	−0.00	−0.07	**0.70**	
7. Resilience	26.95	6.61	−0.01	−0.05	−0.00	0.02	0.09	0.30**	**0.83**

Note. $n = 273$; SD = standard deviation; Age = 1: 18–35 years, 2: 36–52 years; Cronbach's alpha values are presented diagonally in bold font.
* $p < .05$.
** $p < .01$.

Table 2
Model validity measures.

Variables	CR	AVE	1	2
1. Resilience	0.84	0.64	(0.8)	
2. Cognitive Flexibility	0.69	0.52	0.40	(0.72)

Note. $n = 273$; CR = construct reliability; AVE = average variance extracted. The square root of AVE is on the diagonal in parentheses.

resilience, adjusted $R^2 = 0.24$, $F(5, 266) = 18.07$, $p < .001$.

3.3. Discussion

The result supports our hypothesis (H2) and highlights the role of CF in gaining a comprehensive understanding of resilience. While studies on this relationship are lacking, the results align with the previous studies, which implicated a general reduction in CF with an increased perception of stress and depression (Gabrys et al., 2018). CF promotes the choice of attending to or disengaging with maladaptive or unuseful thoughts and behaviour patterns in favour of healthy and adaptive ones, which could aid in resilience (Genet & Siemer, 2011; Sünbül, 2020). It is also important to note that the demographic variables did not contribute to resilience. We further extend and explore these observations in study two.

4. Study two

4.1. Method

4.1.1. Participants

In India, it has been reported that approximately 2.47 lakh pre-service teacher students or trainees aspiring to become teachers are enrolled (Ministry of Education, 2021). We employed an experimental field design at teacher training colleges in two states in the Southern part of India. Participants were 19–35 years old ($n = 193$, $n_{exp} = 133$, $n_{cont} = 60$; $M_{age} = 22.97$ years, $SD = 2.87$; women = 95.3 %). The exclusion criterion was that participants should not have previously been employed in a teaching role.

4.1.2. Measures

The same measures as in study one were used for CF (α = 0.6) and resilience (α = 0.82). We used all the 12 items for CF in study two, as it had an acceptable internal consistency (Churchill Jr, 1979).

4.1.2.1. Mindset. Mindset was measured using the "Kind of Person" implicit theory scale (Dweck, 2000). The scale has eight items measuring GM and FM, which could be administered independently. We considered the four items of FM (α = 0.68), as the statement wordings and the content were more straightforward to comprehend for the participants and did not require reverse coding. Whether GM and FM are two different continuum ends is debated (Grüning et al., 2023; Scherer & Campos, 2022). In this study, following the majority of the literature, we considered a high score on FM as indicating GM (Rammstedt et al., 2022; Yeager et al., 2019). An example item was, "The kind of person someone is, is something very basic about them and it can't be changed very much", rated on a six-point rating scale (1 = strongly agree, 6 = strongly disagree).

4.1.2.2. Character strengths. We administered the Global Assessment of Character Strengths instrument (GACS-24) (McGrath, 2017) to facilitate the participants' self-awareness of their strengths. The questionnaire describes all the strengths and asks the participants to rate their agreement on 24 items about each strength on a 7-point scale ranging from very strongly disagree (1) to very strongly agree (7). This scale facilitated the participants' familiarity with CSs and allowed for reflective exploration.

4.1.2.3. Locus of control (LoC). The intervention content and the nature of the field experiment did not allow us to check for manipulation during the intervention. To determine whether the experimental group participants followed the instructions and the intervention content, we administered a question: "I do not feel in control of my success in my career", borrowed from the core self-evaluation scale (Judge et al., 2003). The item was deemed fit as it captured the intervention's aims in the context of PSTs and was approved by the intervention experts (face validity). Responses were made on a 5-point Likert-type scale and reverse-coded (1 = strongly disagree, 5 = strongly agree).

4.1.2.4. Strengths use. To understand to what extent the experimental group participants employed their CSs, we used four items from the strengths use scale (Govindji & Linley, 2007). An example item was "I use my strengths every day". Scores range from 28 to 4, with high scores indicating high strength use. The statements pertain to the extent to which participants use their strengths in everyday life. The responses were on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). The scale showed adequate internal consistency, with Cronbach's alpha of 0.70.

4.1.2.5. Intervention fidelity check. A third-party rating form (Table 3) was prepared to maintain and check for adherence to the intervention plan and activities and to ascertain social validity. The coordinators at each college filled out this form. Questions captured several aspects, such as the facilitator's interaction, specific topics covered and the content of the sessions. They were asked to rate the statements on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). While six statements followed this format, the last question asked the respondents to check all that applied.

GACS-24, CF, mindset, strengths use, and LoC scales had translations in the states' languages below the English statements to aid in better comprehension. A professional translator was employed, and the statements were translated, reverse-translated and reviewed by both language and psychology experts. Translated and validated versions of the

Table 3
Feedback form with responses from the coordinator.

Questions
1. The facilitator was enthusiastic.
2. The facilitator appeared to be an expert on the topic.
3. The facilitator encouraged questions and answered questions appropriately.
4. The facilitator facilitated discussion among attendees.
5. The facilitator presented the information clearly.
6. The facilitator clarified what participants were asked to do between each interactional session.
7. Please check all the applicable boxes.
Options provided: Positive psychology and personality introduction, Character strengths (general), Character strengths (research), the importance of working on character strengths, Optimal use, Examples, Strengths use for previous successes, Strengths spotting with examples and activities, Strengths related handouts (4), Exploring strengths to overcome challenges.

Note. Adapted from Walker III, 2013.

resilience scale were obtained and used with permission.

