

Relationship between PERMA and children's wellbeing, resilience and mental health: A scoping review

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Abstract: The PERMA (Positive Emotion, Engagement, Relationship, Meaning, Achievement) model can be used to describe the factors that contribute to wellbeing. As many children face mental health challenges worldwide, strategies to increase wellbeing and resilience have become increasingly desirable. The aim of this scoping review was to establish what is known from the literature about the relationship between the components of PERMA, including character strengths, and primary school-aged children's mental health, resilience and wellbeing. Four databases were systematically searched, and 20,128 articles were identified, 190 of which were included in the review. The relationships were typically in the expected directions, with PERMA aspects associated with greater wellbeing and resilience, and fewer symptoms of mental illness. There are notable gaps in the existing literature, particularly in the Engagement and Meaning facets of PERMA. Overall, it appears that the components of PERMA do have a positive impact on children and can be considered as an approach for protecting children against mental ill-health.

Keywords: wellbeing; mental health; resilience; PERMA; character strengths; children

1. Introduction

The reported rates of children's mental illness are alarming worldwide, with the World Health Organisation (WHO) (2022) reporting that 10% of children and adolescents experience a mental disorder. In the US this number was estimated to be closer to 13-20% in 2007 (Centers for Disease Control and Prevention [CDC], 2021) and in Australia close to 14% of children and adolescents experienced a mental disorder in 2014 (Australian Institute of Health and Welfare, 2020). Furthermore, these rates (particularly of anxiety and depression) have been rising (CDC, 2021). Importantly, mental disorders in childhood, such as depression and anxiety, inhibit functioning in multiple domains and can have lasting impacts on psychiatric and physical health (Abela & Hankin, 2008; Essau & Ollendick, 2013). Even without the presence of a disorder, children can experience poor mental health (Keyes, 2005). Mental health is described as a state of wellbeing (Keyes, 2005; WHO, 2018). While the improvement of mental ill-health is of critical importance, this broader perspective allows the consideration of how mental health can be improved for all children.

In line with this broader perspective, the positive psychology framework suggests that addressing mental illness should not be about only minimising suffering but working towards a state of 'flourishing' (Seligman, 2011). It is this state of flourishing that Seligman (2011) describes as wellbeing. Historical perspectives of wellbeing tend to be categorised as either hedonistic, from Greek philosopher Arristipus', which can be described as happiness that comes from

pleasure in place of pain (Disabato et al., 2016); or eudaimonic, from Aristotle, which focuses more on fulfilment and meaning (Ryan & Deci, 2001). Subsequent theories have typically focused on one of these broad ideas, such as Diener's (1984) subjective wellbeing, which focuses on a hedonistic view or Ryff's (1989) psychological wellbeing, which takes a eudaimonic approach. According specifically to Seligman (2011), however, wellbeing is built by five components, which he describes in the PERMA model. Within the PERMA model, both hedonistic and eudaimonic theories are represented. Furthermore, PERMA is not a 'type' of wellbeing but a framework to describe the building blocks of wellbeing. The PERMA Profiler measure has been found to correlate very highly with subjective-wellbeing, suggesting that these are similar constructs (Goodman et al., 2018). Large correlations have also been observed between Ryff's Psychological Wellbeing Scale and the PERMA Profiler (Giangrasso, 2021). Seligman (2018) concedes that while subjective wellbeing, for example, may be an appropriate way to measure the construct, it does not offer a framework to guide how to improve wellbeing. This 'building' of wellbeing is what PERMA has to offer to the literature.

The PERMA framework encapsulates five elements of wellbeing, including: Positive Emotion (P), Engagement (E), Positive Relationships (R), Meaning (M) and Achievement (A) (Seligman, 2011). Positive Emotion includes aspects such as happiness and life satisfaction. Engagement refers to the 'flow' state, in which individuals are completely engaged in a task. Positive Relationships is the prosocial element of wellbeing. Meaning suggests that wellbeing involves belonging to and serving 'something you believe is bigger than the self' (p. 17). Achievement is the final aspect of the PERMA framework and refers to the experience or pursuit of mastery or accomplishment (Seligman, 2011).

The PERMA framework also encompasses a large variety of values or 'Character Strengths' that do not conform to a single aspect of the framework, but that have been positively associated with each element of PERMA, in varying degrees (Wagner et al., 2019). There are 24 Strengths in total, including traits such as gratitude, kindness, hope, zest, honesty and creativity (Peterson & Seligman, 2004). These Strengths are an important part of the PERMA framework, helping to fully encapsulate the diversity of the five aspects. The Strengths are often used in the practical application of PERMA, for example the Celebrating Strengths project (Fox Eades & Gray, 2017), or gratitude interventions (Wood et al., 2010).

The concept of resilience has grown in popularity in the discussion of mental health. While definitions of resilience are still somewhat up for discussion, at its core resilience is an ability to 'bounce back' or continue in the face of adversity (Herrman et al., 2011). While resilience has been a subject of research for many decades and is a distinct construct, it has been notably connected with positive psychology as it focuses on strengths and protective factors (Luthar et al., 2014). Resources that contribute to the development of resilience include personal assets (e.g., optimism and hope) and interpersonal resources, such as a supportive and caring family (Kuldas & Foody, 2021), these examples clearly link to PERMA. Resilience is also considered to be a preventative factor against the development of mental illness (Davydov et al., 2010).

There are strong links between mental health, wellbeing and resilience, and the PERMA framework. The purpose of the PERMA framework is to build wellbeing, therefore it is critical to know if the PERMA components do indeed impact upon outcomes of wellbeing. PERMA components should also impact resilience through building protective resources. We ultimately want to know if PERMA can improve children's mental health and protect against mental illness, and thus the relationship between PERMA components and these outcomes needs to be clearly mapped.

