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The impact of childhood trauma on meaning in life among middle school students: the chain-mediating roles of social support and core self-evaluations

Suqun Liao¹, Luyao Mo¹ and Lishen Wang^{1*}

Abstract

Background The negative impact of childhood trauma on adolescence' meaning in life has become a widely concerned topic. The junior high school students are still at a critical stage of developing their meaning in life. This study aims to explore the impact of childhood trauma on meaning in life among junior high school students, as well as the mediating role of social support and core self-evaluations.

Methods Cross-sectional data were collected from 23 schools in South China. 2,273 junior high school students completed self-reported questionnaires on demographic variables, childhood trauma, meaning in life, social support, and core self-evaluations. Statistical analysis was conducted via SPSS 27.0 and SPSS PROCESS.

Results Childhood trauma negatively impacted junior high school students' meaning in life significantly. Both social support (Indirect effect = -0.073, 95% CI, -0.112 ~ -0.034) and core self-evaluations (Indirect effect = -0.044, 95% CI, -0.061 ~ -0.028) were significant partial mediators in the childhood trauma and meaning in life. A chain mediating role of social support and core self-evaluations in the relationship between childhood trauma and meaning in life was also supported (Indirect effect = -0.048, 95% CI, -0.066 ~ -0.031). Hierarchical regression results showed that social support and core self-evaluations both positively predict meaning in life. When social support and core self-evaluations were added separately, the impact of childhood trauma weakened. When social support ($\beta = 0.113$, $t = 4.108$, $p < 0.001$) and core self-evaluations ($\beta = 0.165$, $t = 6.250$, $p < 0.001$) were both present, childhood trauma has the least impact on meaning in life.

Conclusions Strengthening the power of social support networks and fostering positive core self-evaluations may be important strategies for mitigating the negative effects of childhood trauma and enhancing meaning in life for junior high school students.

Keywords Childhood trauma, Meaning in life, Social support, Core self-evaluations, Chain intermediary

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Background

Childhood trauma refers to single or multiple forms of abuse and neglect experienced by individuals during childhood [1], such as physical abuse, emotional abuse, sexual abuse, physical neglect, or emotional neglect. In recent years, childhood trauma has gradually become a global problem. A survey by the World Health Organization revealed that more than one-third of the population has experienced childhood trauma. Childhood trauma may be the cause of mental disorders in 28.9% of patients, and it impacts physical and mental health throughout their entire life [2]. Individuals who experience childhood trauma may experience negative psychological reactions such as fear, anxiety, and depression [3]. If these reactions are not properly addressed, individuals may develop mental disorders in adolescence [4] and even exhibit extreme behaviors such as self-injury and suicide [5]. A comprehensive understanding of the mechanisms through which childhood trauma impacts individuals' physiological and psychological well-being is crucial for better supporting the growth of those who have experienced trauma. However, many critical questions remain unresolved [3], including: which physiological and psychological factors interact with childhood trauma to either persistently hinder or promote recovery, how to strengthen protective factors, the differences in cross-cultural and diverse trauma impacts, and the development of more comprehensive biopsychosocial predictive models.

Meaning in life is an individual's recognition and feeling of the meaning and value of life [6], and is an important buffer factor in resisting adversity, preventing self-harm and suicide among adolescents [7–9]. Early life adversity were associated with lower levels of purpose in adulthood even when controlling for demographic correlates [10, 11]. A meta-study including 22 studies from different countries on the meaning in life revealed a negative correlation between experiencing trauma and meaning in life [12], which indicated that Traumatic stress has been extensively studied in relation to meaning in life worldwide, and few discrepancies in results were found [12]. Developmental theorists have suggested that this purpose exploration process often occurs in adolescence and young adulthood. Therefore, clarifying the impact of trauma on their meaning in life and its possible psychological mechanisms might help individuals who have experienced trauma to grow positively and develop a healthy meaning in life.

Childhood trauma and meaning in life among junior high school students

According to a widely accepted definition, meaning in life is composed of three dimensions—coherence, purpose, and significance [13]. The theory of early childhood social development suggests that the key developmental