4.1.3. Procedure

The intervention sessions were conducted in classrooms at the college sites. Fig. 2 describes the procedure followed. Due to low class sizes, randomisation at the sites was not feasible. Participation was voluntary, with informed consent obtained. Site-specific information is in Table 4. Participants were unaware of the study's objectives, which were introduced as part of a "Personal Development" initiative called the Character Strengths Development Workshop Series. The workshop included six sessions: the first two for baseline measures and three full sessions of about 1.5 h each, with breaks for reflection and homework. Post-intervention data were collected, and debriefing was done a week after the last session. Due to lengthy questionnaires, CSs and CF scales were administered in pre-1 (T1), and mindset and resilience scales in pre-2 (T2). Where possible, the college coordinators used simple randomisation to assign participants to intervention and control groups after the two pre-sessions, citing ease of management as the reason.

The sessions were led by the first author, a master's degree holder in psychology and a certified strengths-based practitioner, with content reviewed by subject matter experts. An intervention protocol ensured consistent delivery across colleges and sites. Using the Aware-Explore-Apply Model, the intervention incorporated elements of the "Strengths Builder" program and addressed issues like "signature strengths blindness" and over and under-use of strengths (Freidlin et al., 2017; Niemiec, 2018). We included 'positive psychology movies' (Niemiec & Wedding, 2013) with videos showing role models and their strengths. The content was adapted for the Indian student context, using examples from government and private school teachers. The workshop sessions included lecture-style PowerPoint presentations, activities, discussions, handouts, and worksheets, and the conclusion of the sessions ended in discussions. Table 5 summarises the main intervention content for each session. Participants were reminded of their homework and encouraged to engage with their strengths continuously.

4.2. Results

4.2.1. Preliminary findings

Univariate and multivariate normality (Mahalanobis's and Cook's distances) was assessed as in study one. Other assumptions, such as linearity and homoscedasticity, were also checked and met. The preliminary findings are presented in Table 7.

4.2.2. Manipulation checks

Overall, we had three approaches to check whether the participants followed the instructions and the effect of manipulation on CSs: a) An independent sample *t*-test on the LoC statement found group differences between the experimental ($M = 2.94$, $SD = 1.19$) and control ($M = 2.47$, $SD = 1.14$) groups at the post-intervention on the item ($t = -2.58$, $p < .05$); b) On day 2 of the workshop session, the strengths use scale collected the responses in the experimental group. The scores indicated high strength use with a minimum score of 15 and a maximum of 28 ($M = 23.67$, $SD = 2.70$); c) Finally, we followed up with participants on their homework activities after every session to ensure they engaged and followed the interventional content (Woelke & Pelzer, 2020).

4.2.3. Intervention fidelity check

At the end of the study, the coordinators at each college, who were present for all the sessions, anonymously rated the feedback form (Table 3) to track whether the content was delivered according to the protocol. Through this component, we also wanted to understand which aspects of the intervention the facilitator thoroughly engaged the participants in. We could collect responses from five college coordinators where intervention was delivered. The total score was summed to find that across four colleges, a complete score of 30 and at one college, 29 was obtained. Table 8 details the responses received on the last question that asked them to rate all the thoroughly covered content.

4.2.4. Main findings

4.2.4.1. Baseline differences. The baseline differences between the experimental and control groups were tested using independent sample t-tests. Levene's Test for Equality of Error Variances indicated that the variances of the groups were not significantly different for resilience and CF. Therefore, equal variances were assumed. The results of independent samples *t*-tests revealed that there were group differences between experimental ($M = 26.71$, $SD = 6.66$) and control ($M = 30.20$, $SD = 6.61$) groups for resilience ($t\ (191) = 3.37$, $p < .01$), but not for CF ($t\ (191) = -0.40$, $p = .69$) between experimental ($M = 53.24$, $SD = 5.33$) and control ($M = 52.90$, $SD = 5.78$) groups, at the baseline. There were no site differences for resilience ($t\ (191) = 1.85$, $p = .06$) and CF ($t\ (191) = 0.04$, $p = .96$). Gender differences were also not found for resilience ($t\ (191) = -1.36$, $p = .17$), and CF ($t\ (191) = -0.51$, $p = .61$).

We then computed two one-way ANOVAs to check whether the baseline scores varied among the college types. We found significant differences in resilience $F(2, 190) = 9.10$, $p < .001$. Post hoc analyses using the LSD test indicated that the mean scores of baseline resilience in private colleges ($M = 25$, $SD = 6.44$, $n = 58$) were significantly different than in government colleges ($M = 27.73$, $SD = 6.26$, $n = 49$) and aided colleges ($M = 29.73$, $SD = 6.77$, $n = 86$). However, aided did not differ significantly from the government colleges. CF scores also differed significantly, $F(2, 190) = 4.63$, $p < .05$. Post hoc analyses using the LSD test indicated that the mean scores of baseline CF in government colleges ($M = 55.12$, $SD = 5.9$) were significantly different than in aided colleges ($M = 52.63$, $SD = 5.35$) and private colleges ($M = 52.19$, $SD = 4.88$). However, aided did not differ significantly from private colleges.