Within the literature, there is no clear review or summary of PERMA as a whole and its

relationship with either mental health or resilience. Nevertheless, there is evidence pointing to the likelihood that PERMA is related to these outcomes. For example, positive psychology principles have been applied in school settings, such as gratitude interventions and the Penn Resiliency Program which have seen increases in wellbeing and decreases in anxiety and depression (e.g. Seligman et al., 2009; Wood et al., 2010). Similarly, correlations have been observed between constructs such as optimism with resilience and mental health (e.g., Keyfitz et al., 2013). While this suggests a relationship exists between PERMA and these three outcomes, there has been no systematic examination of these relationships to our knowledge. Such a review would allow relevant stakeholders, such as teachers, clinicians, parents, counsellors, and communities, to have a clear understanding of which of the PERMA elements have an evidence-base when it comes to improving children's wellbeing, resilience and mental health. Furthermore, it would provide researchers with clarity about what evidence exists, and where the gaps are for future research.

In order to have a complete picture of what literature currently exists and whether there is evidence of PERMA's relationship with children's wellbeing, resilience and mental health specifically, a scoping review is justified. The objective of this paper is to undertake a scoping review to establish what is known from the literature about the relationship between the components of PERMA and primary school-aged children's mental health and ill-health, resilience and wellbeing. A scoping review allows for a summary of knowledge that has been conducted in diverse methodologies, as well as to explore the extent of evidence in a particular area (Tricco et al., 2018). Both of these qualities of scoping reviews are necessary to address the objective of this paper.

2. Methods

This scoping review has been executed in line with the PRISMA-ScR guidelines (Tricco et al., 2018) and the JBI methodology for scoping reviews (Peters et al., 2020). A protocol for the scoping review is registered on the Open Science Framework, accessible at <https://osf.io/3eqfm/>.

2.1 Eligibility criteria

Only studies involving primary school-aged children (5 to 12 years old) were considered. If the mean age was less than 5 or greater than 12, the study was excluded, unless age specific data could be extracted. This age range was adjusted from the protocol (6 to 12 years) to better encapsulate the full age range of children attending primary school.

Studies that include one or more of the PERMA components (including Strengths), as well as one or more of the outcomes (e.g., mental health/ill-health, wellbeing or resilience) were considered. This included studies that contain these outcomes with generally accepted terms, for example studies that include reference to mental health, a mental disorder (e.g., anxiety, depression) or symptoms of disorder (e.g., internalising and externalising symptoms). While we broadly term this outcome 'mental health', to encompass the accepted terms in the literature, it is primarily reflective of mental illness. For the wellbeing outcome terms such as wellbeing, life satisfaction, flourishing and quality of life (excluding health specific quality of life) were accepted. Due to the discrepancies in definitions of resilience, only studies that included specific reference to a resilience measure or outcome were included.

2.2 Types of sources

This review considered a wide range of studies (including interventions, experimental and

correlational studies). Qualitative literature, mixed-methods and reviews were also considered if relevant to the topic. Only peer-reviewed studies were included for the purpose of quality assurance. Only studies written in English were considered, as translation was beyond the resources of the study.

2.3 Information sources

A search was conducted on PsycINFO, MEDLINE, Scopus and Embase. The search strategy, including selection of databases, was planned, and executed in consultation with an expert research librarian. No educational databases were selected as it was thought that these would focus primarily on educational issues (e.g., teaching and learning, curriculum, etc.). The search was performed on 20th July 2021, with alerts for new articles added up to and including August 4, 2022. A full search strategy for PsycINFO is included in Appendix A. Searches were adjusted for each database to reflect appropriate subject headings. No grey literature was searched due to feasibility.

2.4 Selection of sources of evidence

All sources were uploaded into EndNote for screening. Two independent reviewers performed a pilot test of title and abstract screening, to ensure clarity of the eligibility criteria, for 50 articles and reached 94% agreement. Disagreements were resolved through discussion between the reviewers and were presented to the team of authors for further validation. One reviewer then performed the remaining title and abstract screening.

A pilot was repeated for the selected articles at full-text level, with two independent reviewers screening 10 full-texts and reaching 80% agreement. Disagreements were, again, resolved through discussion between the reviewers. The independent reviewers screened another 10 articles and came to an acceptable agreement of 90%. One reviewer subsequently screened the remaining full-texts, in consultation with the team. Reasons for exclusion at the full-text stage are detailed in the flow-chart (Figure 1).

In the protocol, the intention was to have two reviewers complete all screening, however the study did not have sufficient resource for two reviewers to examine the large number of studies found. A suitable alternative was discussed by the team, consulting the PRISMA guidelines and applying the pilot testing method described above.

Quality appraisal was conducted by one reviewer, using the JBI Critical Appraisal Tools (Munn et al., 2023). A percentage was calculated depending on how well papers met criteria and then a quality rating allocated: high (>70%), moderate (50-60%) or low (<50%). A quality appraisal was not planned in the protocol but was added to strengthen the review.

2.5 Data charting process

Data were charted using the data extraction tool designed for this study, as outlined in the protocol. The extraction tool was amended to include a 'Relevant Results' section in order to more fully answer the research questions. The team of authors was consulted when necessary to resolve any uncertainties.

2.6 Data items

Items extracted included: characteristics of the studies (year, country, context, participants and study design), the PERMA components that were included, the outcomes included, and the results pertaining to the relationship between these. Only results relevant to the research question

(i.e., explaining the relationship between a PERMA component and one of the outcomes) were extracted. The Relevant Results section included both quantitative and qualitative results as appropriate to the study design. Full-text articles that could not be found were requested through a library document delivery service, however nine articles were unable to be located.

