

# Effects of perceived stress, resilience, and parenting styles on psychopathology in early adolescence

Chao-Yi Lo<sup>1</sup>, Po-Hsiu Kuo<sup>1</sup>

<sup>1</sup> Institute of Epidemiology and Preventive Medicine, College of Public Health, National Taiwan University



## Introduction

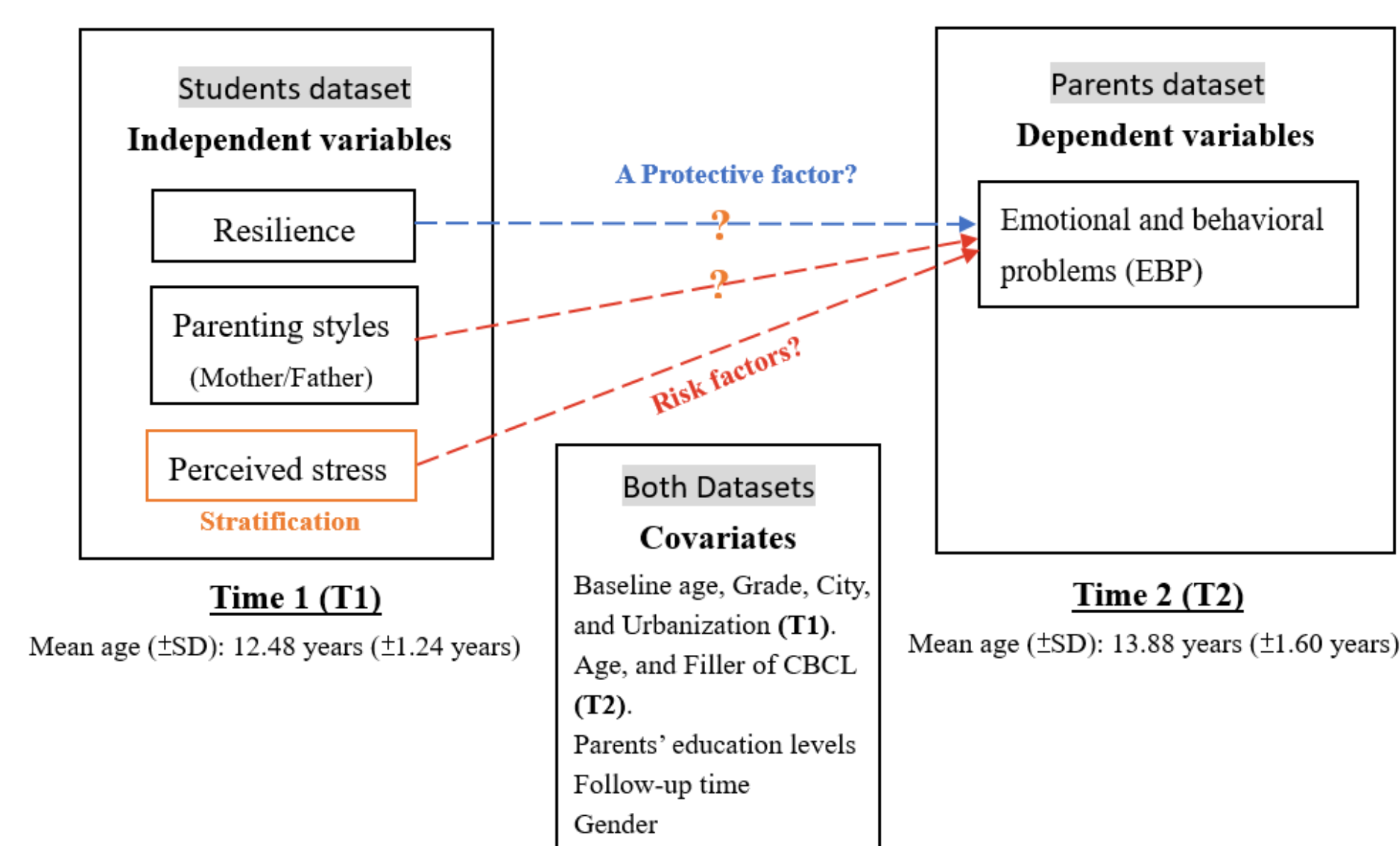
**Emotional and behavioral problems (EBP)** of children and adolescents are critical public health issues and may persist into adult life. Individuals **maladaptive to early life stressful events** is associated with an increased risk of mental problems, whereas **high levels of different dimensions of resilience** may have different mechanism to assist individuals in stressful situations toward **better outcomes**, which require further investigation.