We first computed two independent sample t-tests on post-intervention measures and found that there was no significant difference in resilience, $t(191) = -1.13$, $p = .13$, $d = 0.2$ between the experimental ($M = 29.62$, $SD = 7.07$) and control ($M = 28.33$, $SD = 7.78$) groups. There was a significant difference on CF ($t(191) = -2.84$, $p < .05$, $d = 0.4$ between the experimental ($M = 54.42$, $SD = 5.11$) and

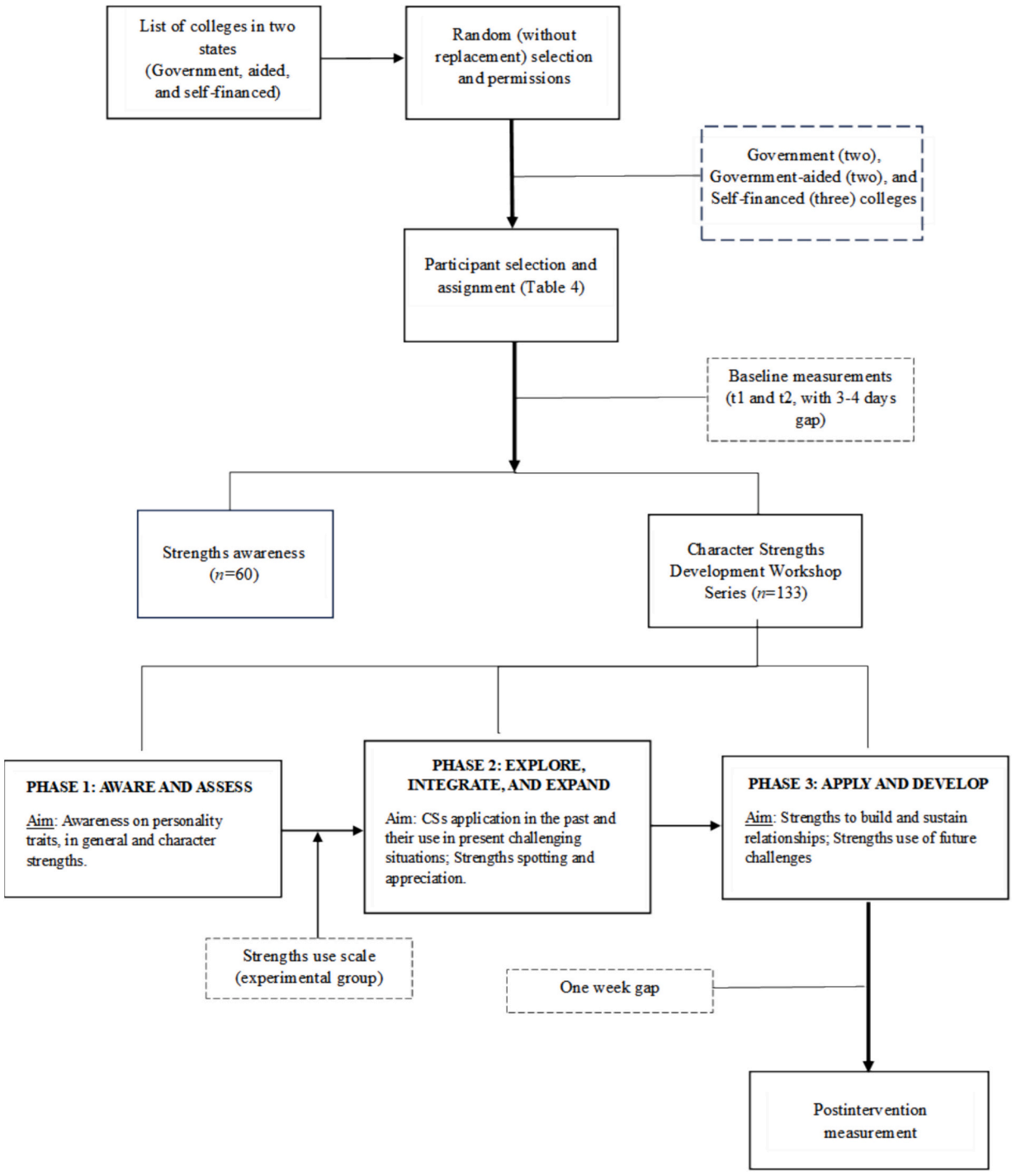

Fig. 2. Intervention design.

control ($M = 52.01$, $SD = 6.11$) groups. Two multiple regression analyses were performed with financial satisfaction (for resilience), college type (dummy coded; aided and self-financed were considered), baseline score (for resilience), and condition as predictors. Post-intervention scores were added as the dependent variables, as other demographic variables were not significant.

Firstly, all the essential assumptions were tested for resilience. Specifically, it was observed that the observations were independent (Durbin-Watson = 1.73) and absent of multicollinearity. The results revealed that the combined predictors explained a statistically significant (20.4 %) proportion of the variance in resilience at post-intervention, $R^2 = 0.20$, adjusted $R^2 = 0.18$, F (5,187) = 9.6, $p <$ .001. Only financial condition ($\beta = -0.17$, $t = -2.66$, $p < .01$), government vs aided college type ($\beta = 0.27$, $t = 3.38$, $p < .01$), and baseline resilience ($\beta = 0.16$, $t = 2.35$, $p < .05$) were found to be significant.

Secondly, all the essential assumptions for CF were tested. Specifically, observations were independent (Durbin-Watson = 2.2), and multicollinearity was absent. The results revealed that the combined predictors explained a statistically significant (5 %) proportion of the variance in CF at post-intervention, $R^2 = 0.05$, adjusted $R^2 = 0.03$, F (3,189) = 3.23, $p < .05$. We found only group ($\beta = 0.19$, $t = 2.73$, $p <$ .01) to be significant.

4.2.4.2. Group differences. Given these results, we computed two one-

Table 4
College and participant allocation to the experimental and control conditions.