3. Results

Figure 1. Flow chart of inclusions and exclusions

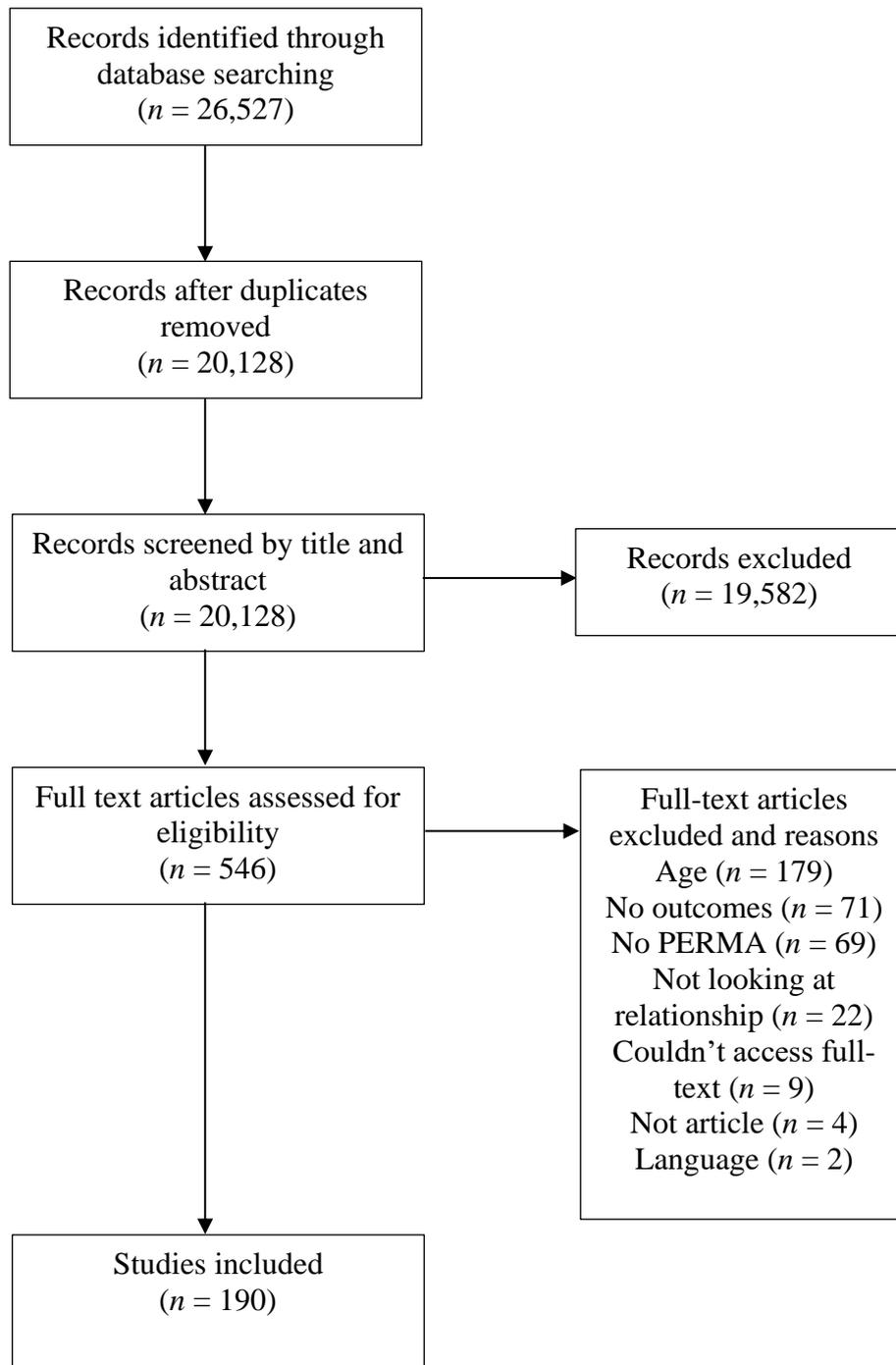


Figure 1 displays the flow of inclusion and exclusion decisions at each stage of screening for studies found in the search strategy. A full list of included studies is contained in Supplemental File 2. The data extracted from the included 190 studies are available in Supplemental File 1. Most

studies were of high quality ($n = 129$), while some were moderate ($n = 58$) or low ($n = 3$). Characteristics of the studies are summarised in Table 1, and tallies of which PERMA components and outcomes, as well as which Strengths, were represented can be seen in Table 2 and 3, respectively.

Table 1. Characteristics of studies included in review

Characteristic	<i>n</i>
Year	
2018-2022	68
2013-2017	63
2008-2012	29
2003-2007	16
1998-2002	7
1993-1997	4
1988-1992	3
Country	
US	53
Canada	20
UK	20
Australia	13
China	13
Netherlands	9
South Africa	7
*Other	55
Type of study	
Model/Framework	13
Case studies	2
Cross-sectional	61
Longitudinal	34
Intervention	40
Qualitative	14
Mixed-methods	4
Review	21
Meta-analyses	1

Notes. *Countries not listed (*n*): Argentina (1), Belgium (1), Brazil (1), Chile (2), Czech Republic (1), Denmark (1), Ethiopia (1), Finland (4), Germany (3), Greece (1), Iceland (1), India (2), Indonesia (3), Ireland (1), Israel (3), Japan (1), Korea (4), Malta (1), Mongolia (1), Norway (3), Palestine (1), Portugal (3), Singapore (1), Spain (2), Sweden (4), Taiwan (2), Thailand (1), Turkey (1), Vietnam (1), Wales (1), Zambia (2).

3.1 Model/framework

These studies were theoretical in nature, proposing models and frameworks within this area. All three outcomes were reported in models or frameworks, including wellbeing ($n = 8$), resilience ($n = 7$) and mental health ($n = 7$). The models and frameworks were most typically prepared for clinical contexts, ranging from summaries of broad concepts to specific strategies to support clinicians, particularly with children who are at risk in some way. A small number of these sources were directed at those working with children within the school context, such as SEL

programs. It was proposed that Positive Emotions are associated with greater wellbeing in children with cancer (Phipps, 2007), as well as activating the reward centre of the brain, leading to improved outcomes in clinical treatment (Schlechter et al., 2019). Relationships were a key factor within these studies, and were connected with improvements in all three outcomes across a variety of studies (Greenberg, 2017; Konu & Rimpelä, 2002; Newland, 2014; Schlechter et al., 2019; Sege et al., 2017).

