BMC Psychology

RESEARCH Open Access

Association between parents' value of children and adolescent depression in China: a multi-informant study

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Abstract

Background Parents' value of children (VOC) is a related implicit belief toward their children that may predict adolescents' mental health. However, empirical studies are scarce about this relationship. This study investigates the relationship between parents' VOC and adolescent depression, as well as the underlying mechanisms.

Methods We conducted a multi-informant survey and developed a latent moderated mediation structural equation model of adolescent depression outcome of parents' VOC. A total of 963 Chinese adolescents and their parents were recruited and examined. The parents completed the parents' VOC scale and the adolescents responded to the scales of emotional warmth and rejection, external locus of control (LOC), and depression.

Results Parents' social and psychological VOC exerted a positive and negative direct effect respectively, on adolescent depression. Parents' social VOC positively predicts adolescent depression through parental emotional warmth, rejection, and external LOC. Parents' psychological VOC negatively predicts adolescent depression through emotional warmth and rejection. The indirect effects of parents' social VOC on adolescent depression through emotional warmth and rejection were moderated by sex.

Conclusions The two aspects of parents' VOC exerted indirect effects on adolescent depression through emotional warmth and rejection or external LOC. The indirect effects of parents' social VOC on adolescent depression were more evident among women than men. Our study extends the theoretical research framework of parents' VOC to adolescent mental health.

Keywords Depression, Parents' value of children, Emotional warmth, Rejection, External locus of control

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Background

Depression is a complex and heterogeneous syndrome characterized by mood disturbances accompanied by cognitive impairments, such as difficulty concentrating, and somatic symptoms, including insomnia and loss of appetite [1]. Depression is a serious mental disorder among adolescents, with its incidence and prevalence increasing worldwide [2]. Furthermore, depression can lead to adolescent's internet addition [3], dropping out of school [4], and even self-harm and suicide [5]. Consequently, it is crucial to investigate the core factors that contribute to depression in adolescents. An important perspective in understanding the influencing factors of adolescent depression has focused on parental factors. For example, negative parenting style [6], parental attachment [7], and parental divorce [8] have been associated with the adolescent depression. However, the implicit attitudes or beliefs of parents toward their children garnered little attention. Parents' value of children (VOC) includes their psychological belief about the potential benefits of having a child [9–11], including subjective motivation for childbearing [12], such as seeking social, relational and psychological benefits [13, 14]. Parents' VOC is an important topic in family research, few studies have examined its role in adolescent depression. This study aims to investigate the association and underlying mechanisms of the relationship between parents' VOC and adolescent depression. This exploration enables the identification of modifiable factors suitable for intervention targets for adolescent depression. Such insight can guide the strategies aimed at preventing or intervening in early-onset depression among adolescents.

Systemic model of youth depression

In investigating the influence of family-related factors on adolescent depression, researchers have introduced the systemic model of youth depression [15]. This model offers a comprehensive understanding of the developmental mechanisms underlying adolescent depression across five different system levels. The initial level, the individual subsystem, pertains to parent or child characteristics, including cognitive style or personality traits. The second level, the parent-child subsystem, addresses aspects of the parent-child relationship, such as parenting styles. The marital subsystem, at the third level, encompasses elements of the spousal relationship, such as marital conflict. The whole family subsystem, as the fourth level, encompasses interactions among the various subsystems. The final level, the extra-family level, considers factors external to the family that influence family dynamics, such as socio-economic factors.

Parents' VOC encapsulates the overarching implicit beliefs, goals, and aspirations that parents harbor regarding their children's upbringing and development [13]. According to the systemic model of youth depression [15], parents' VOC is situated within the parent-child subsystem, and it may be associated with adolescent depression. Based on this model, this study aims to investigate the effect of parents' VOC on adolescent depression. Furthermore, this study also focuses on the adolescent individual subsystem, and integrates the parent-child subsystem with the adolescent individual subsystem within the broader context of the whole family subsystem to delve deeper into the mechanisms underlying adolescent depression.