College	Site		Type			Condition	
	State 1	State 2	G	GA	SF	Experimental	Control
1	√			√		√ ($n1 = 43$)	√ ($n2 = 25$)
2	√		√			√ ($n1 = 19$)	√ ($n2 = 13$)
3		√			√		√ ($n = 22$)
4		√		√		√ ($n = 18$)	
5	√				√	√ ($n = 15$)	
6	√				√	√ ($n = 21$)	
7		√	√			√ ($n = 17$)	

Note. $n = 193$. Type: G = government; GA = government aided; SF = self-financed.

way ANCOVAs with the significant predictors found in regression analysis as covariates. A significant difference on resilience (Experimental condition: $M = 29.62$, $SD = 7.07$; Control: $M = 28.33$, $SD = 7.78$) (Fig. 3), $F(1,188) = 5.03$, $p < .05$, $\eta^2_p = .02$ was observed. We also found significant differences in CF (Experimental condition: $M = 54.42$, $SD = 5.11$; Control: $M = 52.01$, $SD = 6.11$) (Fig. 4), $F(1, 190) = 7.43$, $p < .01$, $\eta^2_p = 0.04$.

Further, there were significant differences among college types for resilience, $F(2, 190) = 1.08$, $p < .001$. A post hoc analysis using the LSD test indicated that the mean scores of resilience between aided ($M = 32.22$, $SD = 7.15$), government ($M = 27.47$, $SD = 6.80$) and aided and private ($M = 26.24$, $SD = 6.26$), were significantly different. For CF, there were no differences found, $F(2, 190) = 1.08$, $p = .34$ at post-intervention among government ($M = 54.6$, $SD = 5.76$), aided ($M = 53.6$, $SD = 5.56$) and private colleges ($M = 53.01$, $SD = 5.30$).

Using the General Linear Model repeated measures ANOVAs, with time as the within-subject variable and group (experimental versus control) as the between-subject variable, we tested the group × time interaction. The results showed that for resilience (Fig. 5) ($F(1, 191) = 13.26$, $p < .001$, $\eta^2_p = 0.06$) and CF (Fig. 6) ($F(1, 191) = 3.93$, $p < .05$, $\eta^2_p = 0.02$) the interaction between time and experimental condition was significant.

4.2.4.3. Tests of conditional indirect effects. As stated in H4, GM will moderate the indirect relationship between CSI and resilience via CF; we used time (baseline = 1, post-intervention = 2) as the independent variable, CF as the mediator and mindset as the moderator, with resilience as the dependent variable. The hypothesised moderated mediation model was tested using a bootstrapping approach to ascertain the significance of the effect. PROCESS macro model 7 ($n = 266$) with bias-corrected 95 % confidence intervals ($n = 5000$) was used. Time did not have a significant effect on CF ($B = 1.18$, $SE = 0.63$, $t = 1.90$, $p = .06$) but had a significant effect on resiliene ($B = 2.36$, $SE = 0.8$, $t = 2.96$, $p < .05$).

Mindset had a significant effect on CF ($B = 0.89$, $t = 2.51$, $p < .05$). We found a significant moderated mediation effect ($\beta = 0.6$, $SE = 0.30$, 95 % CI = [0.01, 1.20]). The conditional indirect effect was strongest and only significant in those who scored high (1 *SD* above the mean of mindset) on mindset (index = 1.07, 95 % CI = [0.30, 1.95]). Time × mindset was not significant $F(1, 262) = 3.35$, $p = .06$.

4.3. Discussion

Using an experimental approach, study two supported CSI's effectiveness in enhancing CF and resilience. The absence of significant group differences at post-intervention could be due to baseline differences from a lack of randomisation. After adjusting for baseline scores, resilience significantly improved in the experimental condition but remained unchanged in the control condition, supporting the intervention. Differences among the three college types at baseline were noted. Resilience scores generally increased from baseline to post-intervention, while CF scores showed no post-intervention differences despite an increase in scores. These results indicate the facilitator's adherence to the intervention plan and positive session participation outcomes.

Financial satisfaction significantly predicted resilience, emphasising managing and acquiring resources. Financial stress can impact teacher trainees' educational performance. Although research on financial adequacy and resilience is modest, financial hardship and mental health studies support these findings (Frankham et al., 2020). Trainees dissatisfied with their financial situation might need additional resources and utilise their CSs for financial stability. They could leverage creativity and social intelligence in part-time jobs, teamwork skills in joint ventures, or humour in performance-related activities.

Table 5
Intervention content.

Phases	Content	Assignment/Activity
Day 1: Aware and assess	Personality and CSs survey discussion. We discussed why CSs are essential, their understanding, and examples of the CSs they observed in their lives or themselves. Open-ended questions guided the discussion on the strengths, overuse and underuse, and some misconceptions they might have. We used movie scenes and videos to aid the discussion. The videos have the same content, dubbed in both states' languages. (All three days had discussions on movie scenes with characters either displaying the strengths or theme of the session)	A handout with definitions, descriptions and examples of each strength was provided. They were motivated to read and get used to the strengths' language. (Homework) Prompts: a. Look at each strength and identify which of these strengths you use daily. b. Explore 3 CSs that you think are important to you. These are the strengths that you want to improve upon and use often.
Day 2: Explore, Integrate, and Expand	(2a) The homework activity opened the discussion on day two and how these strengths contributed to their past and present successes and handling challenging situations. Discussions on how strengths can work together- intrapersonal and interpersonal synergies among strengths and situationally aware strengths usage were carried out using video examples and a strengths bingo sheet. After a brief break (2b) Beyond the self: Spotting and appreciating strengths in others. An activity on strengths spotting in others was carried out.	(Homework) The sheet in Table 6 was provided, and participants were encouraged to explore and note how their most important strengths were used.
Phases	Content	Assignment/Activity
Day 3: Apply and develop	The discussion on this day was based on the following prompts after discussing the homework: 1. How can you use your strengths (participants were encouraged to consider their five important CS) to build strong relationships in a. personal and b. academic life 2. What kind of challenging situations may arise after you get your postings or during your practicum? Small groups were formed to brainstorm and share their strategies.	(Homework) Prompt: A brief plan on how you will continue to explore, use and identify strengths when you are overwhelmed by the situations in life. Handout: Strengths calendar for stress management.