Table 2. Number of studies including both PERMA element and outcome

PERMA	Outcome	<i>n</i>
Positive Emotions	Wellbeing	25
	Resilience	13
	Mental health	20
Engagement	Wellbeing	7
	Resilience	2
	Mental health	3
Relationships	Wellbeing	46
	Resilience	23
	Mental health	59
Meaning	Wellbeing	7
	Resilience	5
	Mental health	7
Achievement	Wellbeing	11
	Resilience	12
	Mental health	18
Strengths	Wellbeing	51
	Resilience	34
	Mental health	41

Notes. *n* = number of studies

Table 3. Strengths represented in studies

Strengths	<i>n</i>
Hope	32
Creativity	17
General strengths	14
Spirituality	13
Gratitude	12
Self-regulation	8
Kindness	6
Humour	3
Forgiveness	3
Zest	2
Leadership	2
Love	1
Appreciation	1
Persistence	1
Curiosity	1

Notes. *n* = number of studies. General strengths refer to where strengths were measured as a single construct and no details were given of what specific strengths this included.

Several Strengths were represented, with Bostic et al. (2019) discussing how music can alter mood and improve positive mental health. Schlechter et al. (2019) proposed that Strengths should be discussed in clinical interviews to improve patient outcomes. McCrea et al. (2016) suggest that hope provides children with resilience and Newland (2014) put forth a wellbeing model that includes self-regulation and suggests that humour is a protective factor for children at risk. Finally, Zhang (2013) describes how spirituality is a part of both children's wellbeing and coping strategies.

3.2 Case studies

Only two case studies were included, both in clinical contexts, reporting on wellbeing ($n = 1$) and mental health ($n = 1$). Case studies provided evidence for a positive relationship between hope and wellbeing in a boy with cystic fibrosis (Anbar & Murthy, 2010) and support for relationship centred care in improving positive mental health (Holder et al., 2015).

3.3 Cross-sectional

Cross-sectional studies were in a range of contexts, including school ($n = 38$), community ($n = 9$), family ($n = 5$), clinical ($n = 2$), rural communities ($n = 2$), general population ($n = 1$), post-disaster ($n = 1$) and international surveys ($n = 2$).

Wellbeing was reported on in 27 cross-sectional studies. Positive Emotions were consistently reported to positively correlate with different measures of wellbeing (Choi et al., 2019; Corominas et al., 2020; Shoshani & Russo-Netzer, 2017; Veronese et al., 2012) as were peer, parent and teacher relationships (Butler et al., 2022; Chai et al., 2019; Corominas et al., 2020; Elvin et al., 2021; Fayed et al., 2015; Gadermann et al., 2016; Guhn et al., 2013; John-Akinola & Gabhainn, 2015; Liu et al., 2020; Mínguez, 2020; Palsdottir et al., 2012; Terry & Huebner, 1995). Meaning and Achievement were also positively correlated with life satisfaction (Choi et al., 2019; Elvin et al., 2021; Finch et al., 2020; Ojala, 2012; Shoshani & Russo-Netzer, 2017). Strengths such as hope, creativity, self-regulation, some aspects of spirituality, and forgiveness were positively correlated with measures of wellbeing (Chai et al., 2018; Earhart et al., 2009; Elvin et al., 2021; Holder et al., 2016; Holder et al., 2010; Liu et al., 2020; Shoshani & Russo-Netzer, 2017; van der Wal et al., 2016).

Resilience was reported on in fewer studies ($n = 11$). Positive emotionality and optimism, relationships with parents, teachers, mentors and friends and meaning in life were all correlated with increased resilience (Chai et al., 2018; Chun & Chung, 2011; Damm et al., 2022; Du et al., 2017; Finch et al., 2020; Im & Kim, 2012; Keyfitz et al., 2013; Lengua, 2002). One interesting thing to note was that Achievement was found to have no relationship with resilience in two separate studies (Im & Kim, 2012; Somchit & Sriyaporn, 2004). Spirituality and self-regulation were two Strengths that were reported to have a positive relationship with resilience (Lengua, 2002; Nauli & Mulyono, 2019).

Mental health or ill-health were included in 40 studies. Mental ill-health was negatively correlated with optimism, parent, peer and teacher relationships, meaning in life and academic achievement (Bang et al., 2018; Bate et al., 2021; Bergeron et al., 1992; Bergeron et al., 2007; Chun & Chung, 2011; Drugli, 2013; Du et al., 2017; Fayed et al., 2015; Felix et al., 2013; Finch et al., 2020; Graham-Bermann et al., 1996; Guhn et al., 2013; Keyfitz et al., 2013; Kroesbergen et al., 2016; Lin et al., 2011; Manfro et al., 2017; Samara et al., 2020; Shoshani & Russo-Netzer, 2017; Stocker, 1994). Of the Strengths, hope was consistently found to have a negative relationship with externalising and internalising symptoms (Cedeno et al., 2010), anxiety, including social anxiety (Sahranc et al., 2018), and depression (Chai et al., 2018; Elvin et al., 2021; Finch et al., 2020). Self-regulation was also negatively related to anxiety and depression (Elvin et al., 2021). A measure of gratitude,

optimism and zest was found to correlate negatively and significantly with depression (Wang et al., 2018).

Engagement was not reported in relation to wellbeing, resilience or mental health in any cross-sectional studies. A few caveats were found in the relationship between Relationships and mental health. Closeness of relationships with parents was not significant unless both parents were not close to the child or a single father was not close (Lin et al., 2013). Family environment was found to have a relationship with mental health problems (Saputra et al., 2017), but not family structure (Hakvoort et al., 2011). Unlike parent and peer relationships, having a close grandparent had no significant relationship with internalising or externalising behaviours (Van Heerden & Wild, 2018). In girls, peer connectedness was associated with greater rather than less anxiety (Guhn et al., 2013).

Achievement also behaved differently in some specific contexts; for example, internalising symptoms were associated with lower achievement in low-income but not affluent children, and externalising symptoms with poorer achievement in low-income girls, but not low-income boys or affluent children (Luthar & Latendresse, 2005). In Taiwan, academic achievement was associated with lower depression in immigrant but not native families (Lin et al., 2011). Pedersen et al. (2019) found that academic achievement was associated with less internalising problems, they reported that it was not associated with anxiety or depression. Notably, highly creative children had higher internalising and externalising problems (Kroesbergen et al., 2016) Van Breda (2022) found academic achievement was positively correlated with resilience when parent reported, but not by self-report.