On the other hand, strong evidence has shown **dysfunctional parental bonding** as one of key family factors influences offspring's psychopathological disorders, mainly in adults, and studies focusing on **early adolescents** as well as **discriminating the role of mother and father** are scarce.

Thus, we aimed to examine whether perceived stress, resilience, and parenting styles have impacts on emotional and behavioral problems among early adolescents in Taiwan and further to investigate the effects of resilience and parenting style on psychological problems **under different levels of stress**.

## Methods

**Study design** : A longitudinal study applied with data collected from **964** 4th and 5th grade elementary school as well as 7th grade junior high-school students at Time 1 and their 1 (42.84%) to 2-year (57.16%) follow-up data for Time2 (Procedure shown below).



## Measures

Variable	Questionnaire	Items	Assessment and Operational definition
Emotional and behavioral Problems (EBP)	Child Behavior Check List for age 6-18 years old (CBCL 6-18)	113	<b>8 syndromes scales</b> : <ul style="list-style-type: none"> <li>Anxious/Depressed</li> <li>Withdrawn/Depressed</li> <li>Somatic complaints</li> <li>Social problems</li> <li>Thought problems</li> <li>Attention problems</li> <li>Rule-breaking behavior</li> <li>Aggressive behavior</li> </ul> <b>Broadband scales (Internalizing &amp; Externalizing problems)</b> <b>Total problems scale</b> <b>Dichotomized variables</b> : Yes/No by applying the cutoffs of <b>borderline clinical range</b> (Age-sex standardized T score $\geq 65$ for Syndrome scales ; $\geq 60$ for Broadband and total problems scales).
Resilience	The Inventory of Adolescent Resilience (IAR)	28	The summary scores for each of 4 dimensions and a <b>global score</b> were computed. <b>Higher scores indicating better resilience.</b>
Parenting Style (Mother/Father)	Parental Bonding Instrument (PBI)	25	Calculated from 2 subscales for mothers and fathers separately. <b>Low maternal/paternal control</b> (scores $< 13.5/12.5$ ) and <b>high maternal/paternal care</b> (scores $\geq 27/24$ ) was categorized into <b>optimal maternal/paternal parenting</b> .
Perceived stress	Perceived stress scale (PSS)	10	A <b>higher</b> total scores represents <b>higher</b> level of stress with <b>median</b> scores by school levels as the cutoffs.

**Statistical analysis** : Multiple logistic regression was executed to analyze for the associations between independent variables and EBP, separately for paternal and maternal related variables, and stratified by stress to investigate its moderating effect. All statistical analyses were performed by using the SAS version 9.4.