tasks in childhood involve developing internal representations or working models of the self and others [7]. Encountering neglect, abuse, unresponsive care giving in early life might interfere with the development of secure attachment, or a sense of self that is, at once, separate from and connected to others, which lead to the child develop a negative self-concept and insecure attachment relationships, forming a lower level of importance and consistency in life meaning [7]. Childhood abuse has a negative impact on meaning in life through the mediating role of internalized psychopathology such as depression, despair, and low self-esteem [14]. Because the development of purposeful living emerges during adolescence, the differences in timing and vulnerability may contribute to the potential resilience of purpose in the context of adverse childhood experiences. Some studies have showed that individuals who experience traumatic childhoods are not entirely incapable of achieving a high sense of life purpose [15]. In other words, the differences in personality, living environment and interpersonal interaction might provide the possibility for positive changes in life purpose under the background of traumatic childhood. That said, individuals could differ with respect to how early life events influence their development of a purpose in life. For instance, several individuals may find their purpose in life through reflection upon past events [16], even when those events were negative in nature. According to cross-sectional research showing that individuals tend to report the highest levels on sense of purpose reaches around middle adulthood [17]. However, individuals who experience adversity during childhood and adolescence may be less interested in, or less capable of purpose exploration during adolescence [17]. Therefore, this study proposes Hypothesis 1: childhood trauma negatively predicts meaning in life among junior high school students.

The mediating role of social support

Post-traumatic growth (PTG) is a quite new concept of positive psychology proposed in the mid- 1990s, which designates the set of “positive psychological changes resulting from the confrontation, from the struggle with any life event highly defiant the resources of the individual [17, 18]. The post-traumatic growth model suggests that cognitive and social support are crucial for individuals to achieve positive life goals after experiencing trauma. The cognitive process enabling the establishment of PTG include three steps: comprehensibility, management and restructure [18]. It is fundamental to note the importance of the social support received, whose role is to promote self-questioning and voluntary ruminations [18].

Social support refers to the external resources available to individuals who are experiencing stress [19], including

material and spiritual support, such as through family, school, peers, and society. Experiencing trauma may change an individual's perception of the environment. For example, abused children who grow up in dysfunctional families may not feel the support of their families [20], but good social support can reduce the negative effects of childhood trauma [19]. After children who experience trauma perceive social support from peers and parents, they gain a greater meaning in life [21]. And a study of Spanish adolescents shows that although adverse childhood experiences have a continuing impact on adolescents' alcohol and drug use, high social support during adolescence may mitigate the negative effects of adverse childhood experiences and provide lasting benefits [22]. Therefore, this study proposes Hypothesis 2: social support plays an intermediary role in the association between childhood trauma and meaning in life.

The mediating role of core self-evaluations

Core self-evaluations refer to the most basic evaluation of an individual's value and ability. Judge proposed that overall core self-evaluations consists of four personality traits: self-esteem, generalized self-efficacy, emotional stability, and locus of control [23]. Individuals who have experienced childhood trauma tend to think repeatedly about the negative stimuli associated with the traumatic event, resulting in a negative cognitive response style and a negative core self-evaluation [24]. A Netherlands study also showed that participants with childhood trauma had lower explicit self-esteem than those without childhood trauma, and emotional neglect was significantly associated with lower implicit self-esteem [25]. In addition, the theory of life meaning management shows that by effectively managing the inner world, including core self-evaluation elements such as self-esteem and self-efficacy, individuals experience joy and happiness in life, and clarify their goals and missions in life, so as to obtain a positive experience of life meaning to meet various challenges and dilemmas in life [26]. There is also a follow-up study that suggests that self-concept plays a crucial role in the construction of meaning in life. Core self-evaluation is an important part of self-concept, which more specifically reflects an individual's evaluation of their core traits and values [27]. Therefore, this study proposes Hypothesis 3: core self-evaluations play an intermediary role in the association between childhood trauma and meaning in life.

The chain-mediating roles of social support and core self-evaluations

According to PTG, the social supports promote self-questioning and voluntary ruminations, which might gradually revise the way of life, beliefs and frees from the goals he (or she) had set for himself (or herself) before

