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## Cognitive coping strategies that supported teacher resilience during the COVID-19 pandemic

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Limited research focusing on the cognitive strategies that support the resilience of teachers in a world pandemic has been conducted. By employing a sequential explanatory mixed method research design, this study was undertaken to investigate how cognitive coping strategies supported teacher resilience during the COVID-19 pandemic. For data collection/generation and capturing/documentation, an online questionnaire (Phase 1, quantitative) was completed by 240 urban school teachers, and online participatory focus groups (Phase 2, qualitative) with 24 of these respondents were facilitated. In support, observation, audio-recordings, field notes and a reflective journal augmented data generation. Descriptive and inferential statistics were used for analysis of the quantitative data, and a hybrid thematic analysis approach was followed to analyse the qualitative data. Thereafter, the quantitative and qualitative results were integrated to achieve the purpose of the study. The results from analyses included the Spearman correlation coefficient which tested a value of 0.327 ( $p$ -value = < 0.001), indicating a significant and positive correlation between problem-focused coping and resilience. Cognitive strategies indicated to support resilience included active coping, planning, suppression of competing activities, restraint coping, seeking of instrumental social support and nurturing a growth mindset. The cognitive strategies identified in this study informs good practice principles and can direct the professional training of both psychologists and educators. Future research and interventions aimed at promoting teacher resilience by employing cognitive coping strategies may be conducted based on the findings of the study.

**Keywords:** cognitive coping strategies; COVID-19; resilience; teacher resilience

### Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) had impacted various sectors of life and threatened the health of humanity to a great extent (Gupta, 2020). As a result of the disruption caused by the coronavirus disease (COVID-19) in terms of the education system (Save our Future, 2020), teachers had to immediately adapt and start providing ongoing learning experiences to school-going children by means of online and remote teaching (Sun, Tang & Zuo, 2020). In addition to most teachers not being prepared to abruptly start following such an alternative route on very short notice, many teachers had to learn to adjust to the pace of online teaching – having to account for the changing teaching environment while ensuring the use of inclusive and engaging teaching methods. These additional demands on teachers seemingly intensified (Save our Future, 2020) and added an increased number of challenges during an already challenging and uncertain time, with the possibility of increased levels of teacher stress and even burnout (International Task Force on Teachers for Education, 2020). The empirical study we report on in this article was inspired by the unprecedented challenges experienced by individuals in specifically the South African teaching profession, and how cognitive resilience supported teachers to cope with the COVID-19 pandemic.

### Literature Review

In this section, we discuss literature related to COVID-19 as a pandemic, its impact on the education sector and the subsequent challenges faced by teachers within the South African context, and finally, teacher resilience.

#### *The COVID-19 pandemic*

The first case of pneumonia caused by SARS-CoV-2 was recorded in Wuhan (China) in early December 2019 (Harapan, Itoh, Yufika, Winardi, Keam, Te, Megawati, Hayati, Wagner & Mudatsir, 2020; Lv, Luo, Estill, Liu, Ren, Wang, Wang, Zhao, Wang, Yang, Feng, Li, Liu, Zhang, Wang, Zhou, Meng, Qi, Xun, Yu & Chen, 2020). This highly contagious respiratory illness can be transmitted between people through social contact (Chen, Bi, Sun & Bonanno, 2022; Hilgeroth, 2020). Following its outbreak, the World Health Organisation (WHO) declared COVID-19 as a pandemic on 11 March 2020 (WHO, 2020a, 2020b; Yıldırım & Arslan, 2022). In addition to the physical health of individuals being threatened, their mental health was also threatened by, among other factors, the uncertainty associated with the pandemic (Lv et al., 2020).

In immediate response and as an attempt to curb the severity of the pandemic and the spread of COVID-19, governments around the globe implemented severe restrictions and took drastic measures shortly after the outbreak had occurred (Chen et al., 2022; Gundogan, 2021; Lin, Imani, Majd, Ghasemi, Griffiths, Hamilton, Hagger & Pakpour, 2020; Padmanabhanunni, Pretorius, Bouchard & Stiegler, 2023; Watkins, 2020). These included travel restrictions, mandatory wearing of masks, national lockdowns as well as the closure of

non-essential services and educational settings (Ataguba, 2020; Bhadelia, 2020; Chen et al., 2022; De Jesus, Ramachandra, Jafflin, Maliti, Daughtery, Shapiro, Howell & Jackson, 2021; Padmanabhanunni et al., 2023).

Forced and unseen changes included a changed mode of working for teachers around the globe, adjustments for people to work from home, and the provision of continued online education which may have affected the professional and personal lives of teachers (Brooks, Creely & Laletas 2022; Dinu, Dommett, Baykoca, Mehta, Everett, Foster & Byrom, 2021; Weissenfels, Klopp & Perels, 2022). All these demands and changes added to the workload of teachers within a changing education environment (Brooks et al., 2022; Dinu et al., 2021). According to the International Task Force on Teachers for Education (2020), additional and continuous demands that were placed on people in this profession intensified because of the pandemic, possibly resulting in increased levels of stress and even burnout among many teachers.

#### *Effect of COVID-19 on the South African education sector*

In response to the uncertainties and adversities associated with COVID-19, President Cyril Ramaphosa declared a national state of disaster in South Africa in terms of the Disaster Management Act on 15 March 2020 (Department of Health, Republic of South Africa, 2020). As a result, the effects of the pandemic caused a drastic transformation of the education system and a shift in learning and teaching methodologies (Corpuz, 2021; Juliana, Saffardin & Teoh, 2021). Teachers were expected to start offering remote and/or online teaching to learners, which required the reengineering and rethinking of learning and teaching strategies by teachers, and the adjustment to curriculum implementation, placing additional demands on teachers in an already uncertain time (Brooks et al., 2022; International Task Force on Teachers for Education, 2020; Naidu, 2021; Padmanabhanunni et al., 2023; Wuest & Subramaniam, 2021).

In this regard, Padmanabhanunni et al. (2023) are of the view that teachers in South Africa may have experienced higher levels of fear in response to COVID-19 when compared to studies in other countries, due to contextual factors impacting South African teachers' ability to implement safety protocols and also due to many teachers having comorbidities themselves. In general, teachers working in environments where resources were limited tended to experience burnout more often due to the demands and expectations being especially high given their circumstances (Juliana et al., 2021). To this end, Bottiani, Duran, Pas and Bradshaw (2019) report that burnout and stress

among public school teachers were even higher in the case of teachers working in urban schools. In support, Herman, Hickmon-Rosa and Reinke (2018) state that 93% of all teachers working in urban schools under normal conditions experience high levels of stress. Despite the possibility of many teachers being overwhelmed during the challenging time of the COVID-19 pandemic, teachers seemingly coped by adapting and then fulfilling the new adjusted roles as expected of them (Benight & Bandura, 2004). When considering this trend of teachers to continue supporting learners to progress and perform, it seems clear that the teachers in South Africa demonstrated varying levels of teacher resilience in coping with the challenges they faced.

#### *Teacher resilience*

When aiming to understand the psychological resilience of an individual, the quality of the adverse risk experience, its chronicity and severity, the systemic level at which it occurred, attribution to the causality as well as cultural relevance of the challenge should be considered (Ungar, 2015; Ungar & Theron, 2020). To this end, resilience can be conceptualised as a process through which the mobilisation of protective and promotive factors (personal and contextual) within socio-ecological systems takes place to sustain and improve well-being (outcome) in the face of adversity (Ebersöhn, 2017; Ungar, 2011; Ungar & Theron, 2020; Windle, 2010). Bonanno (2004) proposes that resilience in the face of potential trauma is more common than was previously believed and that unexpected and multiple pathways towards resilience exist. As such, resilience within a world pandemic implies the ability to maintain a level of good mental health; to minimise concern, depression, and anxiety; and to keep one's spirits up during challenging times (Bonanno, 2020).

According to Gu and Day (2013), teacher resilience relates to teachers' perceptions of their capacity to successfully manage inevitable uncertainties associated with being a teacher and their capacity to sustain a purposeful educational role. Consequently, teacher resilience may lead to resilience-promoting outcomes such as commitment, quality teaching, agency, and teacher well-being (Gu & Day, 2013; Mansfield, Beltman, Broadley & Weatherby-Fell, 2016). This can be achieved in the process of applying various strategies (e.g., planning) and by using personal and contextual resources (Beltman, 2020; Brooks et al., 2022; Mansfield et al., 2016). In this regard, when considering teacher resilience, the multidimensional and dynamic process of adapting in the face of adversity and within the specific socio-cultural context needs to be taken into account (Mansfield et al., 2016; Peixoto, Wosnitza, Pipa, Morgan & Cefai, 2018).

In addition, resilient teachers in general believe in their own ability (self-efficacy), feel proud about their achievements and competence, and are able to maintain strong interpersonal connections (Howard & Johnson, 2004). For Ebersöhn (2014), teacher resilience entails the process of a teacher's appraisal (Skinner & Zimmer-Gembeck, 2007) of a risk factor (based on context awareness and self-perception) and the related adaptive outcome (by coping behaviour) within the teacher's specific ecological system, in response to the stressor. Jonker (2021:60) summarises Ebersöhn's (2014) view by stating that a "resilient teacher would be able to identify and access internal and external protective resources and employ those ... in a sustained manner to mediate chronic and cumulative challenges." Within this process, resilient teachers are said to use adaptive coping strategies despite adversity (Jonker, 2021; Skinner & Zimmer-Gembeck, 2011; Willers, Potgieter, Khumalo, Malan, Mentz & Ellis, 2013).