Table 6
Strengths Use and Exploration Sheet.

Situation	Behaviour	Thoughts, Feelings	Strengths	Insights Gained/ Learned
Today, think about the situations in which you used your character strengths. Think about situations that gave you energy. Choose one situation. When did it occur? Where were you? Who were you with?	What did you do? What did you say? What was the interaction? Be specific	What is going through your head? What are you feeling? Rate the intensity of each feeling: 0–10, if you are comfortable	What character strengths are you using in this situation? Give an explanation for each character strength you notice.	What do you take away from this analysis? What might you remind yourself of as you move forward?

Note. Adapted from Lotta Wallin, as cited by Niemiec, 2018.

As in study one, CF contributed to resilience and mediated the effect of CSI on resilience for PSTs with a growth mindset (GM). This suggests that individuals with a GM better convert strategies into resilient patterns through active involvement and practice. The intervention facilitated autonomous motivation through content delivery, activities, homework, and discussions, promoting open expression and continuous self-monitoring (Chao et al., 2017; Cooley & Larson, 2018).

5. General discussion

5.1. Summary of key results

Research on the impact of CSI on resilience is developing (Niemiec, 2020). While limited research exists on CSI for PSTs, broader resilience intervention research is evolving, with recent emphasis on pre-service educational environments (Tobias et al., 2023). Understanding how to bolster PSTs' resilience amidst their unique stressors is crucial. Enhancing their resilience can improve their personal and professional functioning, equipping them with the necessary skills for their professional journey.

Study one found that CF predicts resilience, consistent with previous research advocating for CF in resilience assessment (Kunicki & Harlow, 2020). The cognitive-behavioural aspect, often overlooked, significantly contributes to resilience (Parsons et al., 2016). CF enables educators to shift habitual thought patterns and adopt more adaptive ones, crucial for cultivating resilience in response to changing situations. In study two, utilising a distinct sample of PSTs, our research reinforces the significance of personal resources in resilience. As posited in Polk's theory, the synergistic interaction among the clusters facilitated by CSI contributed to enhancing the resilience of PSTs. The outcomes align with prior findings on strengths-based interventions and resilience, revealing small to medium effects (Chérif et al., 2021; Tobias et al., 2023). Additionally, the results underscore the incremental effect of CSI on resilience when compared to only CSs awareness. While recognising one's strengths amid everyday stressors or significant events is advantageous, an intervention actively promoting and utilising strengths for daily interactions was impactful.

The intervention plan took a step-by-step approach, allowing participants to use their strengths to build resilience and CF. Although there was a significant difference in resilience at baseline, post-intervention scores significantly improved in the experimental group. These findings support the strengths-based resilience concept, balancing adversities and personality traits (Rashid et al., 2014). CSI enhanced CF,

Table 8
College coordinator rating.

College	Facilitator Presentation	Content	Remarks
1 (Site: 0)	30	11/11	
2 (Site: 0)	30	3/11	The selected content was optimal use, Examples, and Exploring strengths to overcome challenges.
3 (Site: 1)	30	8/11	Positive psychology introduction, Character strengths (general), Character strengths (research), importance of working on character strengths, Examples, Strengths use for previous successes, Strengths spotting with examples and activities, Exploring strengths to overcome challenges
4 (Site: 1)	30	11/11	
5 (Site: 0)	29	11/11	

Table 7
Zero-order correlations, descriptive statistics and Cronbach's alpha values.

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender	0.95	0.21													
2. FS	2.40	1.03	−0.08												
3. Education	0.34	0.47	0.05	0.04											
4. Work Exp	0.18	0.38	−0.15*	−0.03	0.01										
5. Rel Status	0.51	0.91	−0.01	−0.01	0.02	0.47**									
6. Site	0.30	0.45	−0.18*	0.04	−0.07	0.53**	0.26**								
7. Type	1.05	0.74	−0.08	−0.08	−0.10	0.4**	0.3**	0.03							
8. Condition	0.69	0.46	0.01	0.11	0.24**	−0.30**	−0.17*	−0.10	−0.09						
9. Resilience t2	29.22	7.30	0.12	−0.20**	−0.05	−0.13	0.04	−0.15*	−0.08	0.08	**0.84**				
10. CF t2	53.67	5.54	0.00	−0.09	0.06	0.02	−0.04	0.03	−0.10	0.20**	0.33**	**0.64**			
11. Resilience t1	27.80	6.82	0.09	−0.13	−0.13	−0.10	−0.06	−0.13	−0.16*	−0.23**	0.24**	0.02	**0.81**		
12. CF t1	53.13	5.46	0.03	0.02	−0.00	−0.02	0.02	−0.00	−0.19**	0.03	0.11	0.24**	0.31**	**0.6**	
13. Mindset	2.54	0.88	0.02	−0.1	−0.07	0.17*	0.08	0.18*	0.08	−0.08	0.03	0.16*	0.12	0.05	**0.68**

Note. $n = 193$. FS = financial satisfaction; Work Exp = work experience; Rel Status = relationship status; Site = two states: site 1 = 0, site 2 = 1; Type = college category: government = 0, aided = 1, private = 2; Condition: experimental = 1, control = 0; CF = cognitive flexibility; *SD* = standard deviation. Cronbach alphas are presented diagonally in bold.

* $p < .05$.