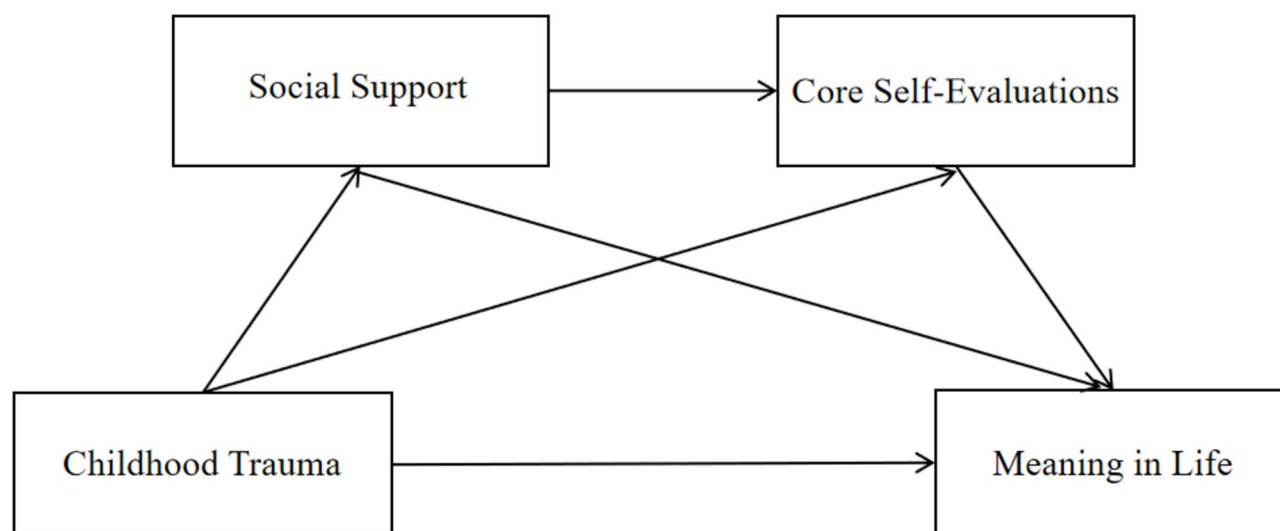
the trauma. The strong correlation between social support and core self-evaluations has been confirmed by multiple studies. The self-system model posits [28] that if the perceived social environment is more supportive, an individual's needs in terms of ability and sense of belonging will be better met; therefore, the person will be more effective in facing external challenges and will have greater self-evaluations. Childhood is a critical period for the formation of individual self-cognition. Children gradually develop self-concepts and cognition in the interpersonal interactions of the surrounding society [29], and the higher the degree of active interpersonal interaction is, the greater the child's core self-evaluation is [30]. Studies have also shown that perceptive social support significantly improves junior high school students' meaning in life and that self-esteem fully mediates this relationship [31]. Therefore, this study proposes Hypothesis 4: social support and core self-evaluations are chain mediators of the association between childhood trauma and meaning in life. The research model is shown in Fig. 1. Although existing studies have demonstrated a negative correlation between childhood trauma and meaning in life, research on early adolescent populations (specifically middle school students) remains limited. Furthermore, the existing literature seldom concurrently explores the chained mediating roles of social support and core self-evaluations between childhood trauma and meaning in life.

Methods

Participants

2,273 students in Grades 7 to 9 (average age: 14.00 ± 0.85 years) from 23 middle schools in South China were recruited through conduct cluster random sampling according to schools location which included 11 urban schools (47.8%) and 12 rural schools (52.2%), see Table 1. Although this method enhanced data collection efficiency, it might introduce selection bias (e.g., cooperating schools might place greater emphasis on mental health education). To mitigate bias, researchers selected schools evenly across regions with different levels of economic development (urban/rural) and reduced social desirability effects through anonymous questionnaire design.

Inclusion criteria included: (1) healthy 7–9th grade students with normal intelligence; (2) voluntarily participating and signing an informed consent form; (3) having no severe cognitive impairments or mental illnesses (initially screened by the class advisor). Exclusion criteria were: (1) having received psychotherapy in the past three months; (2) Having encountered a major life change in the past three months. The research was approved by the Medical Ethics Committee of Shaoguan University. Informed consent forms for parents and students were provided in accordance with the ethical principles outlined in the Declaration of Helsinki.

**Fig. 1** The proposed theoretical model**Table 1** Demographic background

Type	Number	Proportion(%)
Gender		
Boy	1,142	50.24
Girl	1,131	49.76
Grade		
7	796	35.01
8	755	33.21
9	722	31.76
Family income per month (¥)		
> 8000 (Excellent)	368	16.19
5000 ~ 8000 (Good)	718	31.58
3000 ~ 5000 (Fair)	894	39.33
< 3000 (Poor)	201	8.84
Unclear	92	4.04

Data collection

All the data were collected between March and April in 2023 on the period of a high - risk psychological problems during spring enrollment. The paper questionnaire was completed within 25 min in the classroom organized by the school and recycled on the spot. The researchers provided unified guidance language training for the school, and all participants were anonymous. A total of 2,496 questionnaires were received, of which 2,273 were valid questionnaires, with a validity rate of 90.9%. Excluded questionnaires included black due to student absences (4.2%) or were invalid (4.9%) having incomplete questionnaire responses or regular patterns in answering (e.g., selecting the same option for all items).

Measures

Meaning in life scale

The Meaning in Life Scale consists of two dimensions: Presence (MIL-P; presence of meaning in life) and Search

(MIL-S; searching for meaning in life), includes 9 questions [32]. Each item is scored on a scale ranging from 1 ("completely inconsistent") to 7 ("completely consistent"). The scale This scale has been applied to Chinese adolescents [33–35] and was confirmed through Confirmatory Factor Analysis (CFA), with model fit indices indicating satisfactory results: $\chi^2/df = 2.13$, CFI = 0.94, and RMSEA = 0.06. The Cronbach's alpha coefficient for this scale was 0.88.