Closely aligned, Ebersöhn (2014) argues that resilience as a process (the interaction between the risk and protective factors in the ecological and individual systems) and an outcome coincide with the typical profile of a South African teacher. As such, both protective and risk factors can affect the process of adaptation and resilience. The presence of protective factors (resilience enablers) within the working environment may lead to unpredicted, unexpected, or even better than expected positive outcomes (Ainsworth & Oldfield, 2019; Ebersöhn, 2014; Mansfield et al., 2016).

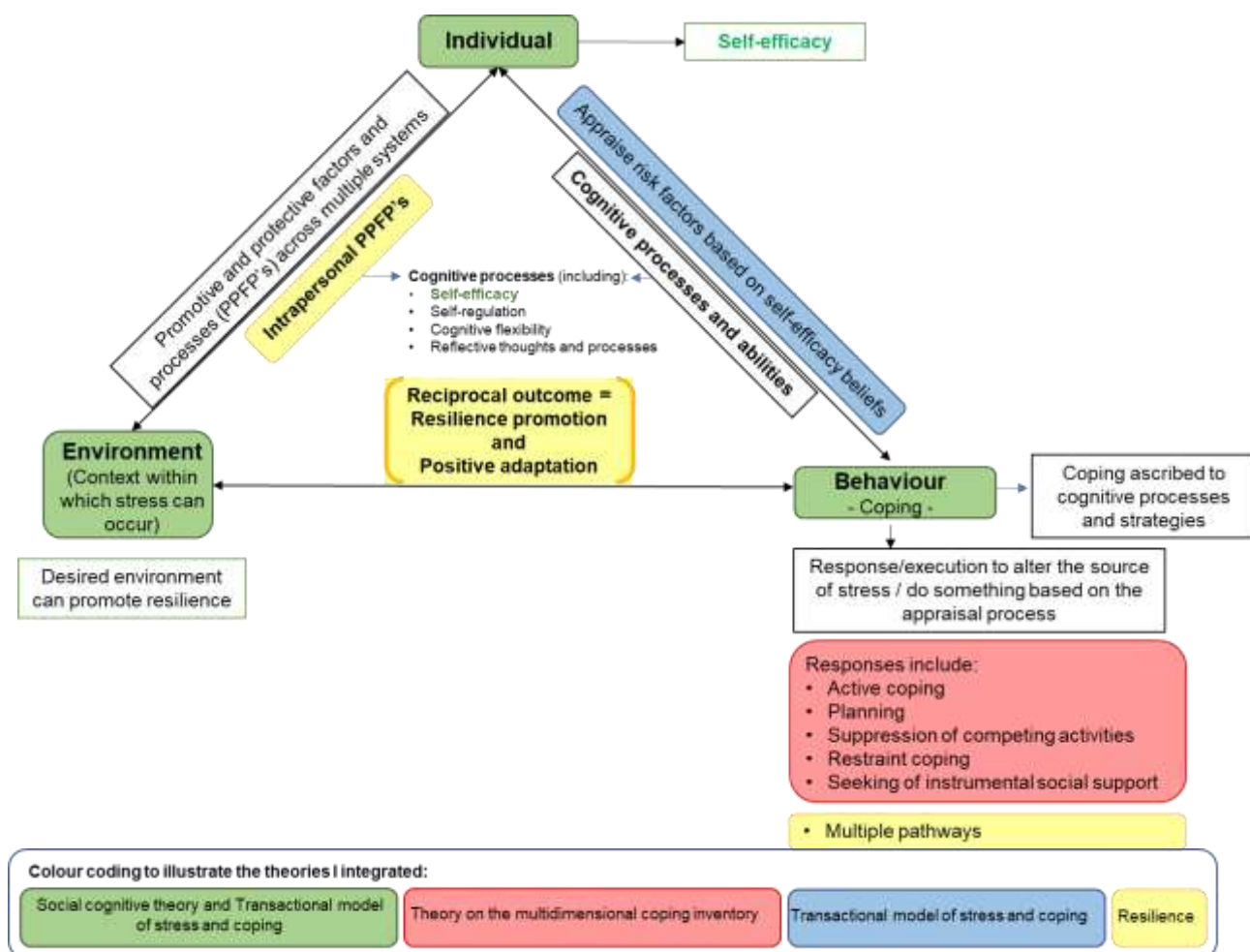
Research by Padmanabhanunni et al. (2023) indicate that resilience has played a health-sustaining role for teachers in South Africa during and following the COVID-19 pandemic. Cognitive strategies that may have been used by teachers in support of resilience include problem-focused coping, i.e., active coping, planning, suppression of competing activities, restraint coping as well as the seeking of instrumental social support and fostering meaningful connections with others (Brooks et al., 2022; Carver, Scheier & Weintraub, 1989; Juliana

et al., 2021; Lazarus & Folkman, 1984; Naidu, 2021; Padmanabhanunni et al., 2023; Riopel, 2020; Wu, Feder, Cohen, Kim, Calderon, Charney & Mathé, 2013; Wuest & Subramaniam, 2021). In addition, teachers may have cultivated a growth mindset by using various strategies such as maintaining self-efficacy, engaging in self-discovery, practicing self-care, having a positive attitude, and practicing mindfulness, religiousness as well as optimism in support of resilience (Banks, Welhaf & Srouf, 2015; Benight & Bandura, 2004; Bonanno, Romero & Klein, 2015; Brooks et al., 2022; Collie, Granziera & Martin, 2018; Conversano, Rotondo, Lensi, Della Vista, Arpone & Reda, 2010; Dweck, 2000; Howarth, Smith, Perkins-Porras & Ussher, 2019; Jacka & Berk, 2013; Jha, Morrison, Parker & Stanley, 2017; Jha, Stanley, Kiyonaga, Wong & Gelfand, 2010; Johansen, Jensen, Eriksen, Lyby, Dittrich, Holsen, Jakobsen & Øyeflaten, 2019; Mrazek, Franklin, Phillips, Baird & Schooler, 2013; Riopel, 2020; Wang, Zhang, Kong, Hong, Cheon & Liu, 2016; Wu et al., 2013; Wuest & Subramaniam, 2021).

#### Conceptual Framework

The study we report on was informed by constructs captured in resilience theory (Ungar & Theron, 2020), Social Cognitive Theory (Bandura, 1977, 1986, 1989a, 1989b, 1997), Carver et al.'s (1989) approach to assessing coping strategies as well as Lazarus and Folkman's (1984) Transactional Model of Stress and Coping. As part of the conceptual framework, the beliefs of individuals to cope with a situation or exert control over their behaviour, as part of the Theory of Stress and Coping (Carey & Forsyth, 2009; Lazarus & Folkman, 1984), are related to self-efficacy, as part of the Social Cognitive Theory (Bandura, 1977, 1986, 1989b). Additionally, the process of stress appraisal and coping relates to the construct of self-efficacy, as it aligns with the perceptions and cognition of individuals' ability to respond to challenges, and consequently, to cope with them.

The conceptual framework is presented in Figure 1.



**Figure 1** Conceptual framework of the study

Coping was assessed by using the COPE Inventory; a multidimensional coping inventory to assess individuals' responses to stress in order to cope (Carver, 2013; Carver et al., 1989). The apparent reciprocal relationship between the behaviour of individuals and their environments may result in the possibility to effect change by means of cognitive processes and by using cognitive strategies (Bandura, 1977, 1986, 1989b). These cognitive strategies may include, among others, active coping, planning, suppression of competing activities, restraint coping and seeking instrumental social support (Carver et al., 1989) and can be regarded as personal and relational capacities, or as multiple pathways that can facilitate resilience (Bonanno, 2020; Ungar & Theron, 2020). By promoting resilience through the aforementioned cognitive strategies, individuals' ability to appraise a threat and address challenges may improve and their cognitive functioning enhanced, in support of resilience (Baum, Stokar, Ginat-Frolich, Ziv, Abu-Jufar, Cardozo, Pat-Horenczyk & Brom, 2018; Dutcher & Creswell, 2018; Golonka, Mojsa-Kaja, Popiel, Marek & Gawlowska, 2017; Michel, 2016).

As such, protective factors that may maintain and promote resilience include self-efficacy, self-regulation, cognitive flexibility, and reflective thought processes (Benight & Bandura, 2004; Chen & Bonanno, 2020; Masten, 2014, 2019; Ungar & Theron, 2020); all of which are related to cognitive strategies. Positive outcomes when these strategies are employed are consequently associated with adaptive responses and coping through multiple pathways to support resilience (Bonanno, 2004, 2020; Coetzee, Ebersöhn, Ferreira & Moen, 2017; Masten, 2001; Skinner & Zimmer-Gembeck, 2011; Ungar & Theron, 2020).

### Methodology

We followed a mixed methods methodological approach, anchored in pragmatism as epistemological paradigm in this study. The primary research question that guided this study was the following: How did cognitive resilience support teachers to cope with the COVID-19 world pandemic? In support, secondary research questions focused on the cognitive strategies that were used by teachers in South Africa in response to the challenges implied by the pandemic,

correlations between the strategies and teacher resilience in response to the challenges implied by the pandemic, teachers' experiences of the cognitive strategies implemented by them, and how insight into these cognitive strategies may inform resilience theory.

In accordance, the null hypothesis indicates that no relationship could be found between the cognitive strategies and the facilitation of teacher resilience, while the alternative hypothesis designates a relationship between the cognitive strategies and the facilitation of teacher resilience.

Ethical guidelines, including voluntary participation and informed consent, confidentiality and anonymity, respect, protection from harm, and trust were respected and adhered to throughout the research process. In addition, ethical clearance (EDU181/20) to collect, analyse and report on data were obtained prior to commencement of these processes.