3.4 Longitudinal

Contexts represented in longitudinal studies were schools ($n = 18$), cohort or large studies ($n = 10$), family ($n = 2$) and an international survey ($n = 1$). Longitudinal studies were varied in length, with some school studies performing follow ups within a year and cohort studies spanning entire childhoods.

Wellbeing was reported in 13 longitudinal studies. In most cases, relationships were in the expected direction between the PERMA components and wellbeing. Smiling (Lengua, 2003), prosocial behaviour, such as teacher connectedness and sharing (in older children) (García-Moya et al., 2015; Sabato & Kogut, 2019) and Achievement were associated with greater wellbeing (Degoy & Olmos, 2020; Marques et al., 2011; Yang et al., 2019). Both positive and negative parent-child relationships were found to correlate with child wellbeing outcomes, with a positive relationship associated with greater wellbeing and a negative relationship with less (Essler et al., 2021). One standout was that self-regulation was not related to wellbeing (Lengua, 2003). Other Strengths were positively related with wellbeing, however, such as: creative abilities and wellbeing (Gubbels, 2017), hope and life satisfaction (Marques et al., 2011; Marques, 2016; Ng, 2014), and gratitude and life satisfaction (Froh, 2010).

Resilience was not commonly reported on in longitudinal studies ($n = 3$). One study did, however, report correlations between Engagement and increased coping (Skinner et al., 2016) and another between ego-resiliency and Achievement measures (e.g., reading, maths scores) (Kwok et al., 2007).

Mental health was included in a number of longitudinal studies ($n = 21$). For mental health outcomes, the relationships were mostly in the expected directions. Engagement had a significant, positive relationship with mental health (Marques, 2016). Several Relationship aspects predict internalising and externalising problems, including early peer problems, friendships, poor school connectedness and parent-child relationships (Flouri et al., 2015;

Goetschius et al., 2021, McArthur et al., 2021; Toseeb et al., 2020; Wang et al., 2018). Peer relationships were also found to have a negative relationship with depression (Chen et al., 2012). The relationship between Achievement and mental health was supported, however, only academic-related achievement was reported, and longitudinal studies tended to consider mental health as the predictor, rather than the outcome. For example, being mentally healthy in 1st grade predicted achievement in 4th grade (Guzman et al., 2021). Mental health risk had a negative association with academic achievement (Murphy et al., 2015), as did depression specifically (Li et al., 2021; Panayiotou, 2019). Finally, high externalising and internalising scores predicted lower academic achievement (Mekonnen et al., 2020). Several insignificant findings were reported for Strengths, self-regulation was not related to externalising or internalising symptoms in one study (Lengua, 2003), though it was associated in another study (Flouri et al., 2014). Family spirituality was not significantly associated with an anxious/depressed outcome (Barbarin et al., 2001) and a spiritual program was related to lower levels of internalising symptoms but not externalising symptoms (Schottenbauer et al., 2007). Hope and positive mental health were, however, positively related (Marques et al., 2011).

3.5 Interventions

Interventions were primarily in the school context ($n = 29$), followed by community ($n = 4$), clinical ($n = 3$), and family ($n = 1$), with a few looking specifically at children in residential homes ($n = 1$), refugee camps ($n = 1$) and post-disaster ($n = 1$).

Interventions that included wellbeing ($n = 17$) as an outcome were varied, involving positive psychology interventions, character strengths interventions, kindness, mindfulness, happiness, spirituality, peer support, gratitude, hope, forgiveness and father support interventions. In all interventions the wellbeing outcome increased; however, in two interventions it also increased in the control group and there was no significant difference between the two (Froh et al., 2014; Layouts et al., 2012).

A small number of interventions included resilience as an outcome ($n = 7$). Resilience increased in a humour intervention for the experimental group (Sim, 2015), in the GROW character strength program (Seale et al., 2021) and in a spirituality program (Pandya, 2018). The resilience scale of reactivity increased in an Arts program but the other two scales (mastery and relatedness) did not (Coholic et al., 2012). A hope-theory based intervention also saw an increase in resilience over time (Kirby et al., 2021).

Mental health was measured in most studies ($n = 29$), and typically interventions based on PERMA components were associated with decreases in mental health symptoms at post-intervention. Positive Emotions was associated with decreases in depression (Arora & Sharma, 2018; Carter et al., 2018; Foka et al., 2021; Schonert-Reichl et al., 2015; Shoshani et al., 2016), interventions that involved Relationships saw improved mental health (Beaumont et al., 2019; Feinberg et al., 2013; Goodkind et al., 2012; Healy & Sanders, 2018; Kiviruusu et al., 2016; Ohl et al., 2013; Powell & Thompson, 2016), Meaning was able to explain variance in mental health scores (Armstrong et al., 2019) and Achievement was connected with decreased depression in one intervention (Schonert-Reichl et al., 2015). Hope, creativity, leadership, spirituality and forgiveness were all involved in different interventions that had positive impact on anxiety and depression or internalising and externalising symptoms (Hui & Chau, 2009; Moula et al., 2022; Pandya, 2018; Rich et al., 2022; Rousseau et al., 2005; Shoshani et al., 2016).

There were a few studies where no effect was reported. In four cases there was no significant change in mental health. One study saw no change in positive affect or mental health symptoms (Foster et al., 2016). Another program saw no impact on hope or PTSD (Tol et al., 2010). In the

context of refugee and immigrant children, a creative arts-based intervention had no significant effect (Kevers et al., 2022). No significant effects were found for anxiety in a digital school-based intervention that focused on general Strengths (Shum et al., 2019). One notable point was that the Together at School intervention was effective in the 3rd grade, but not in 1st grade (Kivuruusu et al., 2016). There is some variability in the effectiveness of interventions incorporating PERMA, however as is demonstrated there are a large number of interventions that were successful in increasing wellbeing and resilience, and decreasing mental ill-health.

3.6 Qualitative

Contexts of qualitative studies included school ($n = 5$), community ($n = 4$), residential care or children's homes ($n = 4$), and clinical ($n = 1$).