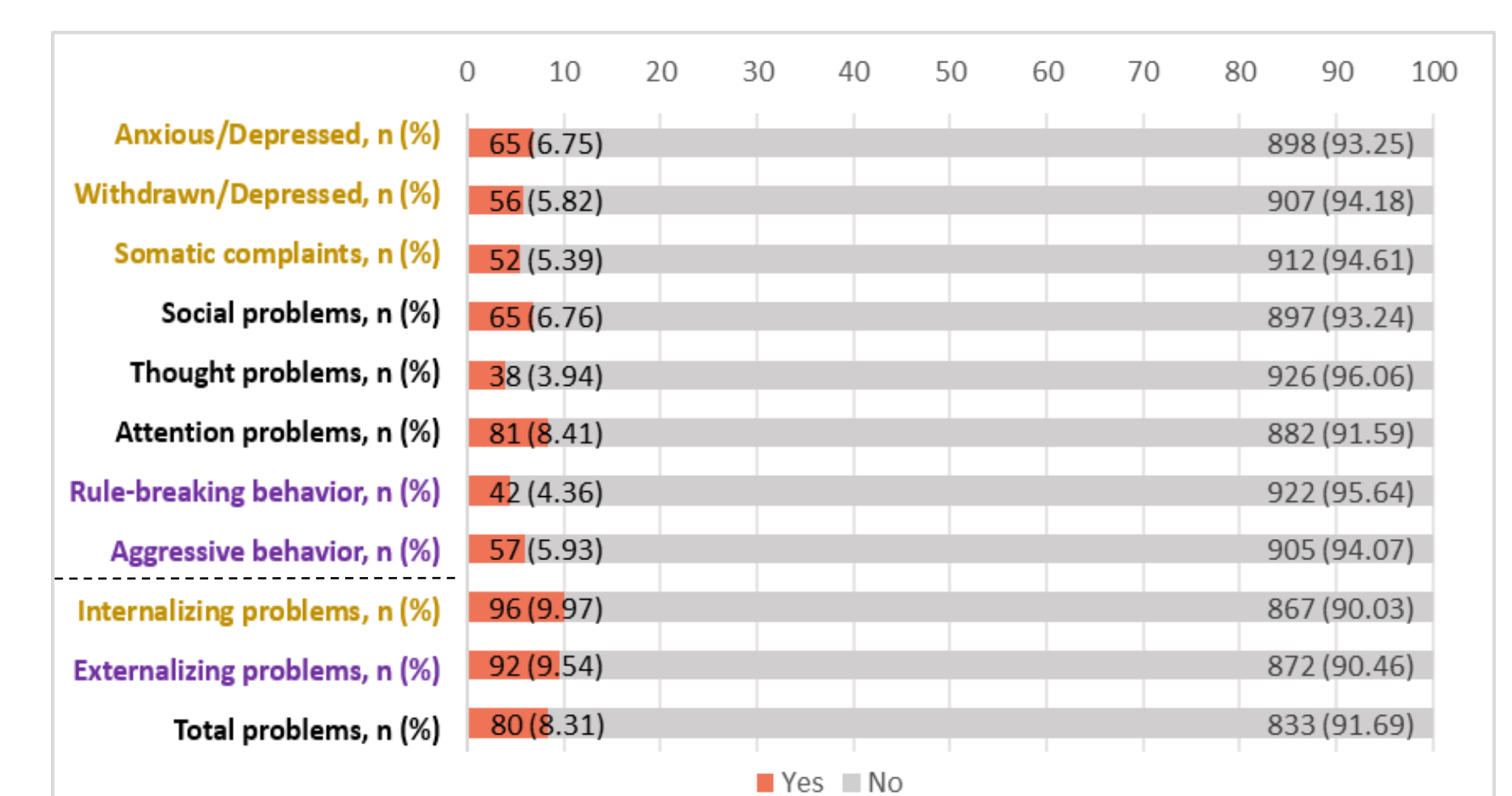
## Results

The mean duration of follow-up time between waves was  $1.41 \pm 4.47$  years. For sociodemographic characteristics, more than half of students were female ( $n=554$ , 57.47%), 7th grade ( $n=705$ , 73.13%), from New Taipei City ( $n=544$ , 56.43%). 71.68% ( $n=691$ ) fillers of CBCL at T2 were mother, around 40% have mother or father with college, university or above degree, and 777 (80.6%) students ascertained in schools located in the core city.