#### Research Design

A sequential explanatory mixed methods design was implemented, due to the possibility of following up and elaborating on the quantitative results by relying on qualitative data when implementing this design (Creswell & Creswell, 2018; Edmonds & Kennedy, 2017; Ivankova, Creswell & Stick, 2006). As such, qualitative data (text/narrative) were generated and analysed after the collection and analysis of quantitative data (numerical) in the current study, implying two consecutive and distinct research phases (Creswell & Plano Clark, 2018; Edmonds & Kennedy, 2017; Ivankova et al., 2006; Teddlie & Tahakkori, 2009).

The decision to implement this research design thus related to the possibility of explaining certain variables (cognitive strategies and resilience) by means of quantitative and qualitative data, with these constructs being of primary interest to the study (Cohen, Manion & Morrison, 2018; Creswell & Plano Clark, 2018). In an attempt to obtain a richer understanding of the participants' experiences, we involved selected participants during the qualitative phase of data generation, where further clarification and elaboration could be obtained in terms of the participants' use of the constructs measured on the quantitative scales. In accordance with this research design, the qualitative phase of the study was dependent on and connected to the quantitative phase.

#### Sampling

Non-probability purposive sampling (Cohen, Manion & Morrison, 2007; Creswell, 2012; Leedy & Ormrod, 2013; Maree, 2010; Mertens, 2014; Mouton, 2001; Teddlie & Tashakkori, 2009) was used to select 240 respondents for the quantitative phase of the study. The principals of primary and secondary schools from the respective districts

where ethical clearance had been obtained were contacted. Hereafter, the teachers at the respective schools from which permission was obtained were contacted for voluntary participation in the research. Through purposive sampling, key teacher informants could be strategically and purposely selected who could potentially yield in-depth data related to the research questions, with the participants all having experienced the phenomenon under investigation (Mertens, 2014; Teddlie & Tashakkori, 2009).

Selection criteria for participation included that the participating teachers had to provide informed consent and were willing to participate; teachers had to be involved in teaching at a urban or semi-urban primary or secondary school in Tshwane (South Africa), teachers had to have internet connection and access to a mobile/electronic device for completion of an online questionnaire and participation in virtual follow-up focus groups, and teachers had to be proficient in either Afrikaans (one of the official languages of South Africa, spoken by approximately 13% of the population) or English, being the languages that we are proficient in.

Teacher participants who, during the first phase of data collection, indicated their willingness to participate in a follow-up phase, were subsequently contacted for the second phase of the study. To be more specific, these participants had to provide informed consent as well as their contact email addresses in response to a question included in the online questionnaire during the first phase of the study, indicating their willingness to participate in the second phase. During the second phase of the study, 24 participants took part in online participatory focus groups.

#### Data Collection/Generation

During the first phase of the research, quantitative data were collected, captured and analysed. For this purpose, all of the items of two existing instruments, being the COPE Inventory (Carver, 2013) and Adult Resilience Measure-Revised (ARM-R) (Resilience Research Centre, 2018) were compiled into one online questionnaire. In addition, questions related to biographical data were added. The COPE Inventory can be described as a multidimensional coping inventory that directs the evaluation of different ways in which people respond to adverse circumstances and stress (Carver et al., 1989), while the ARM-R is a self-reporting instrument measuring social-ecological resilience (Resilience Research Centre, 2018). Quantitative (numerical) data were electronically captured by the respondents as part of the quantitative data collection phase during the completion of the online questionnaire.

Coefficient of reliability testing (internal consistency) was conducted, which indicated

moderate to high internal consistency within these measurement instruments. For personal resilience (as part of the ARM-R) the Cronbach alpha was 0.846 and for relational resilience (as part of the ARM-R), the Cronbach alpha was 0.835 (Resilience Research Centre, 2018). For the scales of the COPE Inventory (Carver, 2013), the Cronbach alpha for each of the scales is presented in Table 1.

**Table 1** Internal consistency of the COPE inventory

Scale	Cronbach alpha	Internal consistency
Active coping	0.96	Excellent
Planning	0.982	Excellent
Suppression of competing activities	0.952	Excellent
Restraint coping	0.953	Excellent
Seeking of instrumental social support	0.845	Good
Positive reinterpretation and growth	0.948	Excellent
Use of emotional social support	0.942	Excellent
Acceptance	0.965	Excellent
Denial	0.921	Excellent
Religious coping	0.963	Excellent
Mental disengagement	0.986	Excellent
Focus on and venting of emotions	0.949	Excellent
Humour	0.984	Excellent
Behavioural disengagement	0.943	Excellent
Substance use	0.864	Good

As illustrated, a moderate to high internal consistency within the COPE Inventory and the ARM-R is confirmed by the scores presented.

During the second phase of the study, the focus fell on qualitative data generation and documentation (Creswell, Plano Clark, Guttman & Hanson, 2003; Ivankova et al., 2006). Five online participatory focus groups were facilitated, thereby conducting internet-mediated research (IMR) (Salmons, 2012), due to the access to schools being restricted at the time of data collection/generation due to the COVID-19 safety measures. Our study was conducted in conjunction with a parallel study that focused on the psychosocial skills that teachers relied on to cope with COVID-19 and the associated challenges. All data collection/generation and analysis procedures were as a result conducted alongside another researcher, however with the two studies focusing on different aspects of coping and teacher resilience.

#### Data Analysis and Interpretation

The quantitative data were analysed through statistical tests and methods in order to describe the results (descriptive statistics) and draw inferences (inferential statistics). Descriptive statistics were

used to organise, describe and simplify the data (Gravetter & Forzano, 2009), thus enhancing our understanding thereof (Maree, 2010). Nominal data (for example, teachers' internet access during the lockdown period, teachers' race, etc.) and continuous data (age) were analysed to form part of our description of the sample of teacher respondents. Additionally, we used the Spearman correlation coefficient to test the formulated hypotheses. After the significance had been determined, the correlation between the cognitive strategies employed by teachers in response to the adversities implied by the COVID-19 pandemic and resilience was investigated. To this end, we determined the direction of correlation (positive or negative) as well as the strength of the relationship (size of the correlation coefficient) (Leedy & Ormrod, 2005) between the variables (cognitive strategies and resilience). The R Project for Statistical Computing (<https://www.R-project.org/>) was used to analyse the quantitative data.

During the second phase of the study, the qualitative data were analysed by means of hybrid thematic analysis (Boyatzis, 1998; Braun & Clarke, 2022; Crabtree & Miller, 1999; Creswell & Plano Clark, 2018; Fereday & Muir-Cochrane, 2006; Maree, 2010; Mertens, 2014; Swain, 2018; Xu & Zammit, 2020). During the first deductive phase of the qualitative data analysis, we set up codes of analysis by deriving a codebook (table of analysis) from the theory described by Carver (2013) and Carver et al. (1989) to organise the text for subsequent interpretation (Crabtree & Miller, 1999; Schwandt, 2007; Swain, 2018; Van der Walt, 2012; Xu & Zammit, 2020). During the follow-up inductive phase of the analysis, we were guided by the steps outlined by Braun and Clarke (2022). The process of qualitative data analysis thus included the steps of coding across the entire data set, searching for themes, reviewing themes (creating a thematic map by producing themes, subthemes and identifying relationships between them), and defining and naming the themes (Braun & Clarke, 2022).

#### Results

The sample of respondents who took part in the first phase of the study can be described as teachers employed at urban schools in South Africa, who were teaching learners from Grades 1 to 12 at the time of data collection. Not all the teachers were teaching all of the grades, however, Grades 12, 9, 10 and 11 (in descending order) were indicated to be taught at a higher frequency than the other grades. The respondents taught a variety of subjects, including English, Afrikaans, mathematics, natural sciences, life sciences, accounting, tourism and physical sciences. Table 2 presents information on the respondents who took part in the study.

**Table 2** Information of the respondents

	Overall (N = 240)	Percentage
<b>Gender</b>		
Female	175	72.9%
Male	65	27.1%
<b>Age</b>		
Mean (SD)	41.329 (12.183)	-
Median	39	-
Range	20–67	-
<b>Ethnicity</b>		
Indian	1	0.4%
White/Caucasian	239	99.6%
<b>Number of children</b>		
One child	33	13.8%
Two children	82	34.2%
Three children	26	10.8%
Four or more children	7	2.9%
None	92	38.3%
<b>Internet access at time of field work</b>		
No	0	0.0%
Yes	240	100%
<b>Internet access during lockdown</b>		
No	7	2.9%
Yes	233	97.1%

The majority of the teachers were female (72.9%), Caucasian (99.6%) and had children (61.7%) at that time. The ages of the teachers ranged from 20 to 67 with a mean age of 41 years (standard deviation of 12 years). The teachers who had more than 25 years of experience at the time accounted for 27.1% of the sample (the largest category). All of the teachers had internet access at the time of the study and almost all of them (97.1%) had access to the internet during the COVID-19 lockdown period.

The fact that the vast majority of the respondents were white/Caucasian (99.6) and female (72.9%), points to necessity of follow-up

studies to be conducted that can aim to investigate and compare between coping tendencies of people based on gender and race. In addition, comparative research can be conducted on the effect of technological skills, internet access, as well as infrastructure when recruiting teachers working in different contexts (such as semi-urban schools) for research that is executed in an online manner. Even though it was not our intention when we started with this study, the identified cognitive strategies may be associated with the participants' demographic group in the current study, which may not specifically represent the experiences of all teachers in South Africa.