Parents' VOC and adolescent depression

Parents' VOC comprises their social, relational, and psychological VOC [14, 16]. Parents' social VOC is their belief to receive social benefits from having a child, such as enhancing the family's economic status, supporting the elderly, and continuing the family line [16, 17]. This social benefit is utilitarian in nature, emphasizing the external benefits associated with having children. Parents who prioritize this aspect may focus on factors such as the family's reputation, the continuation of traditions, and meeting societal expectations [12–14]. Additionally, they may value their children's practical contributions to the family, particularly regarding boys, whom they often see as torchbearers responsible for carrying on the family line and potentially providing support in their later years [9, 11]. Parents' relational VOC is based on the belief of receiving relational benefits from having a child, such as enhancing the parental sense of responsibility and strengthening connections with relatives, and spouses [14]. Unlike the utilitarian flavor of social benefits, relational benefits underscore the familial value of children and highlight their role in fostering harmonious family dynamics [9, 14]. Parents who prioritize reaping the relational benefits of parenting see their children as conduits to family connection, assisting them in fulfilling their parental duties [14]. Consequently, relational benefits are characterized by a lesser utilitarian focus compared to social benefits. Parents' psychological VOC is based on the belief that they will receive psychological benefits from their children. These gains are pleasure, love, companionship, and satisfaction from having a child [11, 14, 16]. The psychological value that parents place on their children is not rooted in the utilitarian benefits the child may provide, but rather it is entirely driven by the emotional needs of the parents.

Parents' social VOC includes children's material benefits in youth and adulthood [16]. A higher level of parents' social VOC, the less emotional connection there may be between parent and adolescent [18], and the more negative emotions the adolescent may experience during childhood [19, 20], which facilitates adolescent depression. Moreover, parents' social VOC tends to be

associated with a utilitarian social purpose [13, 14]. They care more about whether the cost of raising children will be rewarded and they can provide financial support as adults. This expectation may lead to children experiencing more psychological pressure from childhood, which leads to adolescent depression.

Parents' psychological and relational VOC does not require adolescents to exert significantly more effort to fulfill the parents' purpose of raising children. The birth meets the needs of those who want to enjoy this journey. It does not put too much pressure on the child. These parents care more about whether the child is happy in their growth stage; this attitude contributes to the development of adolescents' good mental health. Moreover, parents' psychological and relational VOC favor positive family values that create a positive family emotional climate [11] and contribute to developing healthy family functions. Adolescents growing up in this environment generally experience greater well-being and less depression [21, 22].

Mediating role of emotional warmth and rejection

Previous studies found that parents' VOC influence various aspects of parenting, including the attitudes and behaviors exhibited by parents in their day-to-day interactions with their children [11–13, 16], that is the parenting style [23]. Similarly, like parents' VOC, parenting style is belonged to parent-child subsystem in accordance with the systemic model of youth depression [15]. Furthermore, the systemic model posits that factors within the same subsystem can be interconnected to influence adolescent depression [15]. It can be posited that parents' implicit VOC may influence their external parenting style, which, in turn, may affect adolescent depression. Parenting styles are characterized by emotional warmth, showing support, attention, encouragement, and acceptance [24]. They are also identified by rejection, that is, the absence or withdrawal of parental love, care, acceptance, and support, and the presence of verbal insults, hostility and criticism, and punishment [25, 26].

Parents' social VOC focuses on the family line, tends to hold children to high standards, and employs strict and punitive negative parenting to make them stand out and bring glory to the family [27]. Moreover, parents oriented toward supporting the elderly, helping the family economically, and doing household chores may not exhibit emotional warmth but rejection when their children are growing up; they want their upbringing to be smooth [14]. Parents' psychological and relational VOC reflect emotional closeness between generations [16]. Those who hope to obtain happiness, satisfaction, company, and continued close contact with their families by raising a child consider the child's happiness as their greatest concern. During their growing period, parents may provide their children with more emotional warmth to ensure a happy childhood. Moreover, emotional warmth and rejection are vigorous predictors of adolescent depression, the warmth can reduce depression [28], whereas rejection can lead to it [29]. Therefore, parents' VOC may predict depression among adolescents through the mediators of parental emotional warmth and rejection.