**Table 1 Associations between EBP at T2 and resilience dimensions, perceived stress, and parenting styles at T1 using multiple logistic regression**

EBP	Resilience_PC		Resilience_HO		Resilience_EI		Resilience_ER	
	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	
Anxious/Depressed	1.30 (0.96 - 1.75)	1.31 (0.97 - 1.77)	1.21 (0.91 - 1.60)	1.22 (0.92 - 1.62)	0.99 (0.74 - 1.32)	1.02 (0.76 - 1.35)	0.94 (0.71 - 1.23)	0.97 (0.74 - 1.28)
Withdrawn/Depressed	0.84 (0.61 - 1.15)	0.85 (0.62 - 1.17)	1.30 (0.96 - 1.75)	1.29 (0.95 - 1.75)	0.78 (0.57 - 1.06)	0.79 (0.58 - 1.07)	0.97 (0.72 - 1.30)	0.97 (0.72 - 1.31)
Somatic Complaints	1.25 (0.90 - 1.74)	1.22 (0.87 - 1.70)	1.37 (1.01 - 1.86)*	1.38 (1.01 - 1.89)*	1.19 (0.87 - 1.63)	1.19 (0.87 - 1.63)	1.16 (0.85 - 1.57)	1.19 (0.87 - 1.63)
Social Problems	0.87 (0.65 - 1.17)	0.91 (0.68 - 1.21)	1.14 (0.86 - 1.50)	1.18 (0.89 - 1.56)	0.80 (0.61 - 1.06)	0.86 (0.65 - 1.13)	0.89 (0.68 - 1.16)	0.94 (0.71 - 1.24)
Thought Problems	0.96 (0.66 - 1.39)	0.91 (0.63 - 1.32)	1.19 (0.84 - 1.68)	1.18 (0.83 - 1.69)	0.83 (0.58 - 1.18)	0.81 (0.57 - 1.16)	0.92 (0.65 - 1.29)	0.92 (0.65 - 1.31)
Attention Problems	0.77 (0.60 - 0.99)*	0.78 (0.60 - 1.01)	1.26 (0.98 - 1.62)	1.24 (0.96 - 1.60)	0.83 (0.65 - 1.07)	0.85 (0.66 - 1.08)	0.93 (0.73 - 1.19)	0.94 (0.73 - 1.20)
Rule-breaking Behavior	0.93 (0.66 - 1.32)	0.89 (0.62 - 1.26)	1.10 (0.80 - 1.51)	1.07 (0.77 - 1.49)	0.92 (0.66 - 1.29)	0.91 (0.65 - 1.26)	0.79 (0.57 - 1.10)	0.80 (0.58 - 1.12)
Aggressive Behavior	0.73 (0.54 - 0.98)*	0.71 (0.53 - 0.96)*	1.02 (0.76 - 1.36)	1.01 (0.76 - 1.36)	0.72 (0.54 - 0.96)*	0.73 (0.54 - 0.97)*	0.68 (0.51 - 0.91)**	0.70 (0.52 - 0.93)**
Internalizing Problems	1.06 (0.82 - 1.35)	1.32 (0.94 - 1.85)	1.32 (1.05 - 1.68)*	1.33 (1.05 - 1.69)*	0.94 (0.74 - 1.19)	0.96 (0.76 - 1.22)	0.98 (0.78 - 1.24)	1.00 (0.79 - 1.26)
Externalizing Problems	0.83 (0.65 - 1.06)	0.83 (0.65 - 1.06)	1.13 (0.89 - 1.42)	1.13 (0.89 - 1.43)	0.80 (0.63 - 1.02)	0.82 (0.65 - 1.04)	0.75 (0.60 - 0.95)*	0.77 (0.61 - 0.97)**
Total Problems	0.98 (0.75 - 1.28)	0.96 (0.74 - 1.26)	1.20 (0.93 - 1.54)	1.19 (0.92 - 1.54)	0.84 (0.65 - 1.09)	0.84 (0.65 - 1.08)	0.87 (0.68 - 1.11)	0.88 (0.68 - 1.13)

**Figure 1.** showed that the proportion of EBP at Time 2 was ranging from 38 (3.94%) students with thought problems to 96 (9.97%) with internalizing problems.