#### Quantitative Results

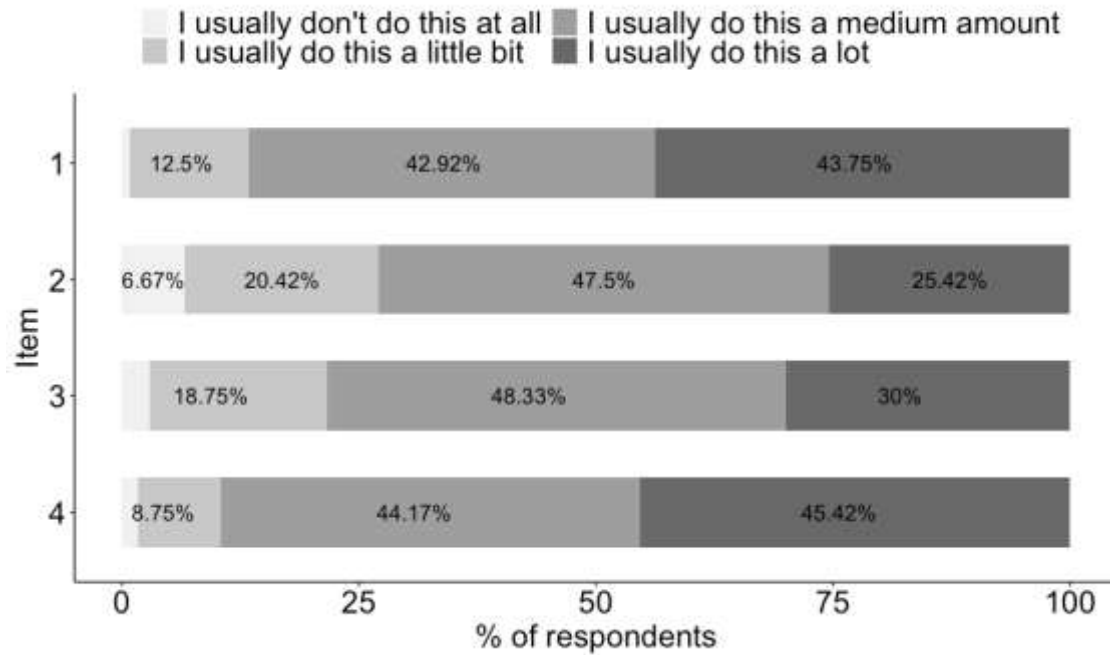
The scales measured by the COPE Inventory (Carver, 2013; Carver et al., 1989) that we focused on included problem-focused coping levels, with these being active coping, planning, suppression of competing activities, restraint coping and seeking of instrumental social support. One of these scales, active coping, is graphically included to present an example of the visualisation of the results on this scale.

#### Active coping

The items that follow are included in the active coping scale of the COPE Inventory and present possible coping strategies that may be employed when having to cope with challenges:

- 1) I concentrate my efforts on doing something about it.
- 2) I take additional action to try to get rid of the problem.
- 3) I take direct action to get around the problem.
- 4) I do what has to be done, one step at a time.

The distribution of the scores for the items in terms of the Active coping scale is displayed (cf. Figure 2).



**Figure 2** Response analysis for the active coping scale

Active coping as a cognitive coping strategy was employed more often than not by the respondents. The majority of the respondents (43.75%) indicated that they concentrated their efforts on doing something about the problem a lot of the time. Additionally, 47.5% (the majority) of the respondents took additional action to try and get rid of the problem, whereas 48.33% (the majority) took direct action to get around the problem to a medium extent of the time. Of the respondents, 45.42%, indicated that they did what had to be done, one step at a time, a lot of the time.

#### *Planning*

The respondent employed planning as a strategy to a great extent. To be specific, preparing a plan of action was employed by 55.83% of the respondents and thinking about how they might best handle the problem by 47.92%, a lot of the time. Trying to come up with a strategy about what to do was used by 45.83% of the respondents to a medium extent, with 45% of the respondents indicating that they thought hard about the steps to take when facing a challenge, to a medium extent of the time.

#### *Suppression of competing activities*

Respondents did apparently not frequently put activities aside in order to concentrate on a problem when facing one. The majority of the respondents (38.33%) indicated that they only employed this strategy to a little extent. However, for the other items included on the scale, the majority of the respondents reported that they relied on the respective strategies to a medium extent. More specifically, 46.25% of the respondents indicated

that they would keep themselves from getting distracted by other thoughts or activities, 49.58% that they would focus on dealing with the particular problem, and if necessary, let other things slide a little, and 45.83% that they would try hard to prevent other things from interfering with their efforts of dealing with the problem.

#### *Restraint coping*

The strategies of restraining oneself from doing anything too quickly (43.33%) and holding off doing anything about a problem until the situation permits (45.83%) were employed less frequently by the majority of the respondents. The strategy to “make sure not to make matters worse by acting too soon” was implemented by the majority of the respondents (38.75%) to a medium extent, with another substantial number of respondents (30.83%) relying on this strategy to a little extent. In terms of the last item of this scale, 47.92% of the respondents indicated that they forced themselves to wait for the right time to do something about a problem, a lot of the time.

#### *Seeking instrumental social support*

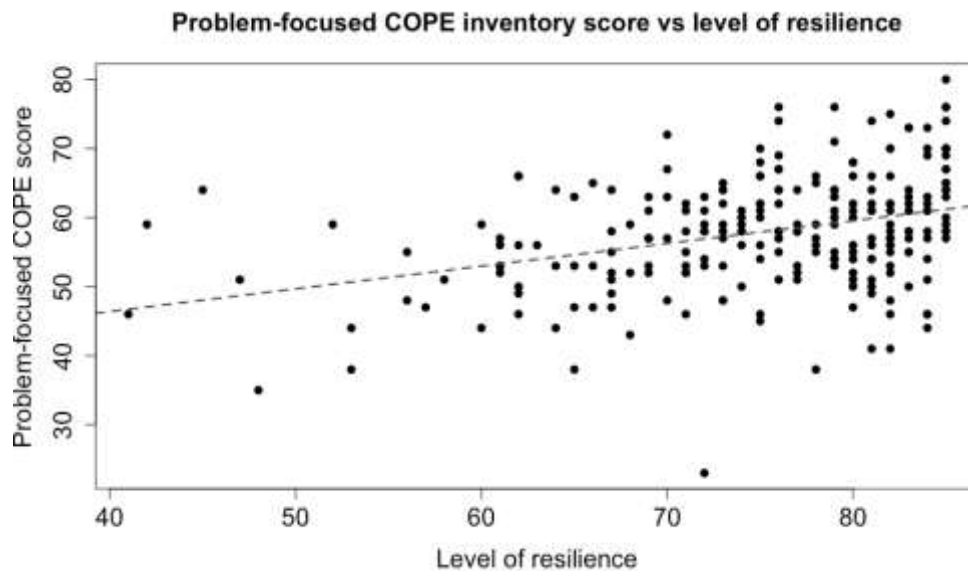
The respondents employed strategies related to the seeking of instrumental social support more frequently than not, when responding to stress or adversity. On all four items, the majority of the respondents indicated that they tended to employ each of the four strategies (items) to a medium extent. To be more specific, 42.92% of the respondents indicated that they tried to get advice from someone else about what to do in a stressful situation, while 51.25% would talk to someone else



to find out more about the situation, 43.75% would talk to someone who could do something concrete about the problem, and 40.42% of the respondents would ask people who have had similar experiences what they had done in such a challenging situation. All of these options were relied on to a medium extent of time by the majority of the respondents.

#### Spearman correlation coefficient

The scatterplot in Figure 3 graphically illustrates the correlation between the sum of the problem-focused COPE Inventory items and the resilience score of the ARM-R. The scales of the COPE Inventory include active coping, planning, suppression of competing activities, restraint coping and the seeking of instrumental social support.



**Figure 3** Problem-focused COPE Inventory score vs level of resilience

The Spearman correlation coefficient value tested to be 0.327 ( $p$ -value = < 0.001), which indicates a positive and significant correlation between problem-focused coping and resilience. For all of these strategies, the Spearman correlation coefficient values indicate a positive and significant correlation to resilience. Based on these statistical results, we rejected the null hypothesis.

#### Qualitative Findings

The qualitative findings of our study confirm the quantitative results, and also elaborate thereon. The results indicate that teachers employed various cognitive strategies to cope with and promote resilience while facing the challenges related to the COVID-19 pandemic. Teachers adapted to changing circumstances and accepted the associated changes, acquired new skills and kept busy (active coping). Participants, for example, noted, "You do what you have to do" and "... throughout this time, we suddenly had to learn so many new skills." They maintained a routine, managed things one step at a time (stepwise method to manage the stressors) and stayed in control of what was possible for them (planning). In addition, teachers prioritised what was important

at the time (teachers engaged in prioritising activities) and consciously disengaged from competing activities and thoughts (suppression of competing activities) during their coping efforts. For example, a participant noted that "[t]o know what is now the most important, what must I give attention to and what should I rather leave to someone else to do." They reportedly accepted the situation for the time being, remained calm (restraint coping) and sought advice or information while also relying on relationships or seeking assistance from others (seeking instrumental social support). In addition, the additional inductive analysis of the data indicate that teachers' coping included the nurturing of a growth mindset by engaging in self-discovery and personal growth, drawing on reflective practices, maintaining self-care, nurturing spirituality and exercising optimism. The participants, for example, mentioned to rely on their faith and optimism by stating "that is the way in which we now cope ... I depend heavily on my faith" and "I think the most important is, even if things become difficult and even if one goes through a difficult time, you have to, as far as possible, try and stay positive."