** $p < .01$.

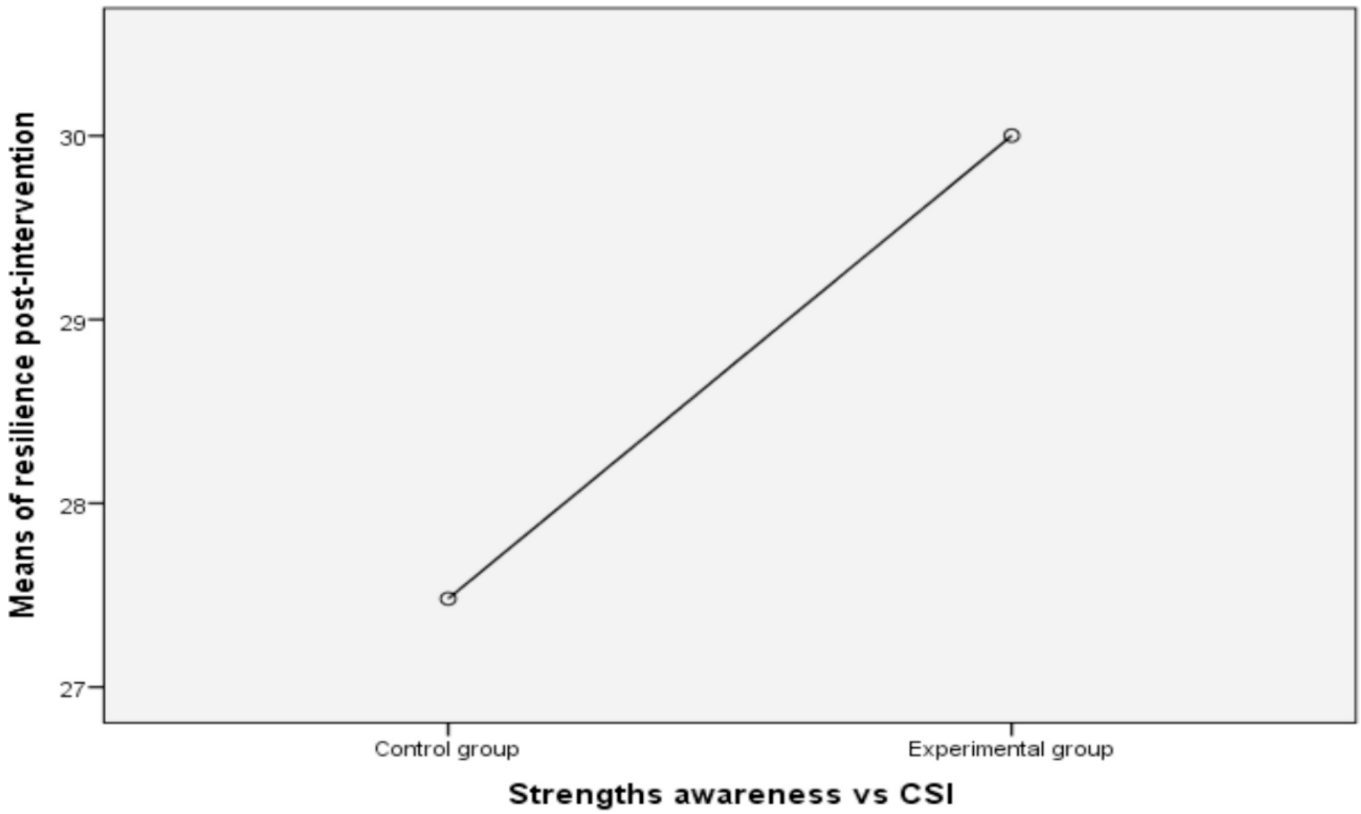

Fig. 3. The difference in post-intervention resilience scores between experimental and control groups.

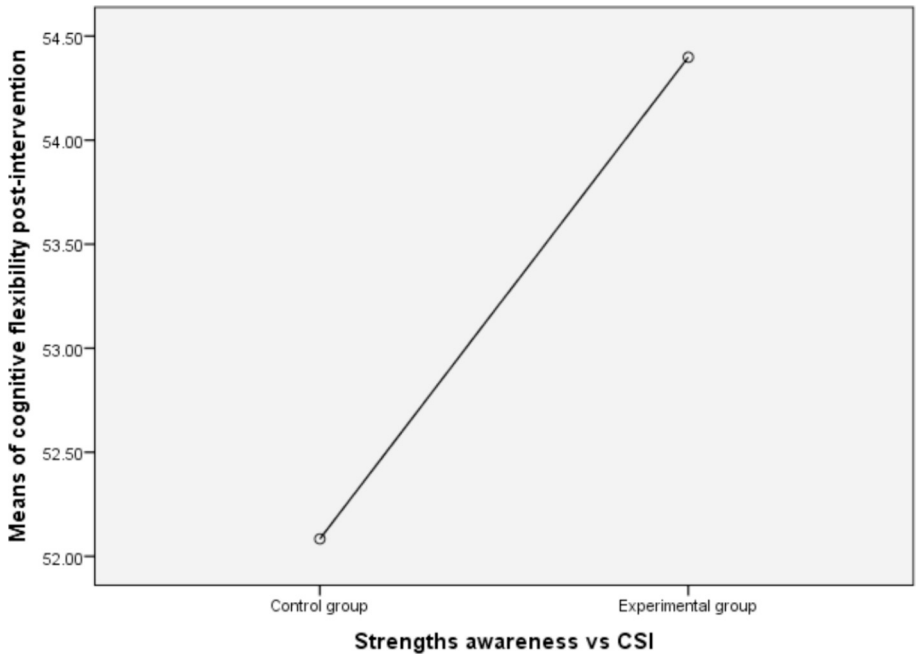

Fig. 4. The difference in post-intervention cognitive flexibility scores between experimental and control groups.

indicating the potential for using personality and internal resources to aid flexible adaptation. For example, creativity and leadership as CSs involve exploring alternative thought and behaviour patterns (Niemiec, 2018). Using creativity in sessions may have motivated participants to apply strengths based on situational demands, fostering adaptive maintenance and navigation. This likely encouraged participants to recognise their recurring response patterns and contextual cues (Vylobkova & Heintz, 2023). The results also indicate a potential for CSI to influence cognitive-behavioural strategies for an adaptive stress response by changing the HPA axis-MPFC connection, as described earlier in Section 2.3. The role of mindset, particularly a GM, in the effect of CSI on CF underscores the extent to which CSI facilitates adaptive outcomes like CF and resilience.