Mediating role of external locus of control (LOC)

The systemic model of youth depression proposed that the adolescent characteristics within the individual subsystem, particularly a negative cognitive style, are regarded as risk factors influencing adolescent depression [15]. External locus of control (LOC) is defined as the belief that life outcomes are primarily controlled by external forces, such as fate or powerful others, rather than one's own actions [30]. Individuals with an external LOC tend to attribute successes and failures to factors beyond their control, which can contribute to feelings of helplessness and, consequently, elevate their risk of depression [31]. Additionally, this systemic model suggests that the relationship between subsystems, such as the parent-child subsystem and the individual subsystem, interacts in ways that influence adolescent depression [15]. This interplay is conceptualized within the context of the whole family subsystem [15]. Based on the whole family subsystem, it may be that parents' VOC within the parent-child subsystem is associated with adolescent depression via the external LOC within the individual subsystem.

Intuitively, parents' positioning of their children's values can affect adolescents' positioning of their own values and abilities. Parents with a social VOC focus on cultivating children's obedience to ensure that they are a reliable source of income and support in adulthood [9]. They do not desire the child's autonomy because an autonomous child may grow up to become an independent adult who will value themselves and separate from the family [16]. Children who obey parents for a long time may lack a sense of control and develop an elevated level of external LOC in adulthood. However, parents with a psychological or relational VOC will create democratic relationships with their children [11] and give them more autonomy, thus reducing the possibility of high external LOC. Learned helplessness theory proposes that an external LOC can produce reactive depression [31, 32]. Therefore, it may play a mediating role between parents' VOC and adolescent depression.

In addition, parenting style can create situations that allow their children to know themselves [33]. Emotional warmth can foster positive feelings in adolescents about themselves and fulfill their autonomy needs [34], thus may predicting lower levels of external LOC. Conversely, adolescents exposed to rejection may develop negative

self-evaluations by internalizing negative parental feelings [34], which in turn are associated with higher levels of external LOC. Observing the combinations of these factors can reveal whether parents' VOC predicts adolescent depression through parenting style and an external LOC.

Moderating role of sex

In China, men and women are traditionally expected to fulfill different social functions [35]. For instance, males are better qualified to carry the family name, provide financial support, and take care of the elderly [36]. This perspective can meet parents' social VOC, and result in them preferring boys, which reflects their parenting style [36]. Parents with social VOC will employ less emotional warmth and more rejection on a girl. However, this approach is not adopted by parents with psychological and relational VOC because they can derive psychological benefits from both.

Moreover, this negative parenting style of rejection will inadvertently signal to girls that they are worthless [37]. Gradually, they will internalize their parents' ideas and believe them, thus resulting in poor self-image and a negative cognitive style such as external LOC [37]. Therefore, parents' social VOC is more strongly associated with emotional warmth, rejection, and external LOC for women. Hence, the mediating effect of warmth and rejection, and external LOC between parents' social VOC and adolescent depression is more obvious in women than in men.

Present study

This study applied a multi-informant method survey investigate the adolescent and their parents to test the effects of parents' VOC on adolescent depression and the underlying mechanism. First, we assessed the predictive effect of parents' VOC on adolescent depression, postulating a direct relationship. Specifically, we hypothesized that parents' social VOC directly and positively predicted adolescent depression, whereas parents' psychological and relational VOC directly and negatively predicted it. Second, this study explored the underlying mechanism of the effects of parents' VOC on adolescent depression from the perspectives of both the external parenting style and the internal cognitive style. We hypothesized that parents' VOC had an indirect effect on adolescent depression through emotional warmth, rejection, and external LOC. Moreover, parents' VOC would predict adolescent depression through multiple paths from emotional warmth and rejection to external LOC. Finally, we investigated whether the indirect effect of parents' social VOC on adolescent depression through emotional warmth, rejection and external LOC varied by sex, and hypothesized that the indirect effect would be moderated by sex such that the indirect effect is stronger among women.

