Resilience predictors in the post-pandemic era: A study on Italian adolescents

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Abstract

Resilience is the ability to emerge strengthened from adversity. Recently, as the Covid-19 pandemic has impacted adolescents' growth processes, investigating which psychosocial variables make adolescents resilient has become essential. The aim of the study is to investigate which are the significant predictors of resilience in a sample of Italian adolescent students (N = 1266, 47% male, mean age = 14.96 years) one year after the end of the pandemic. Participants responded to a battery of tests, administered online, that included measures of: resilience, ad hoc items on meditation frequency, self-compassion, self-efficacy in managing positive and negative emotions, and coping. The results of a linear regression model revealed that the predictors of resilience in adolescents in the post-pandemic period were: frequency of meditation (β =.61, $p < .01$), self-efficacy in regulating positive and negative emotions (β =. 41, $p < .001$; β = .19, $p < .001$), self-reliance (β = .11, $p < .001$), mindfulness (β = .11, $p < .001$), low over-identification (β = -.06, $p < .05$), future perspective (β = .11,

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p < .001) and problem orientation (β = .17, p < .001). These findings emphasize the importance of cultivating these psychosocial variables to promote adolescents' resilience in the face of adversity. The implications of the present study are discussed.

Keywords: Resilience; Adolescence; Covid-19; post-pandemic period; meditation; Self-efficacy; Emotion Regulation; Self-compassion

Introduction

Resilience is "the process and outcome of successfully adapting to difficult or challenging life experiences, primarily through mental, emotional, and behavioral flexibility and adaptation to external and internal demands" (APA Dictionary of Psychology, 2022). Various definitions of resilience have proliferated in the literature, with a multiplicity of taxonomies and meanings (White & McCallum, 2021). The literature emphasizes that an adverse event can strengthen individuals' psychosocial resources, especially in terms of sociality, communication and interpersonal skills that lead to adaptation (Grotberg, 1995; Cyrulnik, 2001; Feldman, 2020) and emotional resilience (Wagnild & Young, 1990).

In this understanding of resilience, adversity becomes an opportunity to learn about one's potential, improve oneself and reprogram the future while facing a challenging situation (Connor & Davidson, 2003, Paoletti et al., 2023). Neuroscience has studied the mechanisms underlying resilience to identify strategies to support adaptive development throughout life (Hunter et al., 2018; Feldman, 2020). Resilience, specifically, can be enhanced by increasing the activation of the prefrontal cortex and coping circuits to cope with stress (Fredrickson, 1998; Davidson, 2000; Tabibnia & Radecki, 2018; Baratta & Maier, 2019). This can be achieved through psychoeducational and complementary interventions (e.g., parent and community training to reinforce positive resources, meditation and mindfulness, and aerobic exercise) across the lifespan (Hunter et al, 2018; Münch et al., 2021).

Therefore, resilience is not a static characteristic or trait, but a dynamic factor (Herrman et al., 2011). Although several theoretical models base the explanation of resilience on contextual or personal variables (e.g., Masten, 2001), individual resilience is the result of a complex interplay of resources (e.g., innate ways of being, genetic

dispositions, coping skills and contextual characteristics) (Grych et al., 2015). Given its multifaceted and dynamic nature, resilience can be trained (O'Doughterty, 2012), representing the key to improving the well-being of individuals and society (Cyrulnik, 2001; Richardson, 2002; Paoletti et al., 2022).

In the life cycle, adolescence is a crucial phase for psychosocial development, characterized by complex identity construction processes (Sadowski, ed., 2021). The individual's social horizons expand: adolescent boys and girls are no longer exclusively embedded in family dynamics, but they enter a network of relationships related to school and peer groups (Tarrant, 2002; Nickerson & Nagle, 2005; Albarello et al., 2018). Plus, in adolescence the brain undergoes significant changes (Steinberg, 2010), such as increased activity in the prefrontal cortex. This region is responsible for executive functions such as decision-making, planning, impulse control and working memory: due to the activation of the prefrontal cortex, adolescents acquire skills in sophisticated cognitive processes (e.g., abstract thinking, hypothetical reasoning) (Bolton & Hattie, 2017).

Given the neuroplasticity that characterizes this phase (Fuhrmann et al., 2015), adolescence represents the crucial time in human development to cultivate resilience as a long-term resource. Recently, the Covid-19 pandemic had a massive impact on adolescents, temporarily disrupting the balance between school routines, friendships and family life, duplicating symptoms of depression and anxiety among teenagers (Racine et al., 2021). Therefore, one year after the pandemic, it is crucial to understand which aspects of individual psychological functioning make adolescents resilient, identifying the predictors of resilience to improve through specific interventions.