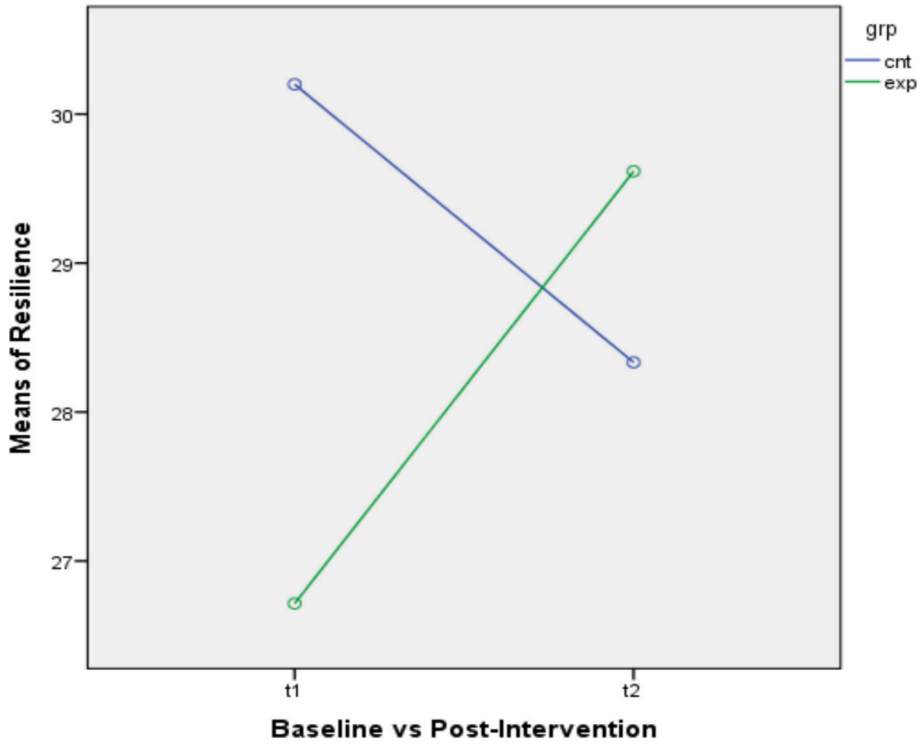

Fig. 5. The mean increase in the scores for resilience from baseline to post-intervention between the experimental and control groups.

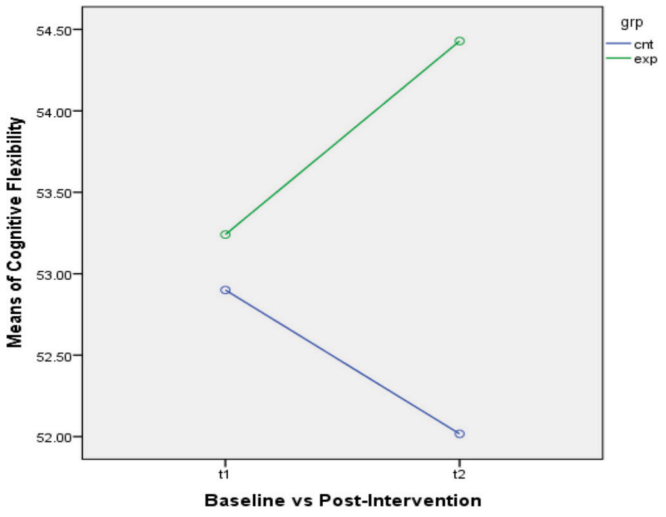

Fig. 6. The mean increase in the scores for cognitive flexibility from baseline to post-intervention between the experimental and control groups.

5.2. *Conclusions and implications*

Individual factors influencing resilience warrant further investigation, as scholars emphasise the dynamic nature of personality-related resources (Hartmann et al., 2020). By employing CSI, we address this gap by considering comprehensive and positive personality resources. Including cognitive-behavioural (CF) and affective-behavioural (mindset) factors advances resilience research toward a unifying model that comprehensively captures and understands this multi-faceted construct. We tested Polk's theory of resilience, pioneering interventional resilience research with the potential to contribute to a unifying theory of resilience through further empirical exploration.

Recognising the well-established impact of work characteristics on stressors, our study delves into how resilience and CSI manifest in PSTs, offering a unique perspective on formulating and implementing interventions. This research contributes to the positive psychological intervention literature by investigating a strengths-based approach within an understudied population. Our detailed conceptualisation of resilience addresses familiar ambiguities in intervention research (Oshio et al., 2018) while emphasising the process aspect, supporting the notion that resilience develops over time as an outcome of the synergy of personality resources, as elucidated by Polk's theory.