## Discussion

The findings of this study indicate that teachers employed various cognitive coping strategies, i.e., the problem-focused strategies (Carver, 2013; Carver et al., 1989) in response to the adversities they had experienced as a result of the COVID-19 pandemic. The cognitive coping strategies identified during the first phase of the study (quantitative phase) included active coping, planning, suppression of competing activities, restraint coping and seeking out instrumental social support, as reported on as part of the quantitative results. Based on the results of the correlation test between the coping strategies and resilience, the findings indicate a relationship between the cognitive strategies employed in response to the adversities implied by the COVID-19 pandemic and teacher resilience. The second phase of the study confirmed reliance of the participants on the cognitive strategies identified during the first phase of the study. In addition, it was found that teachers used a growth mindset (engaging in self-discovery, drawing on reflective practices, maintaining self-care, nurturing spirituality and exercising optimism) as cognitive coping strategies to cope with the challenges they faced as a result of the COVID-19 pandemic.

Active coping as cognitive coping strategy refers to the active steps taken by teachers to engage in tasks of actively coping with adversities related to COVID-19. To this end, teachers thus adapted to changes by keeping themselves busy. In addition to the steps taken to alleviate or lessen the effects of stressor(s) (refer to Carver et al., 1989), the participating teachers engaged in activities that resulted in the acquisition of new skills. These findings are supported by the work of authors such as Bonanno and Mancini (2008), Bonanno et al. (2015), PeConga, Gauthier, Holloway, Walker, Rosencrans, Zoellner and Bedard-Gilligan (2020) as well as Wuest and Subramaniam (2021) who report that resilience is demonstrated when actively solving problems and doing what is necessary in the face of adversity. In such cases, active steps are taken to alleviate the effect of challenges and, as indicated by Carver et al. (1989) and Wuest and Subramaniam (2021), affect the outcome thereof.

The second cognitive coping strategy, planning, includes the thought processes that teachers may engage in to come up with strategies and steps when having to deal with a challenge. The teachers who participated implemented a stepwise method to manage the stressor(s) they experienced in relation to the adversities implied by the COVID-19 pandemic. Their efforts to maintain a routine and their endeavours to remain in control of their environment supported their planning, and ultimately their coping. In support of this finding, Yıldırım and Arslan (2022) link the ability of individuals to plan alternative routes in response to

challenges to the belief that such a situation can be controlled. Therefore, an increased sense of control over situations may facilitate coping – also mentioned by Luceño-Moreno, Talavera-Velasco, García-Albuérne and Martín-García (2020) and Thompson (2021). From the findings and the supportive literature, we derive that planning as cognitive coping strategy is dependent on the functional problem-solving skills of individuals. In support, Bonanno et al. (2015), Masten (2019) and Riopel (2020) emphasise the importance of functional problem-solving skills for the promotion of resilience.

Next, by relying on the suppression of competing activities as coping strategy, the teachers who participated seemingly tried to avoid getting distracted by other activities or thought processes that may have hindered their capacity to deal with stressor(s). As a result, the teachers engaged in prioritising activities, as an extension of the suppression of competing activities. Hence, they focused on what took priority during these challenging times, and avoided unpleasant emotional experiences, emotions and thoughts, which may have fostered their adaptation in response to the stressors they faced (Bonanno, 2004; Bonanno & Mancini, 2008). Therefore, by consciously disengaging from adverse thought processes and instead choosing to focus on constructive mental engagements, the teachers were able to increase their ability to cope with the adversities they faced as a result of COVID-19.

As part of restraint coping as cognitive strategy, the participating teachers focused on effectively dealing with the stressor(s) they faced by remaining calm and waiting for the opportune moment to present itself before taking action. They, therefore, accepted associated changes related to the adversities they faced during this time, and accommodated such changes to deal with the challenges when they were ready. Teachers did not deflect from having to cope, however they demonstrated coping by waiting for the opportune moment to take active steps within an appropriate timeline. To this end, the attitude of teachers towards change, which Sokal, Trudel and Babb (2020) regard as a critical resource in response to challenges posed by COVID-19, relate to the ability to cope. As such, we ascribe the ability of teachers to remain calm and self-regulate within adverse circumstances, to personal factors (including self-efficacy), as related to the process of resilience.

As part of the strategy to seek instrumental social support during the challenging time of the COVID-19 pandemic, the participating teachers reached out to others, not only for advice, information or instrumental assistance, but also for relational support. Teachers used instrumental support as a cognitive coping strategy by seeking

out the advice of others through various means. Bonnano (2020), Bonanno et al. (2015) and PeConga et al. (2020) similarly found that reliance on the support of others can act as a protective factor for resilience. More specifically, previous research within the context of COVID-19 indicates that the seeking out of professional guidance and practical help can act as support measure and provide a navigation tool within challenging times, such as the time of the pandemic (Brooks et al., 2022; Wuest & Subramaniam, 2021). Since resilience is seen as a product of individual and systemic factors (which for example can include colleagues, peers, friends and family), all these aspects can be regarded as important during the coping process of individuals in response to adversities such as those implied by the COVID-19 pandemic (Masten, 2001; Rosenberg, 2020).

The teachers in this study furthermore used a growth mindset as cognitive coping strategy in response to the challenges implied by the COVID-19 pandemic. In this regard, Wuest and Subramaniam (2021) state that a growth mindset can contribute to the promotion of resilience. This coping strategy can further be explained in terms of the engagement in self-discovery and the personal growth reported by the teachers who participated in this study. Correspondingly, Dweck (2000), Masten (2019) and Wuest and Subramaniam (2021) report that resilient individuals with a growth mindset will be able to harness strengths and manage challenges effectively, subsequently growing and learning from such experiences.

Closely related, in drawing from reflective practices (as part of a growth mindset), coping can be supported. As presented in existing literature, resilient individuals demonstrate a belief in their own ability (self-efficacy) to grow and learn from positive and negative experiences, which in turn can assist in managing stress and in effective decision-making (Bandura, 1997; Benight & Bandura, 2004; Benight & Cieslak, 2011; Bonanno, 2004; Carver, 1998; Howard & Johnson, 2004). Similarly, cognitive processes such as flexibility in thinking, learning by solving problems, and creativity, all of which form part of cognitive flexibility and neuro-agility, foresee resilience among individuals in response to adverse life events (Neuro-Link, 2019; Rand & Touza, 2021). Based on the findings we obtained we regard these processes as increasingly possible through employment of reflective practices by individuals during times of adversity.

The findings of this study also indicate that the participating teachers relied on the maintenance of self-care as cognitive coping strategy during their coping with the pandemic in support of their own well-being. Not only did the teachers employ these strategies (e.g. healthy eating habits, exercise, keeping balance) during the time of coping; they

seemingly also realised the importance of the continuous maintenance of self-care as important component of teacher resilience. Similar to our findings, previous studies indicate that the setting of boundaries, healthy sleeping and eating habits, stress management techniques as well as physical exercise can support resilience during adverse times (Brooks et al., 2022; Jacka & Berk, 2013; Langer & Ngnoumen, 2021; Wuest & Subramaniam, 2021).

Furthermore, the teachers that took part in this study relied on religious practices (nurturing spirituality) as coping strategy during the COVID-19 pandemic. In this regard, the teachers' value orientation acted as a cognitive mediator to facilitate coping. The teachers' perceived purpose in life and their meaning-making within the coping process seemingly contributed to the spiritual dimension of their pathway to resilience. It follows that the ability of teachers to make sense of spiritual experiences within their spiritual frameworks can be regarded as a factor that may promote resilience and foster a growth mindset, as also proposed by Du Plessis (2016). To elaborate, teachers who find meaning in their work may be better able to cope in challenging times, with this ultimately having a positive effect in terms of resilience. Baum et al. (2018) and Masten (2019) report that personal coping resources such as meaning-making and experiences of significance can be related to the occupational well-being and resilience of individuals, which can be cultivated in supportive practices at the workplace.

Finally, the teachers who participated in the study were found to view themselves as optimists and consequently employed optimism (as part of a growth mindset) as cognitive coping strategy. Therefore, they focused on remaining positive amid the adverse circumstances of the COVID-19 pandemic. Various authors report similar findings, thus relating optimism as coping strategy to resilience (refer to the work of Chen & Bonanno, 2020; Liang, Guan, Chen, Wang, Li, Xu, Li, Ai, Lu, Liang, Li & He, 2020; Robles-Bello, Sánchez-Teruel & Valencia Naranjo, 2022; Staal, Bolton, Yaroush & Bourne, 2008). Closely related, the use of cognitive strategies aimed at the nurturing of mental health is said to result in a more positive outlook (Wuest & Subramaniam, 2021). It follows that the reciprocal relationship between optimism and resilience is valuable for coping, more specifically in times of change and challenge. In this regard, we posit that optimism can be employed to facilitate a growth mindset, which will in turn enable an individual to better cope during challenging times.

Therefore, we conclude that by relying on cognitive strategies during challenging times, teachers' levels of resilience can increase. In addition, the use of cognitive coping strategies

within themselves can support the use of other coping strategies, and thereby strengthen teacher resilience. We similarly argue that teachers' reliance on cognitive coping strategies (among other employed strategies) enabled them to cope with the challenges posed by the COVID-19 pandemic, thus strengthening their own resilience and ability to cope yet also to support others to cope, such as the learners they encountered.

### Conclusion

During the initial stages of our study the COVID-19 pandemic emerged as an unprecedented threat to the lives and livelihoods of individuals across the globe. The effects of the pandemic dramatically influenced every country, city and sector, leaving people vulnerable – also those in the teaching sector, who were expected to make abrupt changes and continue with their daily responsibilities yet in an adapted and unfamiliar way. The unforeseen changes caused by the pandemic consequently compelled individuals across the globe, and specifically teachers, to find ways of coping with change in order to demonstrate resilience and continue functioning in an effective way.