Predictors of resilience in adolescence: before and after Covid-19 pandemic

Before the pandemic, several antecedents of resilience emerged in the literature. Internationally, research has pointed out that optimism and positive emotions predicted adolescents' level of resilience (Milioni et al., 2016). Family support, friendships and peer group membership were also found to be predictive of resilience (Scarf et al., 2016; van Harmelen et al., 2017). In Italy, several studies have investigated associations between resilience and other psychological variables during adolescence: resilience seems to be related to future orientation and professional identity (Fusco et al., 2019), self-efficacy (Sagone et al., 2020), the ability to use a wide range of cognitive styles (Sagone & De Caroli,

2013) and positive emotions (Sagone & Indiana, 2017). Furthermore, resilience seems to be determined by self-acceptance, personal growth, and mastery of the environment (Sagone & De Caroli, 2014).

In the context of a 'new normal' (Paoletti et al., 2022) given by the aftermath of the pandemic, research should consider a broad constellation of psychosocial variables to investigate, to understand which characteristics made adolescents resilient in the face of global health emergency challenges. Kuhlman et al. (2021) point out that adolescents better endowed with humor and cognitive reappraisal were less likely to develop psychiatric symptoms during exposure to pandemic-related stress. Moreover, Kuhlman et al. (2023) states that the ability to emotionally regulate and provide social support to others made adolescents more resilient during the pandemic.

According to previous evidence, some psychosocial factors such as emotion regulation (Mestre et al., 2017; Polizzi & Lynn, 2021), self-compassion (Neff & McGegee, 2010; Bluth et al., 2018), future perspective (O' Neill et al, 2022), coping (Davey et al., 2003; Lee et al, 2017), prosocial skills (Haroz et al., 2013; Larson & Moses, 2017), and certain behavioral habits (e.g., practicing relaxation and meditation techniques) (Waechter & Wekerle, 2015; Gomes et al., 2021) might influence the resilience of younger people. These factors could play a key role not only in restoring pre-pandemic routines, but in improving the biopsychosocial well-being of adolescents after adversities, in line with a dynamic and transformative conception of resilience (Wagnild & Young, 1990; Grotberg, 1995; Richardson, 2002; Connor & Davidson, 2003; Herrman et al., 2011).

Study Aims

The present study aims to investigate the predictors of resilience in a sample of Italian adolescent students, one year after the end of the pandemic. The predictors tested are: self-efficacy in emotion regulation, self-compassion, future planning, coping, prosociality, and frequency of meditation.

Method

Participants

The sample consists of N = 1266 adolescent students (93% Italian) whose schools participated in the research The sample includes: N = 594 males (47%), N = 653 females (51%) and N = 18 adolescents identifying as 'other' (2%). The average age is 14.96 years (min = 12, max = 19),

with N = 490 (39%) from middle schools and N = 776 (61%) from high schools. The students come from different Italian regions, with a predominance of Lazio (37%), Campania (15%) and Marche (10%).

Measures

The participants responded to online self-report questionnaires. Firstly, they answered an ad hoc item on the frequency of meditation, which asked them how often they practice it on a Likert scale (e.g., 0 = never, 1 = sometimes, as needed, 2 = regularly). Subsequently, scientifically validated instruments were administered.

The Resilience Scale-14 (RS14; Wagnild & Young, 1993; Callegari et al, 2016) was administered, consisting of 14 items on a Likert scale from 1 to 7 (1 = strongly disagree, 7 = strongly agree).

The scales of personal self-efficacy in managing negative and positive emotions (APEN/A - APEP/A; Caprara, ed., 2001) were administered. These scales consist of 15 items on a 5-point Likert scale (from 1 = not at all capable to 5 = very capable).

The Self-Compassion Scale (Neff, 2003; Veneziani et al., 2017) (SCS) was administered. The SCS presents 26 items on a Likert scale from 1 = almost never to 5 = almost always. The scale detects 6 dimensions, ordered in 3 different polarities: self-kindness to self vs self-judgment, common humanity vs isolation, mindfulness vs over-identification.

The questionnaire Coping Orientation to the Problems Experienced-New Italian Version (COPE-NVI) (Sica et al., 2008) was administered to measure two dimensions of coping (subscales "positive attitude" and "problem orientation"). The COPE-NVI consists of 24 items on a 4-point Likert scale (from 1 = "I usually don't do it" to 4 = "I almost always do it").