The intervention, conducted in a natural field setting, aligns with the trait-activation theory, which explains the enhancement in resilience (Tett & Guterman, 2000). This theory underscores the contextual influence on fostering resilience, where context-specific examples and activities may have triggered the resilience development process. Similarly, knowledge and application of strengths in daily life contribute to developing strategies for distressing situations (Rashid et al., 2014). According to this proposition, the role of CSI in promoting CF can be explained by modifying one's cognitive-behavioural tendencies influenced by mindset. This mechanism could predict resilience in PSTs by enabling them to adapt positively to changing situations. The study strengthens the theory by integrating an affective-behavioural moderator and cognitive-behavioural mediator, providing a solid foundation for future research.

This study aligns seamlessly with the motto of the teacher training colleges from which the data were collected—"Educate to Educate." Our efforts to support and empower PSTs to understand their strengths, employ them to cultivate relationships, and effectively navigate challenges extend beyond individual benefits. Educating PSTs to recognise and utilise their strengths endures as they venture into academic spaces, enabling them to identify and appreciate the strengths in their students, thereby fostering motivation to deal with the situations they face every day.

Our intervention motivates PSTs to seek and rely on their internal resources proactively. We propose several actionable strategies for educators and policymakers: a) *Curriculum development*: Integrating CSs identification and application into teacher education curricula. This can involve embedding modules focused on PP and strengths-based

approaches to education, aligning with PE. b) *Extracurricular activities*: Establishing extracurricular programs that promote the proactive use of internal resources, particularly CSs, among PSTs. Activities could include workshops, peer mentoring, and community engagement projects emphasising personal and others' strengths. Educational programs already have internships in place, and these activities can be leveraged during the internship period. c) *Empowering educators*: Training teacher educators to model strengths-based approaches is imperative. Empowering educators as role models can inspire PSTs to recognise and utilise their strengths effectively. d) *Active involvement*: Implementing practices such as displaying posters or engaging in arts-based initiatives that remind PSTs of their strengths would be a feasible addition. This could be a daily or weekly practice to reinforce positive self-perception. Facilitating the discovery of what is best in PSTs as a part of everyday interaction is another way to achieve the application of their strengths. This could be through structured feedback sessions or reflective practices integrated into their training. *e) Supportive interventions*: Teachers value and look forward to supportive intervention programs; however, they are concerned about the time to participate in and implement such programs (Guskey, 2002; Smith & Gillespie, 2007). Including short, evidence-based sessions like the present study in existing initiatives is a practical addition that the government can include as a part of the training framework for PSTs in colleges. These sessions can focus on practical applications of PE principles and how to implement them in classrooms; and f) A*lignment with existing policy initiatives*: India's National Education Policy, 2020, and the United Nations Sustainable Development Goals, 2030, within Goal Four on education, emphasise values and ethics-based curriculum. This is being executed by initiatives like the University Grants Commission's Mulya Pravah 2.0 (University Grants Commission, 2023). These trends highlight the importance and openness to incorporating value-oriented concepts in education. Aligning the CSI with these initiatives will be resource-effective and practical.

By implementing these policy-level initiatives, educators and policymakers can create a facilitative environment that fosters CSs at the educational level of PSTs. Teacher training colleges, especially, have a significant role in enabling changing perspectives on professional and personal life circumstances to mitigate the adverse effects of stress. Our approach supports a PE framework, providing a comprehensive developmental approach to teacher training. This support enables future educators to navigate training challenges and transition more effectively into in-service roles. The intervention takes a “resource unlocking” approach (Spreitzer et al., 2021), empowering PSTs to harness and strengthen existing resources to foster positive outcomes contributing to meaningful education. Moreover, the intervention contributes to the primary intervention framework, motivating further research in this field to construct interventions within these frameworks that nurture a resilient future in education.

5.3. Limitations and future directions

To the best of our knowledge, this study is the first to investigate and integrate CSI, CF, mindset, and resilience within a unified framework. However, we recognise the inherent complexity of the dynamic interaction between individuals and their external environment, including the educational context, social (academic) support, and family structure, all contributing to resilience (Smith, 2020). Including contextual factors, especially for PSTs, would further enrich the findings.

While a field experiment is recommended over a laboratory experiment, we acknowledge potential influences from unaccounted factors, lack of control over the setting, participant allocation, and unequal groups on the validity of the findings. Nonetheless, the findings demonstrate the effectiveness of CSI, which could be expanded to include diverse socio-demographic samples. Future research could explore the psychological effect of financial conditions and other socio-economic factors on the intervention's effectiveness or external aid's impact on improving resilience.

We used a self-report measure for CF, but there could be issues of bias, such as misjudgement of ability and the applicability of CF (Dang et al., 2020). Further, we had to remove negatively worded items, which could be rectified in future studies. Although the scale was found to have acceptable reliability in previous studies (Johnco et al., 2014), there is a potential to use objective measures, such as task-based or other neurocognitive ones, that have ecological validity, either in combination or individually, in replication studies. We found a moderated mediation effect in our research, and insight can be gained through the manipulation of mediation designs. Such designs would better illustrate the causal relationship between the intervention, CF and resilience. Given the crucial role of GM, future research could further explore the contribution of mindset to positive psychological interventions.

Future studies are recommended to incorporate follow-up assessments of the effects of the CSI to ensure its long-term effectiveness. Integrating neuroimaging techniques to understand how CSI influences the outcomes will encourage an exciting research dimension. Additionally, targeted interventions into how individual CSs play out as per research objectives will contribute to theory and provide information for the stakeholders and practitioners to practice. The intervention will also benefit from replications in other parts of the country and also cross-culturally.

CRediT authorship contribution statement

Gayathri Janapati: Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **V. Vijayalakshmi:** Writing – review & editing, Supervision, Resources, Methodology, Conceptualization.

Declaration of competing interest

The authors declare that there are no conflicts of interest or funding to disclose.

Data availability

Data were made available only for the reviewers. They are not openly available and will be sent upon request.

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