With this study we specifically focused on describing how South African teachers coped and demonstrated resilience during the time of a world pandemic. We found that, not only did the teachers cope with the adversities related to COVID-19, they also displayed levels of resilience during the time. Teachers followed multiple pathways to resilience by using, among others, various cognitive strategies. The findings of our research therefore foreground the potential that lies within cognitive processes and how harnessing this potential may facilitate resilience during adverse circumstances. The findings of our study may provide ideas for future teacher guidance, inform follow-up research and practice (specifically within the educational sector) and can direct future training with regard to cognitive strategies supporting resilience.

### Authors' Contributions

The manuscript titled "Cognitive coping strategies that supported teacher resilience during the COVID-19 pandemic" was written by Elisma Williams. Elisma Williams collected and generated quantitative and qualitative data. Tanita Botha assisted with setting up the online quantitative data collection questionnaire, conducted statistical analysis of the quantitative data and provided the statistical reports. Elisma Williams conducted the thematic analysis of the qualitative data, interpreted all the results and wrote up the results and the findings. Ronél Ferreira supervised the entire research process. All authors reviewed the final manuscript.

### Notes

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### References

- Ainsworth S & Oldfield J 2019. Quantifying teacher resilience: Context matters. *Teaching and Teacher Education*, 82:117–128. <https://doi.org/10.1016/j.tate.2019.03.012>
- Ataguba JE 2020. COVID-19 pandemic, a war to be won: Understanding its economic implications for Africa. *Applied Health Economics and Health Policy*, 18(3):325–328. <https://doi.org/10.1007/s40258-020-00580-x>
- Bandura A 1977. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2):191–215. <https://doi.org/10.1037/0033-295X.84.2.191>
- Bandura A (ed.) 1986. *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura A 1989a. Human agency in social cognitive theory. *The American Psychologist*, 44(9):1175–1184. <https://doi.org/10.1037/0003-066x.44.9.1175>
- Bandura A 1989b. Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology*, 25(5):729–735. <https://doi.org/10.1037/0012-1649.25.5.729>
- Bandura A 1997. *Self-efficacy: The exercise of control*. New York, NY: W.H. Freeman.
- Banks JB, Welhaf MS & Srouf A 2015. The protective effects of brief mindfulness meditation training. *Consciousness and Cognition*, 33:277–285. <https://doi.org/10.1016/j.concog.2015.01.016>
- Baum NL, Stokar YN, Ginat-Frolich R, Ziv Y, Abu-Jufar I, Cardozo BL, Pat-Horenczyk R & Brom D 2018. Building Resilience Intervention (BRI) with teachers in Bedouin communities: From evidence informed to evidence based. *Children and Youth Services Review*, 87:186–191. <https://doi.org/10.1016/j.childyouth.2018.02.036>
- Beltman S 2020. Understanding and examining teacher resilience from multiple perspectives. In CF Mansfield (ed). *Cultivating teacher resilience: International approaches, applications and impact*. Singapore: Springer.
- Benight CC & Bandura A 2004. Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. *Behaviour Research and Therapy*, 42(10):1129–1148. <https://doi.org/10.1016/j.brat.2003.08.008>
- Benight CC & Cieslak R 2011. Cognitive factors and resilience: How self-efficacy contributes to coping with adversities. In SM Southwick, BT Litz, D Charney & MJ Friedman (eds). *Resilience and mental health: Challenges across the lifespan*. New York, NY: Cambridge University Press.
- Bhadelia N 2020. Coronavirus: Hospitals must learn from past pandemics. *Nature*, 578(7794):193. <https://doi.org/10.1038/d41586-020-00354-4>
- Bonanno GA 2004. Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *American*

- Psychologist*, 59(1):20–28.  
<https://doi.org/10.1037/0003-066X.59.1.20>
- Bonanno GA 2020. APS backgrounder series: Psychological science and COVID-19: Remaining resilient during a pandemic. *Association for Psychological Science*, 30 March. Available at [https://www.psychologicalscience.org/news/backgr\\_ounders/backgrounder-1-resilient.html](https://www.psychologicalscience.org/news/backgr_ounders/backgrounder-1-resilient.html). Accessed 12 June 2021.
- Bonanno GA & Mancini AD 2008. The human capacity to thrive in the face of potential trauma. *Pediatrics*, 121(2):369–375.  
<https://doi.org/10.1542/peds.2007-1648>
- Bonanno GA, Romero SA & Klein SI 2015. The temporal elements of psychological resilience: An integrative framework for the study of individuals, families, and communities. *Psychological Inquiry*, 26(2):139–169.  
<https://doi.org/10.1080/1047840X.2015.992677>
- Bottiani JH, Duran CAK, Pas ET & Bradshaw CP 2019. Teacher stress and burnout in urban middle schools: Associations with job demands, resources, and effective classroom practices. *Journal of School Psychology*, 77:36–51.  
<https://doi.org/10.1016/j.jsp.2019.10.002>
- Boyatzis RE 1998. *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks, CA: Sage.
- Braun V & Clarke V 2022. *Thematic analysis: A practical guide*. Thousand Oaks, CA: Sage.
- Brooks M, Creely E & Laletas S 2022. Coping through the unknown: School staff wellbeing during the COVID-19 pandemic. *International Journal of Educational Research Open*, 3:100146.  
<https://doi.org/10.1016/j.ijedro.2022.100146>
- Carey MP & Forsyth AD 2009. *Teaching tip sheet: Self-efficacy*. Available at <https://www.apa.org/pi/aids/resources/education/self-efficacy>. Accessed 2 February 2021.
- Carver CS 1998. Resilience and thriving: Issues, models, and linkages. *Journal of Social Issues*, 54(2):245–266. <https://doi.org/10.1111/j.1540-4560.1998.tb01217.x>
- Carver CS 2013. *COPE inventory: Measurement Instrument database for the social science*. Available at <https://www.midss.org/content/cope-inventory>. Accessed 28 May 2020.
- Carver CS, Scheier MF & Weintraub JK 1989. Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56(2):267–283. <https://doi.org/10.1037//0022-3514.56.2.267>
- Chen S, Bi K, Sun P & Bonanno GA 2022. Psychopathology and resilience following strict COVID-19 lockdowns in Hubei, China: Examining person- and context-level predictors for longitudinal trajectories. *American Psychologist*, 77(2):262–275.  
<https://doi.org/10.1037/amp0000958>
- Chen S & Bonanno GA 2020. Psychological adjustment during the global outbreak of COVID-19: A resilience perspective. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(S1):S51–S54.  
<https://doi.org/10.1037/tra0000685>
- Coetzee S, Ebersöhn L, Ferreira R & Moen M 2017. Disquiet voices foretelling hope: Rural teachers' resilience experiences of past and present chronic adversity. *Journal of Asian and African Studies*, 52(2):201–216.  
<https://doi.org/10.1177/0021909615570955>
- Cohen L, Manion L & Morrison K 2007. *Research methods in education* (6th ed). New York, NY: Routledge.
- Cohen L, Manion L & Morrison K 2018. *Research methods in education* (8th ed). New York, NY: Routledge.
- Collie RJ, Granziera H & Martin AJ 2018. Teachers' perceived autonomy support and adaptability: An investigation employing the job demands-resources model as relevant to workplace exhaustion, disengagement, and commitment. *Teaching and Teacher Education*, 74:125–136.  
<https://doi.org/10.1016/j.tate.2018.04.015>
- Conversano C, Rotondo A, Lensi E, Della Vista O, Arpone F & Reda MA 2010. Optimism and its impact on mental and physical well-being. *Clinical Practice & Epidemiology in Mental Health*, 6:25–29. <https://doi.org/10.2174/1745017901006010025>
- Corpuz JCG 2021. Coping with grief and loss: The role of educators during the COVID-19 pandemic. *Journal of Psychosocial Nursing and Mental Health Services*, 59(4):5.  
<https://doi.org/10.3928/02793695-20210326-02>
- Crabtree B & Miller W 1999. A template approach to text analysis: Developing and using codebooks. In BF Crabtree & WL Miller (eds). *Doing qualitative research* (2nd ed). Thousand Oaks, CA: Sage.
- Creswell JW 2012. *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed). Boston, MA: Pearson.
- Creswell JW & Creswell JD 2018. *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed). Thousand Oaks, CA: Sage.
- Creswell JW & Plano Clark VL (eds.) 2018. *Designing and conducting mixed methods research* (3rd ed). Thousand Oaks, CA: Sage.
- Creswell JW, Plano Clark VL, Guttman ML & Hanson WE 2003. Advanced mixed methods research designs. In A Tashakkori & C Teddlie (eds). *Handbook of mixed methods in social & behavioral research*. Thousand Oaks, CA: Sage.
- De Jesus M, Ramachandra SS, Jafflin Z, Maliti I, Daughtery A, Shapiro B, Howell WC & Jackson MC 2021. The environmental and social determinants of health matter in a pandemic: Predictors of COVID-19 case and death rates in New York City. *International Journal of Environmental Research and Public Health*, 18(16):8416.  
<https://doi.org/10.3390/ijerph18168416>
- Department of Health, Republic of South Africa 2020. *Statement by President Cyril Ramaphosa on measures to combat COVID-19 epidemic*. Available at <https://sacoronavirus.co.za/2020/03/15/statement-by-president-cyril-ramaphosa-on-measures-to-combat-covid-19-epidemic/>. Accessed 12 May 2020.
- Dinu LM, Dommert EJ, Baykoca A, Mehta KJ, Everett S, Foster JLH & Byrom NC 2021. A case study investigating mental wellbeing of university academics during the COVID-19 pandemic