To measure future time perspective in adolescents, five items of the Temporal Perspective Scale (Laghi et al., 2009) were administered. The items are on a Likert scale from 1 = absolutely false to 5 = absolutely true. The Prosocial Behaviour Scale (Caprara et al., 2005) was also administered. The scale consists of 16 items on a Likert scale (from 1 = always/almost never to 5 = always/almost always).

Finally, participants were administered Marlowe Crowne's Social Desirability Scale-SF (Crowne & Marlowe). (Crowne & Marlowe, 1960; Manganelli Rattazzi et al., 2000). The scale has 9 items on a Likert scale from 1 = absolutely false to 6 = absolutely true.

Procedure

The research was conducted by the psychopedagogical team of the Research Institute for Neuroscience Education and Didactics (RINED) of Fondazione Patrizio Paoletti (FPP), in collaboration with the University of Padua, whose Ethics Committee approved the research (dossier: 2020-III/13.41.10). After providing informed consent to families, students were administered the survey in classroom (in January 2023). Based on the participating schools (lower and upper secondary schools), convenience sampling was carried out to involve students in the 13-18 age group.

Analytic Plan

In this study, a linear regression model is used to investigate the constellation of factors that predict resilience in adolescents. A block-entry of variables is used: block 1: age and frequency of meditation, block 2: self-efficacy in regulating positive and negative emotions, block 3: dimensions of the self-compassion scale, block 4: future perspective, block 5: coping as positive attitude and problem orientation, block 6: prosociality.

Results

Linear regression revealed the following statistically significant predictors of regression: frequency of meditation ($\beta = .61$, $p < .01$), self-efficacy in managing positive ($\beta = .41$, $p < .001$) and negative ($\beta = .19$, $p < .001$) emotions, self-kindness ($\beta = .11$, $p < .001$), mindfulness ($\beta = .11$, $p < .001$), low over-identification ($\beta = -.06$, $p < .05$), future perspective ($\beta = .11$, $p < .001$), problem orientation ($\beta = .17$, $p < .001$). This model explains 49% of the variance ($R2 = .49$) (Table 1).

Tab. 1 - *Predictors of resilience in adolescence: a linear regression model*

	Unstandardized coefficients		Standardized coefficients	t	p
	B	Standard Error	Beta		
Constant	22,465	2,631		8,539	,000
Age	,159	,115	,029	1,374	,170
Frequency of meditation	1,291	,437	,061	2,952	,003
Self-efficacy (Negative emotions)	,343	,048	,192	7,101	,000

Self-efficacy (Positive emotions)	,889	,054	,405	16,508	,000
Self-kindness	1,318	,323	,108	4,076	,000
Self-judgment	,131	,372	,010	,353	,724
Common-humanity	-,270	,319	-,021	-,848	,397
Isolation	-,626	,337	-,054	-1,856	,064
Mindfulness	1,467	,352	,112	4,168	,000
Over-identification	-,807	,379	-,063	-2,128	,034
Future perspective	,266	,069	,103	3,869	,000
Positive attitude	-,059	,055	-,045	-1,078	,281
Problem orientation	,219	,051	,170	4,320	,000
Prosociality	-,029	,023	-,041	-1,255	,210
Social desiderability	-,065	,038	-,051	-1,727	,084

Discussion

After the Covid-19 pandemic, the predictors of resilience in adolescents were found to be frequency of meditation, self-efficacy in managing emotions (both negative and positive), three dimensions of self-compassion (e.g., self-kindness, mindfulness, low over-identification), future perspective and problem-oriented coping.

As highlighted by previous findings on transcendental meditation and adaptive behaviour in adolescence (Gomes et al., 2021), and meditation and post-traumatic experiences in adolescence (Waechter & Wekerle, 2015), meditation represents a resource that promotes resilience in a life stage characterized by change and transition (Erikson, 1955; Marcia, 1968). By enhancing coping (Smith & Womack, 1987), emotional regulation (Broderick et al., 2012), cognitive flexibility (Moore & Malinowski, 2009), neuroplasticity (Davidson & Lutz, 2008) and self-esteem (Wisner et al., 2010), frequent meditation predisposes adolescents to interpret adversities as opportunities (Grotberg, 1995; Herrman et al., 2011). Simultaneously, self-efficacy in managing emotions seems to predict adolescents' resilience (Bandura, 1994; Caprara et al., 2008). Perceiving oneself as capable of managing negative emotions allows children to avoid being overwhelmed by anger,

irritation and distress (Bandura et al., 2003; Caprara et al., 2008). Conversely, perceiving oneself as being able to manage positive emotions involves maximizing enjoyment, enthusiasm, and pride regardless of contexts ((Bandura et al., 2003; Caprara et al., 2008).