**Figure 1.** The proportion of EBP at T2 (Missing = 2 for social problems and aggressive behavior syndromes scales and = 1 for anxious, withdrawn, attention problems, internalizing problems, and total problems syndromes scales).

EBP	Resilience_Total		PSS		Not optimal parenting	
	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)
Anxious/Depressed	1.17 (0.86 - 1.59)	1.19 (0.88 - 1.63)	1.96 (1.46 - 2.64)***	1.88 (1.39 - 2.54)***	1.30 (0.73 - 2.31)	1.74 (0.97 - 3.11)
Withdrawn/Depressed	0.91 (0.65 - 1.26)	0.91 (0.66 - 1.26)	1.45 (1.05 - 2.00)**	1.41 (1.02 - 1.96)*	2.17 (1.13 - 4.16)**	2.80 (1.44 - 5.45)**
Somatic Complaints	1.34 (0.96 - 1.86)	1.32 (0.94 - 1.85)	1.30 (0.94 - 1.81)	1.27 (0.91 - 1.78)	2.50 (1.3 - 4.83)**	3.02 (1.55 - 5.91)**
Social Problems	0.88 (0.65 - 1.19)	0.94 (0.70 - 1.26)	1.47 (1.10 - 1.98)*	1.33 (0.98 - 1.8)	1.59 (0.89 - 2.84)	3.38 (1.79 - 6.38)**
Thought Problems	0.95 (0.65 - 1.38)	0.92 (0.63 - 1.34)	1.34 (0.91 - 1.96)	1.27 (0.86 - 1.87)	1.71 (0.81 - 3.58)	1.69 (0.80 - 3.57)
Attention Problems	0.88 (0.68 - 1.14)	0.89 (0.68 - 1.15)	1.15 (0.88 - 1.51)	1.14 (0.87 - 1.50)	1.69 (1.01 - 2.83)*	1.85 (1.1 - 3.11)**
Rule-breaking Behavior	0.93 (0.66 - 1.33)	0.90 (0.63 - 1.28)	1.40 (0.98 - 2.02)	1.34 (0.93 - 1.94)	3.53 (1.58 - 7.90)***	3.46 (1.55 - 7.74)**
Aggressive Behavior	0.72 (0.53 - 0.98)*	0.72 (0.53 - 0.98)*	1.10 (0.80 - 1.51)	1.05 (0.77 - 1.45)	1.71 (0.93 - 3.17)	1.84 (0.99 - 3.42)
Internalizing Problems	1.08 (0.84 - 1.40)	1.10 (0.85 - 1.42)	1.78 (1.39 - 2.30)***	1.73 (1.34 - 2.23)***	1.35 (0.83 - 2.17)	1.84 (1.13 - 3.00)**
Externalizing Problems	0.83 (0.65 - 1.07)	0.85 (0.66 - 1.09)	1.30 (1.01 - 1.67)*	1.24 (0.96 - 1.60)	1.78 (1.09 - 2.92)**	2.47 (1.49 - 4.10)**
Total Problems	0.96 (0.73 - 1.26)	0.95 (0.72 - 1.24)	1.31 (1.00 - 1.72)	1.28 (0.98 - 1.69)	2.11 (1.24 - 3.60)**	2.28 (1.33 - 3.89)**

All models were adjusted for gender, city, follow time (year), age, mom/dad education's level (for models including not optimal parenting of mom/dad), and filler with only including a resilience dimension at a time. The Legend marked by red/blue represent a significantly increased/decreased risk. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.005$  (for multiple testing). Total=Global score, AOR adjusted odds ratio PSS total score of Perceived Stress Scale, PC problem-solving and cognitive maturity dimension, HO hope and optimism dimension, EI empathy and interpersonal relationship dimension, ER emotional regulation dimension. The measurement unit for resilience dimensions and PSS is SD. Missing data for both dependent and independent variables was handled by multiple imputation.