Childhood trauma scale

The Childhood Trauma Scale, which was revised by Bernstein [36], includes 28 items across 5 dimensions: physical neglect, emotional abuse, emotional neglect, physical abuse and sexual abuse. Higher total scores indicate more severe childhood trauma. Moderately severe childhood trauma was indicated by the following scores on the individual dimensions: emotional abuse ≥ 13 , physical abuse ≥ 10 , sexual abuse ≥ 8 , emotional neglect ≥ 15 , and physical neglect ≥ 10 . A lack of childhood trauma was indicated by the following scores on the individual dimensions: emotional abuse < 13 , physical abuse < 10 , sexual abuse < 8 , emotional neglect < 15 , and physical neglect < 10 . This scale has been applied to Chinese adolescents [37–39]. The validity study of the scale showed that the five-factor model fit well (CFI = 0.92, RMSEA = 0.05). The Cronbach's alpha coefficient for this scale was 0.81.

Social support scale

The Social Support Scale, which was developed by Xiao SY [40], includes 10 items across three dimensions: subjective support, objective support and utilization of support. Items 1–5 and items 8–10 are scored on a scale ranging from 1 to 4 points. Items 6 and 7 assess

the number of sources of social support. This scale has been applied to Chinese adolescents [41–43]. The validity study of the scale showed that the five-factor model fit well: $\chi^2/df = 0.09$, CFI = 1.00, TLI = 1.00, RMSEA = 0.03. The Cronbach's alpha coefficient for this scale was 0.87.

Core self-evaluation scale

The core self-evaluation scale, which was revised by Du JZ et al. [44], includes 10 items. Each item is scored on a 5-point scale ranging from 1 (“completely disagree”) to 5 (“completely agree”). Higher scores indicate greater core self-evaluations. This scale has been applied to Chinese adolescents [45–47]. The validity of this scale among Chinese adolescents has been confirmed through Confirmatory Factor Analysis (CFA), with model fit indices indicating satisfactory results: $\chi^2/df = 2.20$, CFI = 0.94, and RMSEA = 0.07. The Cronbach's alpha coefficient for this scale was 0.83.

Statistical analysis

The PROCESS program developed by SPSS 27.0 (SPSS, Chicago, IL) was used for data analysis. Referring to others' research, total scores were used for analysis [33, 37, 41, 45]. First, descriptive analysis was performed via SPSS 27.0 to accurately characterize the sample. Second, Pearson's correlation analysis was conducted to quantify the associations between childhood trauma, meaning in life, social support, and core self-evaluations. Finally, SPSS macro model 6 was used to quantitatively examine the chain mediating effects of social support and core self-evaluations. Sensitivity and hierarchical regression analysis were used to verify the relationships and impacts of various variables. Statistical significance was indicated by a p value of 0.05. Bootstrapping was conducted with 5000 samples and 95% confidence intervals (CIs). Prior to formal data analysis, a comparison was conducted between using mean scores and total scores, revealing no significant differences between the two approaches. Standardized coefficients (β) were used in regression analyses to control for potential scale-related effects.

Results

Common method bias

In this study, Harman's single factor test was conducted to analyze common method bias. The results revealed that the maximum interpretation percentage was much lower than the standard value of 40%, and there was no factor with excessive interpretation power, indicating that there was no serious common method bias problem.

Descriptive statistics and correlation analysis

The original sample included 2,273 students. Descriptive results are presented in Table 2. We performed independent-samples t -tests for all other measures to test whether there was any gender difference. The results showed that there were no significant gender differences in meaning in life, while perceived meaning, childhood trauma, social support, and core self-evaluations showed gender differences. Girls in the sample scored higher on childhood trauma compared with boys. Boys scored higher than girls in perceived meaning, social support, and core self-evaluations.

Correlation analysis

Correlation analysis showed that there was a significant correlation between childhood trauma, social support, core self-evaluations, and meaning in life, and gender, grade, and family income were correlated with the main variables, as showed in Table 3. Therefore, gender, grade, and family income were used as control variables in this study.