In this study, adolescents who are able to manage their emotions are more likely to be resilient. This finding is in line with a recent literature review (Polizzi & Lynn, 2021), which pointed out that multiple studies demonstrate the longitudinal link between emotional regulation and resilience, although different levels of resilience are associated with different emotional regulation strategies, emotion intensity and context. Furthermore, the result aligns with Mestre et al.'s (2017) study, which found the association between emotional regulation and resilience prior to the Covid-19 pandemic. It can be observed that, in two different samples (i.e., Italian and Spanish) and in two different eras (i.e., before and after the global health emergency), emotion regulation continues to be a key factor for adolescents' resilience. In a period of identity construction and neurocognitive maturation (Crone, 2018), regardless of the cultural-historical context, perceiving oneself as capable of regulating one's emotions is not only an indispensable component of social skills (Saarni, 1999), but also a fundamental tool for better and stronger outcomes from adversity (Grotberg, 1995; Cyrulnik, 2001; Richardson, 2002; Herrman et al., 2011).

Self-compassion's dimensions also resulted linked to resilience in adolescents. Self-compassion is the attitude that drives human beings to be sympathetic towards themselves even in the face of failure (Neff, 2003). The results of this study reveal three dimensions of self-compassion that predict adolescents' resilience: self-kindness, mindfulness and low over-identification. As theorized by Neff (2003), self-compassion involves treating oneself with acceptance, attention and support, even in times of difficulty. In the context of Neff's (2003) self-compassion, mindfulness implies being aware of one's experiences in the present moment, observing one's thoughts, emotions, and feelings without getting carried away by them or repressing them. In contrast, Neff (2003) describes over-identification as a cognitive and emotional tendency in which individuals become overly absorbed or fused with their thoughts, emotions, or negative self-perceptions. These findings, aligned with previous studies on the relationship between self-compassion and resilience (Neff & McGehee, 2010; Bluth et al, 2018; Yarnell & Neff, 2013), highlight that adolescents' social-emotional well-being in the post-pandemic period is related to their ability to treat themselves with kindness as they would treat friends (Neff & McGehee, 2010) and to disengage from self-judgment and cognitive dimensions of

experiences (Thompson et al, 2011) by placing themselves in a state of neutral observation (Bluth & Blanton, 2014). The findings are also in line with previous qualitative evidence (Silk et al., 2022; Perasso et al., 2023a; Perasso et al., 2023b) stating that the pandemic period constituted a time of heightened self-awareness and personal growth for teens, who were able to engage in their passions, relational and inner worlds, beyond self-judgement and school performance.

Future time perspective also turns out to be a predictor of resilience for adolescents. This result is in line with a recent structural equation model (O'Neill et al., 2020), in which future perspective, in adults, is part of a constellation of resilience antecedents. In Zimbardo and Boyd's (1999) theory, the future perspective allows people to focus on long-term goals, to plan, to delay gratification, believing in their own agenticity in shaping their individual future. According to Mello and Worrell (2014), adolescence is a crucial period for the development of a temporal perception that allows people to think about school, work, physical conditions and risk behaviour in the short and long term. This variable is closely linked to motivation (Lens et al., 2012) and the opportunity to build and adapt one's career in the work environment (Jia et al., 2022). As the future perspective appears to predict resilience in adolescents in the post-pandemic, it is possible to hypothesize that for many adolescents the pandemic represented a respite from the stresses of contemporary lifestyles (Silk et al., 2022; Perasso et al., 2023a; Perasso et al., 2023b), offering a special time to focus on oneself, engage in creative and healthy activities, and orientate oneself with respect to the future.

As highlighted by literature (Compas, 1998), children and adolescents with stronger coping skills deal better with stress, and are more resilient (Davey et al., 2003). In this study, the coping strategy that appears to be a predictor of resilience is problem-oriented coping. Problem-oriented coping consists of actively addressing and managing the stressor or problem itself, rather than focusing on emotional reactions or avoidance: it involves taking practical steps to solve the problem and reduce its impact (Skinner et al., 2003). Consistent with the findings of Lee et al.'s (2017) study, which showed that problem-oriented coping predicts resilience, the current study suggests that adolescents using this coping strategy have a proactive mindset. In accordance with more recent research (Silk et al., 2022; Perasso et al., 2023a; Perasso et al., 2023b), it is possible to hypothesize that the pandemic may have represented a crucial but challenging time for younger adolescents to increase individual coping with stress, with an increased awareness of their own resources and strengths.