Within the qualitative literature, wellbeing was included in several studies ($n = 7$). Positive Emotions were linked with wellbeing in these studies, specifically happiness (Ninomiya et al., 2021). Engagement in activities that are enjoyable, as well as achieving (Achievement) desired goals were suggested to contribute to life satisfaction (Linh et al., 2021). The component of Relationships was represented in a large number of these studies, most often positively relating wellbeing to parent-child relationships, but also in terms of supportive relationships, connectedness and meaningful friendships (Benninger & Savahl, 2016; Boström & Strand, 2021; Linh et al., 2021; Pérez-Aronsson et al., 2019; Sabolova et al., 2020). Finally, the Strength of hope was also suggested to promote children's wellbeing (Pérez-Aronsson et al., 2019).

Resilience was reported on in seven studies. Relationships were, once again, a frequently occurring theme in relation to resilience. Relationships were described as increasing resilience through family, community and support networks (Braband et al., 2018; Pienaar et al., 2011), classroom belonging (Cefai, 2007), connections (Forrest-Bank, et al., 2014), and cohesion with others in the context of art-based activities (Coholic et al., 2012). Strengths, such as spirituality or faith, humour, recognition, creativity and hope were described as contributing to resilience (Braband et al., 2018; Cefai, 2007; Coholic et al., 2012; Forrest-Bank, et al., 2014; Mohangi et al., 2011; Pienaar et al., 2011). Engagement in the classroom, Positive Emotions (e.g., optimism and positive expectations) and Achievement motivation were also related to resilience in these studies (Cefai, 2007; Mohangi et al., 2011; Pienaar et al., 2011).

Qualitative work reporting mental health in this area were sparse ($n = 1$). One study connected Relationships with improved mental health, including being in nurturing and supportive relationships, social engagement and a sense of connectedness (Benninger & Savahl, 2016).

3.7 Mixed-methods

Mixed-methods studies were primarily conducted in the school context ($n = 2$), with a clinical context ($n = 1$) and refugee/migrant context ($n = 1$) represented as well. Two of these studies were interview based, including both qualitative and quantitative data, and two were non-randomised trials. In these studies, all outcomes were reported on, including wellbeing ($n = 2$), resilience ($n = 2$) and mental health ($n = 2$). Interventions that utilised a mixed-methods approach are detailed in the Interventions section. Gervais et al. (2021) found that attribution of Meaning (when immigrating) was a protective factor for children. Boniwell (2016) reported on personal wellbeing lessons that included Positive Emotions, Engagement, Relationships and Strengths but found no impact on general life satisfaction. Kirby et al. (2021) found a hope programme led to a significant decrease in anxiety, and described hope as a relevant thematic outcome. Finally, Barfield & Driessnack (2018) looked at wellbeing for children with ADHD and reported that connections was one of the recurring themes of what makes life 'really good' for such children, reinforcing

the relationship between Relationships and wellbeing.

3.8 Reviews and meta-analyses

Wellbeing was included in eight reviews. Experiencing Positive Emotions and Achievement were both positively correlated with life satisfaction (Park, 2004; Suldo et al., 2006). In Barry et al.'s (2013) systematic review of mental health promotion interventions that included Relationships and Strengths, wellbeing was seen to increase in several of the included studies. Strengths were frequently associated with wellbeing, including: forgiveness (van der Wal et al., 2017); gratitude, which causes increases in wellbeing (Layous & Lyubomirsky, 2014); creativity and hope, after participating in creative expression programmes (Beauregard, 2014); and general character strengths (Park, 2004). An interesting finding reported in van der Wal et al. (2017) was that forgiveness was related to wellbeing, but only when forgiving a friend as opposed to someone who was not a friend.

Resilience was common in reviews ($n = 14$). Positive emotions, such as a positive outlook, were related to resilience (Pieloch et al., 2016; Zolkoski & Bullock, 2012). Relationships were considered to be a source of resilience, including: social support, connectedness with family, friendships, positive relationships with teachers, a close bond with a caregiver, and in the context of divorce, a good relationship with at least one parent and with siblings (Gorell Barnes, 1999; Holaday & McPhearson, 1997; Marriott et al., 2014; Neiman, 1988; Pieloch et al., 2016; Sleijpen et al., 2016; Zolkoski & Bullock, 2012). Achievement, in terms of academics (Marriott et al., 2014), as well as the experience of success or achievement (Neiman, 1988) were linked to resilience. Meaning, in particular assignment of meaning and finding meaning after parental divorce, were considered to be factors that improve resilience (Gorell Barnes, 1999; Holaday & McPhearson, 1997). Strengths that were reported to be sources for resilience included spirituality/attending church, hope, self-regulation, creativity and general character strengths (Beauregard, 2014; Bullock, 2012; Cheng et al., 2015; Marriott et al., 2014; Moula et al., 2020; Mullin, 2019; Park, 2004; Sleijpen et al., 2016; Zolkoski & Bullock, 2012). Park (2004) described the relationship as the character strengths buffering against adversity. Some reports, however, suggested that there were mixed findings for the impact of creative expression programmes on resilience (Beauregard, 2014). Cheng et al. (2015) present an interesting view of the relationship between creativity and resilience, explaining that in China creativity is viewed more as what can be attained in the face of limited resource and so described creativity as somewhat synonymous with resilience.

Mental health was included in eight reviews. Rohner & Veneziano (2001) reported mixed findings on how mother and father relationships with a child impact mental health problems and psychological adjustment. Poor achievement, in the school context, were associated with internalising and externalising problems (Romano et al., 2015). Strengths, creativity in particular, seemed to be connected with mental health through reviews conducted on creative expression programmes and arts therapies. Such programmes were shown to be effective in children impacted by mental health difficulties, decreasing emotional and behavioural issues and internalising/externalising behaviours, as well as significantly decreasing PTSD symptoms (Beauregard, 2014; Sullivan & Simonson, 2016). Arts therapies reportedly had small impacts on depression and anxiety (Moula et al., 2020). Gratitude was associated negatively with depression (Layous & Lyubomirsky, 2014).

One meta-analysis met inclusion criteria. Robson, Allen & Howard (2020) found a negative association between the Strength of self-regulation and externalising behaviours, with a small to medium effect size (-.34).