Mediation effect analysis

Using the SPSS plug-in PROCESS model 6 developed by Hayes, 5,000 samples were bootstrapped. If the 95% confidence interval does not include 0, the intermediary effect is considered significant. The intermediary model includes childhood trauma as an independent variable, meaning in life as a dependent variable, and social support and core self-evaluations as chain intermediary variables. Gender, grade and family income are the covariates of the presented model. As shown in Fig. 2, the impact of childhood trauma on social support ($\beta = -0.588$, $p < 0.001$)

Table 2 Descriptive statistics for major study variables

Variables	Score Range	Whole sample (N = 2273)	Boys (n = 1142)	Girls (n = 1131)	t
Meaning in Life	9–63	41.47 ± 11.40	41.94 ± 12.34	41.01 ± 10.34	1.94
Presence of Meaning in Life	5–35	22.81 ± 7.03	23.34 ± 7.42	22.26 ± 6.56	3.68***
Searching for Meaning in Life	4–28	18.67 ± 5.63	18.59 ± 5.95	18.75 ± 5.28	-0.65
Childhood Trauma	28–125	51.19 ± 10.35	50.65 ± 10.50	51.73 ± 10.15	-2.50**
Social Support	10–50	31.61 ± 6.11	32.07 ± 6.23	31.15 ± 5.96	3.59***
Core Self-evaluation	10–50	33.10 ± 7.76	34.85 ± 7.64	31.34 ± 7.49	11.07***

Note: Data are presented as M ± SD

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3 Bivariate correlations for the variables

Predictors	1	2	3	4	5	6	7	8	9
1. Grade	–								
2. Gender	0.005	–							
3. Family income	0.071**	–0.04	–						
4. Childhood trauma	–0.054**	0.052*	–0.085***	–					
5. Social support	0.017	–0.075***	0.111***	–0.595***	–				
6. Core self-evaluations	–0.035	–0.226***	0.102***	–0.514***	0.605***	–			
7. Meaning in life	0.066**	–0.041	0.087***	–0.254***	0.275***	0.282***	–		
8. Presence of Meaning in Life	0.041	–0.077***	0.085***	–0.297***	0.348***	0.377***	0.922***	–	
9. Searching for Meaning in Life	0.083***	0.014	0.071**	–0.144***	0.122***	0.102***	0.875***	0.618***	–

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

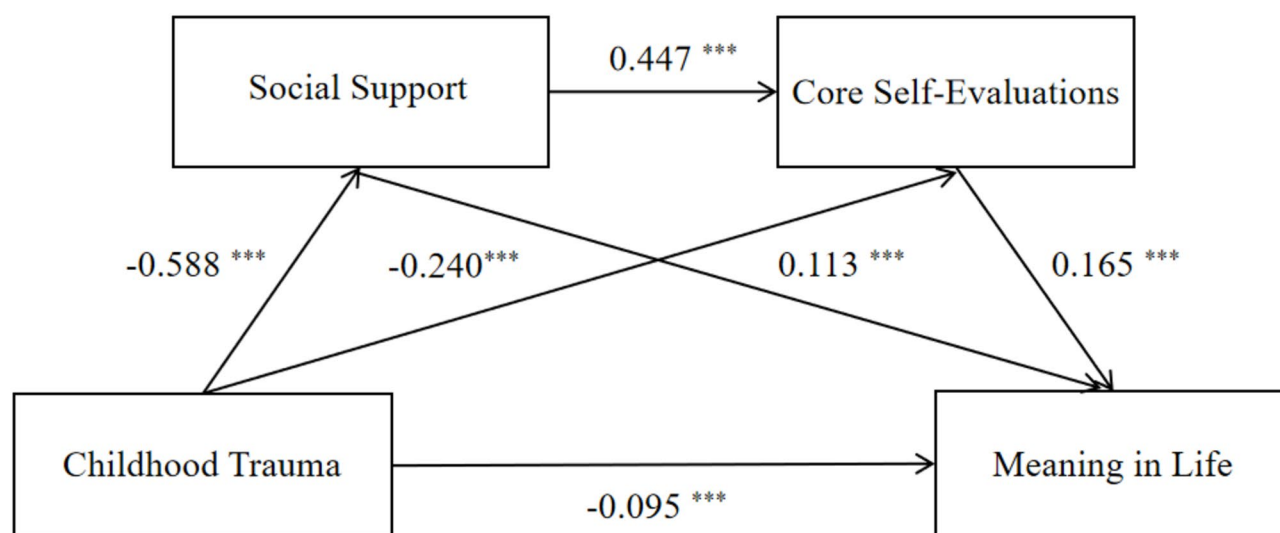


Fig. 2 Mediation model showing the associations among the study variables. Note: adjusted for grade, gender and family income; all continuous variables were standardized before they were entered in the path model: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 4 Total effects, direct effects and indirect effects