Limits and Future Directions

The study presents methodological limitations. The use of self-report questionnaires (Dicken, 1963) may have favored a social desirability bias, with a lack of spontaneity in participants' responses. Therefore, future studies could supplement quantitative methodology with qualitative measures. Plus, the present study does not present an in-depth analysis of adolescents' socio-anagraphic characteristics, personality traits and backgrounds that might influence their resilience levels (Finklestein et al., 2022; Iimura & Taku, 2018). Future studies could expand in this direction the investigation the constellation of factors associated with resilience in adolescents. A further limitation is the lack of data on predictors of resilience, in this same sample, prior to the Covid-19 pandemic. For reasons of historical contingencies, therefore, a longitudinal monitoring of the impact of the investigated factors on resilience was not possible.

Based on the analysis of factors predicting resilience, future studies should focus on the importance of developing interdisciplinary approaches underlying the implementation of this variable. As already pointed out, resilience is a plastic factor (Hunter et al., 2018; Feldman, 2020) that can be cultivated through specific training, both direct and indirect, to strengthen individuals' positive resources (Hunter et al., 2018; Münch et al., 2020). To address the global decline in mental and physical health and well-being among young people as a consequence of the pandemic (Meherali et al., 2021), resilience should be promoted and embedded in educational environments. In particular, it could be useful to promote in schools the knowledge of the functioning of the resilient brain and its enhancement through ad hoc teaching (such as the practice of silence and mindfulness, training in emotion management, cognitive reappraisal of experience). This practice could fortify the whole community, moving towards a greater awareness of human interconnectedness to overcome adversity, overcoming the risk of developing an ego-centered resilience that reinforces, instead, a sense of social alienation (Paoletti et al., 2022). Indeed, meditative and mindfulness techniques, physical exercise and psycho-educational interventions that stimulate cognitive reappraisal, optimism and executive functions (inhibitory control, planning, problem solving, attention and emotional regulation) are increasingly studied (Greenberg, 2006). In this framework, the "Envisioning the Future" (EF) programme and the "10 Keys to Resilience" (Paoletti, et al., 2023; Perasso et al., 2023a, 2023b; Di Giuseppe et al., 2023a, 2023b) are a practical example of teaching to implement positive resources for prevention, and the

management of adversities and emergencies related stress. Using an interdisciplinary neuropsychopedagogical approach, EF combines theoretical and practical principles to enhance resilient brain functioning in adolescents by harnessing neuroplasticity and increased prefrontal cortex activity in this life stage (Steinberg, 2010; Fuhrmann et al., 2015; Bolton & Hattie, 2017), using the 'Sphere Model of Consciousness' (Paoletti & Ben Soussan, 2019) as a unifying theory. Indeed, this interdisciplinary theoretical approach could open new perspectives for understanding and promoting resilience in adolescents, turning adversity into opportunities for personal and collective growth, as demonstrated by applications in emergency and challenge contexts (Paoletti et al., 2023a; Paoletti et al., 2023b; Di Giuseppe et al., 2022, 2023a, 2023b; Perasso et al., 2023a,2023b).

Conclusion

The present study analyzed the predictors of resilience in a sample of Italian adolescent students, one year after the Covid-19 pandemic. Results revealed that frequency of meditation, self-efficacy in emotional regulation, self-kindness, mindfulness, low hyper-identification, future perspective and problem-oriented coping are predictors of resilience. Meditation can support stress management, emotional regulation and coping, increasing the resilience of individuals. Self-efficacy in managing emotions plays a key role in adolescents' resilience, as it allows them not to be overwhelmed by negative emotions and to maximize the positive ones, even in the face of adversity. Furthermore, self-compassion, which includes kindness towards oneself, mindfulness, and a low level of over-identification, is associated with resilience, as it predisposes individuals to greater acceptance of themselves and, possibly, their mistakes. Finally, the ability of young people to look to the future gives them greater resilience to cope with difficulties and to come out better. From a dynamic and resilience-developing perspective, the findings may have important implications for psychologists, teachers, educators, and institutions, raising awareness of the importance of integrating resilience training and related variables into the school curricula of adolescents.

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