4. Discussion

The aim of this scoping review was to look at the breadth of existing literature on the relationship between the PERMA components and children's mental health, resilience and wellbeing. From the 190 included studies, it is clear that some elements of PERMA have been widely researched and connected with the outcomes, while some have not. The characteristics of the included studies demonstrated there was an increase in studies after 2011, which aligns with the release of Seligman's first publication of the PERMA framework. This work has been completed in a wide variety of nations, with 36 different countries represented across the studies, demonstrating the broad influence PERMA has had. As anticipated, the work in this area with children has largely been in school settings. The majority of studies were of high quality, which gives confidence to the findings presented.

The overwhelming majority of studies reported relationships between the PERMA components and Strengths in the expected direction with mental health, resilience and wellbeing. For correlational studies, both cross-sectional and longitudinal, positive and significant relationships were found between the components and wellbeing and resilience, and negative relationship with mental illness and symptoms. These relationships ranged from small to large Pearson's correlations (.1 to .8). Qualitative and case studies tended to explain the PERMA components as either protective factors or factors that contribute to greater positive mental health, resilience and wellbeing. Interventions were less consistent, however in nearly all interventions one of the desired outcomes was achieved. The frameworks, models and reviews suggested that wider literature supports these relationships and that the findings are consistent.

4.1 Positive Emotions

Positive Emotions were found to relate to the outcomes in a variety of ways, such as through optimism, smiling and laughter, and identifying Strengths (Ey et al., 2005; Finch et al., 2020; Keyfitz et al., 2013; Lengua, 2003; Mohangi et al., 2011; Park, 2004; Pienaar et al., 2011; Schlechter, 2019; Veronese et al., 2012). This is consistent with previous theory, such as the broaden and build theory (Fredrickson, 2001). This theory suggests that when individual's experience positive emotions, it broadens the range of present moment thought-action responses that they have, and as this is repeated, builds resources that they will continue to use (Fredrickson, 2001), leading to improvement in the outcomes identified.

4.2 Engagement

Several elements of PERMA were underrepresented in the studies, such as Engagement. When it was included, Engagement was often measured in terms of classroom engagement, thus not fully representing Engagement as defined in PERMA. Flow is likely to be experienced by children in activities they choose to do for enjoyment, such as sports or arts (Shernoff, 2013). While children may at times experience a flow state in the classroom it is highly likely that only measuring classroom engagement has not captured this element. Linh et al. (2021) recognised engagement in fun and interesting activities as a thematic outcome associated with life satisfaction, which was the only study to consider Engagement in this way.

4.3 Relationships

The Positive Relationships aspect of PERMA was the most widely researched of the five. It was found in a very large number of studies, and with a wide array of relationship types (parents, step-parents, foster/adoptive parents, peers, teachers, mentors, grandparents, neighbours,

community, religious organisation, support groups, etc.). Relationships with parents were consistently the most impactful in terms of the outcomes, though peers, teachers and others also contributed to improved mental health outcomes. Relationships with parents and carers was strikingly common amongst the literature, suggesting this is a particularly important relationship. This is in line with the broader literature on parent-child relationships, such as attachment theory (Ainsworth, 1979; Bowlby, 1956), which highlights the importance of this relationship from infancy for future outcomes.

An Important finding was that family environment, but not family structure, was associated with mental health problems (Hakvoort et al., 2011). This study looked at single-mother, non-residential father and step-father families and found no differences on children's psychosocial outcomes based on family type. This suggests that it is not necessarily the make-up of people in a child's home (e.g., single, step, foster families) that impact their mental health, but the quality of relationship the child has with their caregivers.

One unexpected finding was that in girls but not boys, peer connectedness was positively associated with anxiety (that is, higher connection with peers was related to greater anxiety) (Guhn et al., 2013). It has been suggested that girls have a larger focus on friendships, with which comes increased worry about peer status, social approval and abandonment (Rose & Rudolph, 2006). This could potentially explain why increased connection contributes to anxiety for this group.

In intervention studies, such as the Together at School, which focused on relationships and social-emotion skills, it was found to be effective only with 3rd grade students and not 1st grade students (Kiviruusu et al., 2016). This presents the issue that PERMA components may have different impacts based on age. Some research has been done in this area. For example, it has been suggested that concepts like gratitude do not develop until 10-years-old, while others have found that gratitude relates to happiness from 5-years-old if it is domain specific (Nguyen & Gordon, 2019). Further research is needed in age differences in PERMA.

4.4 Meaning

Meaning was scarcely found in the literature. This is surprising considering the ties it has to eudaimonic and Ryff's psychological wellbeing. When Meaning was found in the review, it was strongly tied to resilience and wellbeing.

4.5 Achievement

Achievement was found to have a non-significant relationship with resilience and mental health in several cases, or even a negative relationship (Im & Kim, 2012; Pedersen et al., 2019; Somchit & Sriyaporn, 2004). This was not consistent, however, and some studies reported positive relationships between Achievement and the outcomes.

Previous literature on adolescents has found that personal standards significantly predict academic achievement, and that as these standards increase, depression decreases (Accordino et al., 2001). When standards were not met, however, this was when levels of depression increased. These findings support the notion that the desire to achieve (e.g., personal standards) is related to improvements, but also hints that the negative relationship observed between mental health and achievement could be somewhat explained by personality differences, such as perfectionism.

Interestingly, in nearly all of the studies which had a measure of achievement, grades or academic achievement was used. This does not capture the essence of the Achievement component of PERMA; a *sense* of achievement or *experience* of accomplishment might be a better way to measure this facet. There is no guarantee that children who receive high grades actually

view this as an achievement, or they may be other factors contributing to this (such as external pressure). The very few studies that reported the relationship between Achievement and wellbeing did, however, typically suggest that greater achievement was related to greater wellbeing. One qualitative paper suggested that 'achieving desired goals' was a theme relating to life satisfaction (Linh et al., 2021), pointing to the relationship between these two elements and indicating a connection with hope.