Path	Effect size	Boot SE	Boot CI		The Proportion of Effect Size
			Lower	Upper	
Total effect	–0.270	0.022	–0.314	–0.226	
Direct effect	–0.105	0.028	–0.160	–0.050	38.89%
Total indirect effects	–0.165	0.020	–0.204	–0.126	61.11%
Childhood trauma → Social support → Meaning in life	–0.073	0.020	–0.112	–0.034	27.04%
Childhood trauma → Core self-evaluations → Meaning in life	–0.044	0.008	–0.061	–0.028	16.30%
Childhood trauma → Social support → Core self-evaluations → Meaning in life	–0.048	0.009	–0.066	–0.031	17.78%

and core self-evaluations ($\beta = -0.240$, $p < 0.001$). All have a significant negative predictive effect. Both social support and core self-evaluations have a positive predictive effect on meaning in life ($\beta = 0.113$, $p < 0.001$ and $\beta = 0.165$, $p < 0.001$). There is also a significant positive predictive effect between social support and core self-evaluations ($\beta = 0.447$, $p < 0.001$). In addition, the indirect effect of social support explained 27.04% of the variance. The indirect effect of core self-evaluations explained 16.30%

of the variance. Finally, through social support and core self-evaluations, a chain intermediary was found between childhood trauma and meaning in life, explaining 17.78% of the variance, as shown in Table 4.

Sensitivity analysis

We randomly selected 80% of participants from the full sample to test for the mediating effect ($N = 1820$) and obtained very similar results (see Table 5). Both social

Table 5 Sensitivity analysis ($N = 1820$)

Paths	Effect size	Boot SE	Boot CI	
			Lower	Upper
Childhood trauma → Social support → Meaning in life	-0.080	0.023	-0.125	-0.036
Childhood trauma → Core self-evaluations → Meaning in life	-0.044	0.009	-0.064	-0.027
Childhood trauma → Social support → Core self-evaluations → Meaning in life	-0.052	0.010	-0.073	-0.033

support (indirect effect = -0.080, 95% CI, -0.125 ~ -0.036) and core self-evaluations (indirect effect = -0.044, 95% CI, -0.064 ~ -0.027) played an important role in mediating the relationship between childhood trauma and meaning in life. Social support and core self-evaluations were also supported in the mediating role of childhood trauma and meaning in life chain (indirect effect = -0.052, 95% CI, -0.073 ~ -0.033). The indirect effect of social support explained 28.78% of the variance. The indirect effect of core self-evaluations explained 15.83% of the variance. Finally, through social support and core self-evaluations, a chain intermediary was found between childhood trauma and the sense of meaning of life, explaining 18.71% of the variance.

Hierarchical regression

The hierarchical regression results reveal the relationship between different variables and the three dependent variables (meaning in life, social support, and core self-evaluations). Specifically, the analysis includes the impact of independent variables such as demographic background factors (gender, grade and family income), childhood trauma, social support, and core self-evaluations on the dependent variable, meaning in life. For the meaning in life, gender have no effect on meaning in life. Grade ($\beta = 0.049$, $t = 2.40$, $p < 0.05$) and family income ($\beta = 0.062$, $t = 3.044$, $p < 0.001$) had a strong impact on meaning in life, childhood trauma has a strong negative impact on meaning in life ($\beta = -0.245$, $t = -12.026$, $p < 0.001$) in Table 6 model 1. Social support and core self-worth positively predict meaning in life significantly (in Table 6 model 4 to model 6). When social support and core self-evaluations were added separately, the impact of childhood trauma weakened (in Table 6 model 4 and model 5). When social support ($\beta = 0.113$, $t = 4.108$, $p < 0.001$) and core self-evaluations ($\beta = 0.165$, $t = 6.250$, $p < 0.001$) were both present, childhood trauma has the least impact on meaning in life in Table 6 model 6.

For social support, the effects of grade level was not significant, gender had a weak but significant impact, childhood trauma had a strong negative impact on social support ($\beta = -0.588$, $t = -35.789$, $p < 0.001$) in Table 6 model 2. In terms of core self-evaluations, gender, grade, and childhood trauma all had significant negatively effects in Table 6 model 3. The R^2 values and F values of each model indicated that the model had good fit and statistical significance.

The results showed that childhood trauma negatively impacted social support, core self-evaluations, and meaning in life. Both social support and core self-evaluations positively predict meaning in life, significantly reducing the negative impact of childhood trauma.

Discussion

This study aimed to advance our understanding of how childhood trauma impacts meaning in life by testing the mediating roles of social support and core self-evaluations in a sample of junior high school students. The findings demonstrated that social support and core self-evaluations acted as a mediator between childhood trauma and meaning in life among high school students, respectively. Moreover, a chain mediation of social support and core self-evaluations the relationship between childhood trauma and meaning in life were also confirmed.