- [Special issue]. *Education Sciences*, 11(11):702. <https://doi.org/10.3390/educsci11110702>
- Du Plessis AH 2016. Total knee replacement patients' experiences of a brief hope-based in-hospital intervention. PhD thesis. Pretoria, South Africa: University of Pretoria. Available at [https://repository.up.ac.za/bitstream/handle/2263/56932/DuPlessis\\_Total\\_2016.pdf?sequence=1&isAllowed=y](https://repository.up.ac.za/bitstream/handle/2263/56932/DuPlessis_Total_2016.pdf?sequence=1&isAllowed=y) 1. Accessed 31 October 2023.
- Dutcher JM & Creswell JD 2018. The role of brain reward pathways in stress resilience and health. *Neuroscience & Biobehavioral Reviews*, 95:559–567. <https://doi.org/10.1016/j.neubiorev.2018.10.014>
- Dweck CS 2000. *Self-theories: Their role in motivation, personality, and development*. Philadelphia, PA: Psychology Press.
- Ebersöhn L 2014. Teacher resilience: Theorizing resilience and poverty. *Teachers and Teaching*, 20(5):568–594. <https://doi.org/10.1080/13540602.2014.937960>
- Ebersöhn L 2017. A resilience, health and well-being lens for education and poverty. *South African Journal of Education*, 37(1):Art. #1392, 9 pages. <https://doi.org/10.15700/saje.v37n1a1392>
- Edmonds WA & Kennedy TD 2017. *An applied guide to research designs: Quantitative, qualitative, and mixed methods* (2nd ed). Thousand Oaks, CA: Sage.
- Fereday J & Muir-Cochrane E 2006. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 5(1):80–92. <https://doi.org/10.1177/160940690600500107>
- Golonka K, Mojsa-Kaja J, Popiel K, Marek T & Gawłowska M 2017. Neurophysiological markers of emotion processing in burnout syndrome. *Frontiers in Psychology*, 8:2155. <https://doi.org/10.3389/fpsyg.2017.02155>
- Gravetter FJ & Forzano LAB 2009. *Research methods for the behavioral sciences* (3rd ed). Boston, MA: Cengage Learning.
- Gu Q & Day C 2013. Challenges to teacher resilience: Conditions count. *British Educational Research Journal*, 39(1):22–44. <https://doi.org/10.1080/01411926.2011.623152>
- Gundogan S 2021. The mediator role of the fear of COVID-19 in the relationship between psychological resilience and life satisfaction. *Current Psychology*, 40(12):6291–6299. <https://doi.org/10.1007/s12144-021-01525-w>
- Gupta SD 2020. Coronavirus pandemic: A serious threat to humanity. *Journal of Health Management*, 22(1):1–2. <https://doi.org/10.1177/0972063420921260>
- Harapan H, Itoh N, Yufika A, Winardi W, Keam S, Te H, Megawati D, Hayati Z, Wagner AL & Mudatsir M 2020. Coronavirus disease 2019 (COVID-19): A literature review. *Journal of Infection and Public Health*, 13(5):667–673. <https://doi.org/10.1016/j.jiph.2020.03.019>
- Herman KC, Hickmon-Rosa J & Reinke WM 2018. Empirically derived profiles of teacher stress, burnout, self-efficacy, and coping and associated student outcomes. *Journal of Positive Behavior Interventions*, 20(2):90–100. <https://doi.org/10.1177/1098300717732066>
- Hilgeroth A 2020. Editorial: The coronavirus epidemic. *Medicinal Chemistry*, 16(3):271. <https://doi.org/10.2174/157340641603200226092100>
- Howard S & Johnson B 2004. Resilient teachers: Resisting stress and burnout. *Social Psychology of Education*, 7(4):399–420. <https://doi.org/10.1007/s11218-004-0975-0>
- Howarth A, Smith JG, Perkins-Porras L & Ussher M 2019. Effects of brief mindfulness-based interventions on health-related outcomes: A systematic review. *Mindfulness*, 10(10):1957–1968. <https://doi.org/10.1007/s12671-019-01163-1>
- International Task Force on Teachers for Education 2020. *Supporting teachers in back-to-school efforts: Guidelines for policy-makers*. Paris, France: United Nations Educational, Scientific and Cultural Organization. Available at <https://teachertaskforce.org/knowledge-hub/supporting-teachers-back-school-efforts-guidance-policy-makers>. Accessed 28 July 2020.
- Ivankova NV, Creswell JW & Stick SL 2006. Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, 18(1):3–20. <https://doi.org/10.1177/1525822X05282>
- Jacka FN & Berk M 2013. Depression, diet and exercise. *The Medical Journal of Australia*, 199(S6):S21–S23. <https://doi.org/10.5694/mja12.10508>
- Jha AP, Morrison AB, Parker SC & Stanley EA 2017. Practice is protective: Mindfulness training promotes cognitive resilience in high-stress cohorts [Special section]. *Mindfulness*, 8(1):46–58. <https://doi.org/10.1007/s12671-015-0465-9>
- Jha AP, Stanley EA, Kiyonaga A, Wong L & Gelfand L 2010. Examining the protective effects of mindfulness training on working memory capacity and affective experience. *Emotion*, 10(1):54–64. <https://doi.org/10.1037/a0018438>
- Johansen T, Jensen C, Eriksen HR, Lyby PS, Dittrich WH, Holsen IN, Jakobsen H & Øyeflaten I 2019. Occupational rehabilitation is associated with improvements in cognitive functioning. *Frontiers in Psychology*, 10:2233. <https://doi.org/10.3389/fpsyg.2019.02233>
- Jonker C 2021. Pre-service teacher self-efficacy and teacher efficacy in a challenged education context. PhD thesis. Pretoria, South Africa: University of Pretoria.
- Juliana A, Saffardin FS & Teoh KB 2021. Job demands-resources model and burnout among Penang preschool teachers: The mediating role of work engagement. *Annals of the Romanian Society for Cell Biology*, 25(3):6679–6691. Available at <https://www.annalsofrscb.ro/index.php/journal/article/view/2183>. Accessed 16 June 2023.
- Langer EJ & Ngnoumen CT 2021. Well-being: Mindfulness versus positive evaluation. In CR Snyder, SJ Lopez, LM Edwards & SC Marques (eds). *The Oxford handbook of positive psychology* (3rd ed). New York, NY: Oxford University Press.
- Lazarus RS & Folkman S 1984. *Stress, appraisal, and coping*. New York, NY: Springer Publishing.
- Leedy PD & Ormrod JE 2005. *Practical research: Planning and design* (8th ed). Upper Saddle River,