4.6 Strengths

Hope was the most frequently occurring Strength throughout the studies and was consistently associated with a plethora of measures of all three outcomes. In the case study of a child with cystic fibrosis, his deteriorating condition improved when he had a goal to look forward to, re-establishing hope (Anbar & Murthy, 2010). In Snyder's (2000, p. 185) handbook of hope theory, he expresses that "Even in the face of unimaginably bad conditions, they [children] frequently can continue to dream of a better future". This observation draws obvious parallels with resilience, which could explain the very strong relationship hope appeared to have with wellbeing, resilience and mental health in all studies in which it was included in this review. This is supported by Mullin's (2019) review, where they summarise that individuals with higher levels of hope respond better to life stressors.

Cheng et al. (2015) presented an alternative view of the relationship between creativity and resilience, based on how creativity is understood in China, suggesting that creativity and resilience are understood as similar constructs. This points to the existence of cultural differences between the PERMA components, suggesting that PERMA may impact children differently around the world. The cultural impact on PERMA is an area that has not been well explored.

Of the 24-character strengths, many were represented minimally or not at all in the literature. Overall, however, Strengths do seem to have a positive relationship with children's mental health, resilience and wellbeing.

4.7 Limitations

One of the limitations of the study was that a large number of constructs were involved, many of which do not have definitions that are entirely agreed upon. This in itself is one of the challenges in this area, and for this study meant that not all possible synonyms were included in the search strategy. While future studies can hone in on specific constructs and clarify definitions, the purpose of this study was to demonstrate what evidence exists in this area rather than address semantic discrepancies. Due to feasibility, only English language articles were considered, which limited the studies, given that culture may impact the concepts and the outcomes (e.g., Cheng et al., 2015). In order to ensure quality, only peer-reviewed articles were considered. This does, however, mean that no grey literature was searched, which is a limitation. Furthermore, educational databases may have provided further studies not found in the databases searched. The reason for their exclusion is discussed in the Methods, but this is a potential limitation. Due to the large number of studies the search returned, one reviewer instead of two performed the screening, data extraction, and quality appraisal processes. In order to ensure decisions were consistent and could be replicated, a strict piloting process was employed instead (see Methods). The pilot screening process was informed by PRISMA and JBI recommendations and the screening process, including changes, was transparently reported.

4.8 Future directions

The outcomes suggest that there are established relationships between the PERMA components and Character Strengths, and wellbeing, resilience and mental health. Much of this work has been done in the school context and implies there is scope for these to be applied in prevention and intervention programs. Applying these principles in school-based intervention programs could allow schools to bolster positive mental health in students.

While the types of studies were diverse, there has been very little synthesis of knowledge in this area. The majority of the reviews included were summaries of the literature, and only one meta-analysis was found (which focused only on self-regulation). Despite this, a large number of correlational studies exist. One reason for the lack of systematic reviews and meta-analysis may be due to the inconsistency in measures. There is little to no consensus on the best used measures for the concepts included, for PERMA components and the outcomes alike. In some areas, meta-analysis would be possible and would be beneficial in contributing to the understanding of PERMA's impact. As mentioned, however, more consistency is needed in how the constructs are measured before this can occur.

As previously suggested, Engagement, Meaning and some Strengths were scarcely represented in the literature but have promising findings. Furthermore, due to the inconsistencies in both Achievement and Engagement and limited sources of measurement (academic/grades only or classroom engagement) these areas would benefit from further focus. Cultural and age differences in how PERMA is experienced are other potential avenues that could be explored.

PERMA is one perspective of wellbeing, but other models exist, as discussed. Future work could look at children's mental health and resilience in the context of other models, such as hedonistic and eudaimonic perspectives.

5. Conclusions

In view of the objective of this paper, to establish the relationship between PERMA and primary-school aged children's mental health, wellbeing and resilience, it appears that PERMA has an important relationship with these outcomes. There is considerable evidence that the elements of PERMA, including Strengths, contribute to greater wellbeing and resilience, and are a protective factor against mental illness. There are gaps in this field that require attention, as outlined, but the implications of this work can be applied in clinical, educational, community and family contexts. Based on the findings, there is scope to suggest that PERMA components and some Strengths could be of relevance for mental ill-health intervention and prevention in primary school-aged children. The implications of this work can also contribute to future research in the areas of school, developmental, community and counselling psychology. Ultimately, these findings are of importance for those invested in the present and future flourishing of children and offers significant opportunity for protecting children against mental illness.

Conflict of interest statement

The authors report no conflicts of interest.

Data availability statement

N/A.

Author contributions statement

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Jasmine Turner. The first draft of the manuscript was written by Jasmine

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Appendix A

Table A.1. Search strategy for PsycINFO

#	Searches
1	Positive psychology.sh. or Positive psychology.ti,ab. or PERMA.ti,ab. or Gratitude.sh. or grateful*.ti,ab. or gratitude.ti,ab. or kind*.ti,ab. or hope*.ti,ab. or appreciation.ti,ab. or brave*.ti,ab. or creative*.ti,ab. or curious*.ti,ab. or fair*.ti,ab. or forgiv*.ti,ab. or honest*.ti,ab. or humility.ti,ab. or humour.ti,ab. or humor.ti,ab. or wisdom.ti,ab. or leadership.ti,ab. or love.ti,ab. or persever*.ti,ab. or perspective.ti,ab. or prudence.ti,ab. or self regulation.ti,ab. or spirituality.ti,ab. or teamwork.ti,ab. or zest.ti,ab. or Positive Emotions.sh. or Optimism.sh. or optimism.ti,ab. or positivism.sh. or Psychological engagement.sh. or engagement.ti,ab. or flow.ti,ab. or Interpersonal relationships.sh. or Relationship quality.sh. or relationships.ti,ab. or prosocial behaviour.sh. or prosocial behaviour.ti,ab. or Meaningfulness.sh. or Meaning.sh. or meaning*.ti,ab. or Achievement.sh. or achieve*.ti,ab.
2	(Mental health or Well being).sh. or mental health.ti,ab. or mental wellbeing.ti,ab. or mental well being.ti,ab. or well being.ti,ab. or resilience.ti,ab
3	Child*.mp
4	1 and 2 and 3
5	limit 4 to (peer reviewed journal and school age)