Consistent with previous findings, the results demonstrated that childhood trauma was negatively associated with meaning in life [48, 49], which may be related to biological, cognitive and emotional factors. Study found that childhood trauma might lead to alterations in the structure, function, and connectivity of key areas involved in cognition, such as the prefrontal cortex, hippocampus, and amygdala, as well as changes in the integrity of the white mass bundle, particularly in the corpus callosum [50], which might be a biological basis for emotional and cognitive changes after childhood trauma. According to hopelessness theory, when individuals are powerless in changing a negative event or its unfortunate meaning, they are prone to feelings of diminished hope [51]. Traumatic childhood experiences can weaken children's resilience and increase their susceptibility to psychological stress and negative emotions later in life, thereby increasing the risk of a diminished the meaning in life [52]. Moreover, abused individuals often have a greater risk of suicide, suggesting that they are more prone to exhibiting a hopeless cognitive style [53].

Childhood trauma was negatively associated with social support [54] and core self-evaluations, which findings were similar to those from previous studies. Junior high school students who experienced childhood trauma had lower perceived social support and lower self-evaluations. Meanwhile, There is a positive correlation between social support, core self-evaluations and meaning in life. Notably, the study confirmed that better social support

Table 6 Hierarchical regression analysis on meaning in life, social support, and core Self-Evaluations

Variables	Model 1 (Dependent variable: Meaning in life)				Model 2 (Dependent variable: Social support)				Model 3 (Dependent variable: Core Self-Evaluations)				Model 4 (Dependent variable: Mean- ing in life)				Model 5 (Dependent variable: Meaning in life)				Model 6 (Dependent variable: Meaning in life)			
	β	t	95%CI		β	t	95%CI		β	t	95%CI		β	t	95%CI		β	t	95%CI		β	t	95%CI	
Gender	-0.026	-1.267	[-1.491, 0.321]	-2.481*	-0.042		[-0.915, -0.107]	-11.328***	-0.179		[-3.256, -2.295]	-0.018	-0.891		[-1.304, 0.489]	0.016	0.793		[-0.545, 1.286]	0.012	0.572		[-0.647, 1.180]	
Grade	0.049	2.407*	[0.130, 1.275]	-1.100	-0.019		[-0.398, 0.112]	-3.637***	-0.057		[-0.866, -0.259]	0.052	2.608**		[0.187, 1.319]	0.063	3.137**		[0.339, 1.468]	0.062	3.098**		[0.326, 1.452]	
Family income	0.062	3.044**	[0.187, 0.863]	3.597***	0.061		[0.126, 0.427]	1.830	0.029		[-0.012, 0.347]	0.051	2.509*		[0.094, 0.763]	0.050	2.494*		[0.090, 0.757]	0.046	2.288*		[0.055, 0.720]	
Childhood trauma	-0.245	-12.026***	[-0.314, -0.226]	-34.789***	-0.588		[-0.367, -0.328]	-12.236***	-0.240		[-0.209, -0.151]	-0.135	-5.418***		[-0.203, -0.095]	-0.138	5.909***		[-0.102]	-	-		[-0.160, -0.050]	
Social support								22.746***	0.447		[0.519, 0.616]	0.187	7.476***		[0.257, 0.439]	-	-		-	0.113	4.108***		[0.110, 0.310]	
Core Self-Evaluations																0.212	8.858***		[0.243, 0.381]				[0.167, 0.319]	
ΔR²	0.070				0.358				0.438				0.092			0.101							0.107	
R²	0.072				0.359				0.439				0.094			0.103							0.110	
F	43.899***				317.983***				355.096***				47.146***			52.010***							46.458***	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

and higher core self-evaluations were associated with better meaning in life. Other studies of trauma, social support and self-esteem [21] also supported that improving social support and self-evaluation led to higher meaning in life.

The current study extended previous literature to further clarify how childhood trauma lowers the subsequent meaning in life of junior high school students via social support. As hypothesized, social support constituted the mediating processes through which childhood trauma led to meaning in life. Some empirical studies have also supported this mediating role. According to PTG model, the availability of social support resources and the relational network are of particular importance to facilitate PTG. The social support received allows a reduction in the emotional distress felt after the traumatic event and the transition to more voluntary ruminations. It is therefore important that the individual be able to tell the story of what he has experienced to benevolent people [55]. These stories force him to confront the question of meaning and to consider how to reconstruct himself [56, 57]. Childhood trauma lead to a impaired social support, which makes it difficult to achieve self-reconstruction and meaning in life.

Our study has identified the negative association between childhood trauma and core self-evaluations. According to development theory, individual self-perception comes from feedback on the individual's interaction with the environment. Childhood experiences and social support are important sources of individual self-perceptions. In the current study, core self-evaluations mediates the relationship between childhood trauma and meaning in life among junior high school students. Specifically, childhood trauma decreased core self-evaluations and consequently reduced meaning in life. Our observation is in line with the findings reported in previous literature documenting how higher self-esteem [21] and self-evaluation improved meaning in life [58] and reduced the risk of suicide [59].