- NJ: Pearson Education.
- Leedy PD & Ormrod JE 2013. *Practical research: Planning and design* (10th ed). Upper Saddle River, NJ: Pearson Education.
- Liang W, Guan W, Chen R, Wang W, Li J, Xu K, Li C, Ai Q, Lu W, Liang H, Li S & He J 2020. Cancer patients in SARS-COV-2 infection: A nationwide analysis in China. *The Lancet. Oncology*, 21(3):335–337. [https://doi.org/10.1016/S1470-2045\(20\)30096-6](https://doi.org/10.1016/S1470-2045(20)30096-6)
- Lin CY, Imani V, Majd NR, Ghasemi Z, Griffiths MD, Hamilton K, Hagger MS & Pakpour AH 2020. Using an integrated social cognition model to predict COVID-19 preventive behaviours. *British Journal of Health Psychology*, 25(4):981–1005. <https://doi.org/10.1111/bjhp.12465>
- Luceño-Moreno L, Talavera-Velasco B, García-Albuérne Y & Martín-García J 2020. Symptoms of posttraumatic stress, anxiety, depression, levels of resilience and burnout in Spanish health personnel during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 17(15):5514. <https://doi.org/10.3390/ijerph17155514>
- Lv M, Luo X, Estill J, Liu Y, Ren M, Wang J, Wang Q, Zhao S, Wang X, Yang S, Feng X, Li W, Liu E, Zhang X, Wang L, Zhou Q, Meng W, Qi X, Xun Y, Yu X & Chen Y 2020. Coronavirus disease (COVID-19): A scoping review. *Eurosurveillance*, 25(15):pii=2000125. <https://doi.org/10.2807/1560-7917.ES.2020.25.15.2000125>
- Mansfield CF, Beltman S, Broadley T & Weatherby-Fell N 2016. Building resilience in teacher education: An evidenced informed framework. *Teaching and Teacher Education*, 54:77–87. <https://doi.org/10.1016/j.tate.2015.11.016>
- Maree K (ed.) 2010. *First steps in research*. Pretoria, South Africa: Van Schaik.
- Masten AS 2001. Ordinary magic: Resilience processes in development. *American Psychologist*, 56(3):227–238. <https://doi.org/10.1037/0003-066X.56.3.227>
- Masten AS 2014. Global perspectives on resilience in children and youth. *Child Development*, 85(1):6–20. <https://doi.org/10.1111/cdev.12205>
- Masten AS 2019. Resilience from a developmental systems perspective. *World Psychiatry*, 18(1):101–102. <https://doi.org/10.1002/wps.20591>
- Mertens DM 2014. *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods* (4th ed). Thousand Oaks, CA: Sage.
- Michel A 2016. *Burnout and the brain. Association for psychological science*. Available at <https://www.psychologicalscience.org/observer/burnout-and-the-brain>. Accessed 20 April 2021.
- Mouton J 2001. *How to succeed in your master's and doctoral studies*. Pretoria, South Africa: Van Schaik.
- Mrazek MD, Franklin MS, Phillips DT, Baird B & Schooler JW 2013. Mindfulness training improves working memory capacity and GRE performance while reducing mind wandering. *Psychological Science*, 24(5):776–781. <https://doi.org/10.1177/0956797612459659>
- Naidu S 2021. Building resilience in education systems post-COVID-19. *Distance Education*, 42(1):1–4. <https://doi.org/10.1080/01587919.2021.1885092>
- Neuro-Link 2019. *Neuro-agility*. Available at <https://neurolink.company/neuro-agility/>. Accessed 14 June 2020.
- Padmanabhanunni A, Pretorius TB, Bouchard JP & Stiegler N 2023. Facing your fear of COVID-19: Resilience as a protective factor against burnout in South African teachers. *Annales Médico-psychologiques, revue psychiatrique*, 181(2):119–127. <https://doi.org/10.1016/j.amp.2022.05.001>
- PeConga EK, Gauthier GM, Holloway A, Walker RSW, Rosencrans PL, Zoellner LA & Bedard-Gilligan M 2020. Resilience is spreading: Mental health within the COVID-19 pandemic. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(S1):S47–S48. <https://doi.org/10.1037/tra0000874>
- Peixoto F, Wosnitza M, Pipa J, Morgan M & Cefai C 2018. A multidimensional view on pre-service teacher resilience in Germany, Ireland, Malta and Portugal. In M Wosnitza, F Peixoto, S Beltman & CF Mansfield (eds). *Resilience in education: Concepts, contexts and connections*. Cham, Switzerland: Springer. [https://doi.org/10.1007/978-3-319-76690-4\\_5](https://doi.org/10.1007/978-3-319-76690-4_5)
- Rand KL & Touza KK 2021. Hope theory. In CR Snyder, SJ Lopez, LM Edwards & SC Marques (eds). *The Oxford handbook of positive psychology* (3rd ed). New York, NY: Oxford University Press.
- Resilience Research Centre 2018. *CYRM and ARM manual*. Halifax, Canada: Author. Available at [https://cyrm.resilienceresearch.org/files/CYRM\\_&\\_ARM-User\\_Manual.pdf](https://cyrm.resilienceresearch.org/files/CYRM_&_ARM-User_Manual.pdf). Accessed 16 April 2020.
- Riopel L 2020. *Resilience skills, factors and strategies of the resilient person*. Available at <https://positivepsychology.com/resilience-skills/>. Accessed 21 July 2021.
- Robles-Bello MA, Sánchez-Teruel D & Valencia Naranjo N 2022. Variables protecting mental health in the Spanish population affected by the COVID-19 pandemic. *Current Psychology*, 41:5640–5651. <https://doi.org/10.1007/s12144-020-01132-1>
- Rosenberg AR 2020. Cultivating deliberate resilience during the coronavirus disease 2019 pandemic. *JAMA Pediatrics*, 174(9):817–818. <https://doi.org/10.1001/jamapediatrics.2020.1436>
- Salmons J 2012. Designing and conducting research with online interviews. In J Salmons (ed). *Cases in online interview research*. Thousand Oaks, CA: Sage.
- Save our Future 2020. *Averting an education catastrophe for the world's children*. Available at [https://saveourfuture.world/wp-content/uploads/2020/10/Averting-an-Education-Catastrophe-for-the-Worlds-Children\\_SOF\\_White-Paper.pdf](https://saveourfuture.world/wp-content/uploads/2020/10/Averting-an-Education-Catastrophe-for-the-Worlds-Children_SOF_White-Paper.pdf). Accessed 13 February 2021.
- Schwandt TA 2007. *The SAGE dictionary of qualitative inquiry* (3rd ed). Thousand Oaks, CA: Sage.
- Skinner EA & Zimmer-Gembeck MJ 2007. The development of coping. *Annual Review of Psychology*, 58:119–144. <https://doi.org/10.1146/annurev.psych.58.110405.085705>

- Skinner EA & Zimmer-Gembeck MJ 2011. Perceived control and the development of coping. In S Folkman (ed). *The Oxford handbook of stress, health, and coping*. New York, NY: Oxford University Press.
- Sokal L, Trudel LE & Babb J 2020. Canadian teachers' attitudes toward change, efficacy, and burnout during the COVID-19 pandemic. *International Journal of Educational Research Open*, 1:100016. <https://doi.org/10.1016/j.ijedro.2020.100016>
- Staal MA, Bolton AE, Yaroush RA & Bourne LE, Jr 2008. Cognitive performance and resilience to stress. In BJ Lukey & V Tepe (eds). *Biobehavioral resilience to stress*. Boca Raton, FL: CRC Press.
- Sun L, Tang Y & Zuo W 2020. Coronavirus pushes education online. *Nature Materials*, 19:687. <https://doi.org/10.1038/s41563-020-0678-8>
- Swain J 2018. *A hybrid approach to thematic analysis in qualitative research: Using a practical example*. London, England: Sage. <https://doi.org/10.4135/9781526435477>
- Teddlie C & Tashakkori A 2009. *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks, CA: Sage.
- Thompson SC 2021. The role of personal control in adaptive functioning. In CR Snyder, SJ Lopez, LM Edwards & SC Marques (eds). *The Oxford handbook of positive psychology* (3rd ed). New York, NY: Oxford University Press.
- Ungar M 2011. The social ecology of resilience: Addressing contextual and cultural ambiguity of a nascent construct. *American Journal of Orthopsychiatry*, 81(1):1–17. <https://doi.org/10.1111/j.1939-0025.2010.01067.x>
- Ungar M 2015. Practitioner review: Diagnosing childhood resilience - a systemic approach to the diagnosis of adaptation in adverse social and physical ecologies. *The Journal of Child Psychology and Psychiatry*, 56(1):4–17. <https://doi.org/10.1111/jcpp.12306>
- Ungar M & Theron L 2020. Resilience and mental health: How multisystemic processes contribute to positive outcomes. *The Lancet Psychiatry*, 7(5):441–448. [https://doi.org/10.1016/S2215-0366\(19\)30434-1](https://doi.org/10.1016/S2215-0366(19)30434-1)
- Van der Walt A 2012. Die bruikbaarheid van liggaamsportrette vir kruis-kulturele loopbaanfasilitering. MEd tesis. Pretoria, Suid-Afrika: Universiteit van Pretoria. Beskikbaar te [https://repository.up.ac.za/bitstream/handle/2263/25845/Van%20der%20Walt\\_%20Bruikbaarheid\\_2012.pdf?sequence=1&isAllowed=y](https://repository.up.ac.za/bitstream/handle/2263/25845/Van%20der%20Walt_%20Bruikbaarheid_2012.pdf?sequence=1&isAllowed=y). Geraadpleeg 31 Oktober 2023.
- Wang Y, Zhang L, Kong X, Hong Y, Cheon B & Liu J 2016. Pathway to neural resilience: Self-esteem buffers against deleterious effects of poverty on the hippocampus. *Human Brain Mapping*, 37:3757–3766. <https://doi.org/10.1002/hbm.23273>
- Watkins J 2020. Preventing a covid-19 pandemic. *British Medical Journal*, 368:m810. <https://doi.org/10.1136/bmj.m810>
- Weißenfels M, Klopp E & Perels F 2022. Changes in teacher burnout and self-efficacy during the COVID-19 pandemic: Interrelations and e-learning variables related to change. *Frontiers in Education*, 6:736992. <https://doi.org/10.3389/educ.2021.736992>
- Willers M, Potgieter JC, Khumalo IP, Malan L, Mentz PJ & Ellis S 2013. Coping and cultural context: Implications for psychological health and well-being. In MP Wissing (ed). *Well-being research in South Africa*. London, England: Springer. <https://doi.org/10.1007/978-94-007-6368-5>
- Windle G 2010. What is resilience? A review and concept analysis. *Reviews in Clinical Gerontology*, 21(2):152–169. <https://doi.org/10.1017/S0959259810000420>
- World Health Organization 2020a. *Coronavirus disease 2019 (COVID-19) situation report – 51*. Available at [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200311-sitrep-51-covid-19.pdf?sfvrsn=1ba62e57\\_10](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200311-sitrep-51-covid-19.pdf?sfvrsn=1ba62e57_10). Accessed 10 August 2020.
- World Health Organization 2020b. *Rolling updates on coronavirus disease (COVID-19): Public health emergency of international concern declared*. Available at <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>. Accessed 13 August 2020.
- Wu G, Feder A, Cohen H, Kim JJ, Calderon S, Charney DS & Mathé AA 2013. Understanding resilience. *Frontiers in Behavioral Neuroscience*, 7:10. <https://doi.org/10.3389/fnbeh.2013.00010>
- Wuest DA & Subramaniam PR 2021. Building teacher resilience during a pandemic and beyond. *Strategies: A Journal for Physical and Sport Educators*, 34(5):8–12. <https://doi.org/10.1080/08924562.2021.1948476>
- Xu W & Zammit K 2020. Applying thematic analysis to education: A hybrid approach to interpreting data in practitioner research. *International Journal of Qualitative Methods*, 19:1–9. <https://doi.org/10.1177/1609406920918810>
- Yıldırım M & Arslan G 2022. Exploring the associations between resilience, dispositional hope, preventive behaviours, subjective well-being, and psychological health among adults during early stage of COVID-19. *Current Psychology*, 41(8):5712–5722. <https://doi.org/10.1007/s12144-020-01177-2>