**Table 2. Effects of resilience dimensions and parenting styles on EBP by levels of perceived stress at T1**

EBP	High perceived stress						Low perceived stress					
	Resilience dimension		Not optimal parenting		Resilience dimension		Not optimal parenting		Resilience dimension		Not optimal parenting	
	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	AOR(95%CI)	
PC	Attention Problems	0.84 (0.61 - 1.18)	0.83 (0.59 - 1.16)	1.46 (0.75 - 2.84)	1.60 (0.82 - 3.13)	0.69 (0.48 - 1.01)	0.74 (0.51 - 1.08)	1.65 (0.75 - 3.64)	2.05 (0.92 - 4.55)			
	Aggressive Behavior	0.75 (0.51 - 1.10)	0.74 (0.50 - 1.09)	2.19 (0.94 - 5.09)	2.78 (1.15 - 6.72)**	0.67 (0.42 - 1.07)	0.66 (0.41 - 1.05)	1.13 (0.44 - 2.92)	1.06 (0.41 - 2.76)			
HO	Somatic Complaints	1.19 (0.81 - 1.76)	1.22 (0.81 - 1.83)	3.62 (1.32 - 9.88)**	5.00 (1.67 - 15.02)***	1.38 (0.83 - 2.29)	1.36 (0.82 - 2.25)	2.33 (0.95 - 5.70)	2.32 (0.96 - 5.6)			
	Internalizing Problems	1.30 (0.98 - 1.71)	1.33 (1.00 - 1.77)	1.52 (0.86 - 2.70)	2.13 (1.18 - 3.87)**	1.00 (0.65 - 1.54)	1.01 (0.66 - 1.55)	1.77 (0.82 - 3.84)	2.22 (1.03 - 4.82)*			
EI	Aggressive Behavior	0.81 (0.55 - 1.18)	0.84 (0.57 - 1.25)	2.29 (0.99 - 5.28)	2.94 (1.21 - 7.13)**	0.59 (0.38 - 0.92)*	0.58 (0.37 - 0.91)*	1.02 (0.39 - 2.66)	0.94 (0.35 - 2.51)			
	Aggressive Behavior	0.74 (0.52 - 1.06)	0.77 (0.54 - 1.1)	2.24 (0.97 - 5.15)	2.91 (1.22 - 6.96)	0.58 (0.36 - 0.94)*	0.57 (0.35 - 0.93)*	1.15 (0.45 - 2.94)	1.04 (0.4 - 2.72)			
ER	Externalizing Problems	0.80 (0.61 - 1.06)	0.82 (0.62 - 1.1)	2.2 (1.15 - 4.22)**	3.10 (1.57 - 6.13)**	0.61 (0.41 - 0.89)*	0.63 (0.43 - 0.93)*	1.34 (0.63 - 2.88)	1.92 (0.9 - 4.11)			
	Aggressive Behavior	0.78 (0.52 - 1.17)	0.80 (0.53 - 1.21)	2.23 (0.96 - 5.19)	2.88 (1.19 - 6.98)	0.62 (0.39 - 0.99)*	0.61 (0.38 - 0.98)*	1.05 (0.44 - 2.75)	0.98 (0.37 - 2.60)			

Only resilience dimension that was significantly associated with one EBP will conduct stratified analysis with first col indicating the resilience dimension included in the models.

## Conclusions

Our finding reveals impacts of perceived stress, heterogeneity effects of resilience, and the distinct pattern of parenting styles between mother and father are needed to be considered when designing prevention and intervention programs for the prevention of mental problems among early adolescents.