It is worth noting that the chain effect of social support and core self-evaluations mediates childhood trauma and meaning in life among junior high school students. Traumatic childhood experiences might cause individuals to have distrust and negative expectations of interpersonal relationships, which in turn affected their prosocial behavior. The specific manifestations are the behaviors of individuals in interpersonal communication, such as retreat and avoidance, which prevent individuals from establishing stable and healthy interpersonal support [60, 61]. A persistently reduced level of interpersonal support reduces the satisfaction of individuals' psychological needs, which lead to doubts about self-worth, negative attitude toward the future and subsequent low meaning in life [62, 63]. The regression analysis in this study

showed that when social support and core self-evaluations were added at the same time, childhood trauma had the smallest β absolute value but still significant impact on meaning in life, which verified the mediating role of social support and core self-worth was reliable. In addition, we discovered multiple psychosocial factors, such as grade, were associated with meaning in life in hierarchical regression analysis ($p < 0.05$). These factors should also be taken into great consideration for effective psychosocial intervention for junior high school students who experienced childhood trauma.

What need to be pointed out that there may be mutual influences between social support, core self-evaluations, and meaning in life. Meaning in life also affects individual's feelings, behaviors, and interpersonal interactions in the environment. Individuals with a low meaning in life have a lower sense of self ability, are more passive and pessimistic in interpersonal communication and which led to be less likely to receive good social support [64], while the individuals with a high meaning in life have a greater sense of vitality, self-ability, self-awareness and core self-evaluations, and are more able to pay attention to positive factors rather than feeling ignored or neglected [8]. Therefore, it is necessary to understand results of this study from different angles and more comprehensively.

Strengths and limitations

The main strength of this study lies in exploring the possible pathway by which childhood trauma affects on the meaning in life of junior high school students who is on the stage of developmental life purpose.

Childhood trauma not only directly reduces life meaning in junior high school students, but also indirectly reduces life meaning by negatively affecting social support and core self-evaluations. This chain mediation model emphasizes the importance of the interaction between internal and external factors, Enhance understanding of the mechanisms related to the impact of traumatic experiences on the meaning in life, suggesting that we need to pay attention to the optimization of the external environment and the cultivation of internal psychological resources when promoting children's post-traumatic growth. Specifically, the psychological intervention for students who have experienced adversity should be conduct different dimensions such as family, peers and individuals. Cooperation between school and family, peer support (for example, establishing a peer support group) help students perceive the good interpersonal support from teacher, parents and classmates. Individual counseling, cognitive and ability training to improve core self - evaluation (such as self - efficacy enhancement plans), to help them form post - traumatic growth.

This study has several limitations. First, this study employed a cross-sectional design, which hinders conclusion from cause-and-effect relation to be drawn. Nevertheless, the results of the current study provide guidance for future investigations on any causal relations among the measured variables. Secondly, only age, gender and family socioeconomic status were collected as demographic data and included as covariates in this study, which might not exclude the effect on meaning in life from personal personality traits and so on. Future studies can investigate the role of other viable variables (such as family ties, personality and so on) which may influence meaning in life, to reveal more comprehensive mechanism of childhood trauma on the meaning of life. Thirdly, though the sample size of the current study is commendable, participants in this study share similar regional and cultural characteristics conditions, the result need to be interpreted with caution. Therefore, the generalizability of applying these results to the other people might be limited. Using different samples is important, because self-recognition [65, 66] and individuals' seeking, acceptance, and emotional perception of social support vary significantly across different cultural backgrounds [67, 68]. Findings from this study provide implications for future studies to further investigate such mechanism beyond Chinese population. Fourthly, this study employs total scores for variable analysis, potentially causing data compression or effect value inflation. Multidimensional analysis, mean values, or Z-scores are recommended to enhance accuracy.

Conclusions

Childhood trauma significantly negatively predict the sense of meaning in life among middle school students. Core self-evaluations and social support positively predict meaning in life. The negative prediction of childhood trauma on junior high school students' meaning in life may be related to the chain mediation of decreased social support level and core self-evaluations.

Supplementary Information

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Supplementary Material 1

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Author contributions

Suqun Liao conceived and designed the study. Suqun Liao contributed to the background and discussion. Luyao Mo contributed to the data analysis and took the lead in writing the manuscript. Lishen Wang prepared figures 1–2. All the authors have read and agreed to the published version of the manuscript.

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Data availability

Data is provided within supplementary information file.

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the guidelines of the Declaration of Helsinki, was approved in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board (or Ethics Committee) of the Medical College of Shaoguan University (0001,20220710). Informed consent has been obtained from all participants participating in the study and from the parents or legal guardians of participants under 16 years of age.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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