Methods

Participants

This study employed convenience sampling and recruited 963 adolescents and their parents to complete a multi-information survey. Participants were selected from one junior high school and one senior high school in Anhui Province, as well as two universities in Jiangsu Province. The selection criteria for these educational institutions were based on their type and level of academic performance, with a focus on Chinese public schools within the average range of academic performance. We recruited only one full-time parent of each adolescent. There were no missing data in this study. Among the parents in the sample (aged 33–67, $M_{age} = 46.05 \pm 4.39$ years), 42% were fathers (aged 37–64, $M_{age} = 46.54 \pm 4.14$ years) and 58% were mothers (aged 33–67, $M_{age} = 45.70 \pm 4.53$ years). Fathers had an average of 9.87 ± 3.37 years and mothers had 9.20 ± 3.76 years of education. Among the adolescents (aged 14–20, $M_{age} = 17.72 \pm 1.95$ years), 44.5% were men ($M_{age} = 17.64 \pm 1.96$ years), and 55.5% were women ($M_{age} = 17.78 \pm 1.94$ years).

Procedure

This study obtained permission from the administrator of the participating schools and the Research Ethics Review Committee of Beijing Normal University. Firstly, we initiated formal communication with the school administrator to explain the research objectives and obtain permission to conduct the study. Subsequently, we submitted the questionnaire to the school administration for review to ensure its appropriateness. Secondly, with the assistance of class teachers, we distributed the consent form to both parents and adolescents. The consent form emphasized the research purpose, procedures, principles of anonymity, voluntariness, and the option to withdraw at any time. In accordance with the principle of voluntary participation, parents and adolescents returned the signed consent form to the class teacher. As consent from both adolescents and parents was necessary for participation, only joint consent was accepted for inclusion in the study. Thirdly, we collaborated with class teachers to determine the optimal time and method for distributing the questionnaires, ensuring simultaneous completion by parents and adolescents. Lastly, online surveys were conducted with coordinated assistance from class teachers.

The survey comprised two sections, one for parents and one for adolescents, housed within the same website link to ensure the integrity of the data provided by parents and adolescents. Parents were first required to provide background information on age and educational level, followed by completion of the parents' VOC scale.

Subsequently, adolescents were required to provide background information on sex, age, school type and location, after which they completed the emotional warmth, rejection, external LOC, and depression scales. To guarantee the data confidentiality, the questionnaire did not include any personally identifiable information such as names, addresses, or contact details. Additionally, all measurement items were set as mandatory to prevent participants from submitting incomplete data, thereby ensuring the data quality. However, it is important to note that the survey environment was uncontrolled, and participants were not supervised.

Measures

Parents' value of children

This study used the parent-report method and the parents' VOC scale to measure parents' motivation to raise their children, a scale that has been widely used in a Chinese sample of adolescent parents in the China Family Panel Studies, which focus on marriage, gender, child development and other key life issues of current concern in Chinese society [38]. This scale encompasses three dimensions regarding parents: social VOC, psychological VOC, and relational VOC. Each dimension contains three items. Sample items are "raising children to help the family economically," "raising children to enjoy having a baby," and "raising children to strengthen connections with relatives." The parents were asked to rate each item on a five-point scale (1: *Completely disagree* to 5: *Completely agree*). In this study, the parents' VOC scale demonstrated good reliability with a Cronbach's α of 0.81. Additionally, parents' social (Cronbach's $\alpha = 0.78$), psychological (Cronbach's $\alpha = 0.85$), and relational VOC (Cronbach's $\alpha = 0.83$) subscales also exhibited good internal consistency.

Emotional warmth and rejection

Parental emotional warmth and rejection were assessed using the corresponding subscales of the Chinese version of the Short-form Egna Minnen Beträffande Uppfostran (s-EMBU) [26]. The measure was originally developed by Arrindell et al. [39] to assess perceived parenting styles cross-culturally and was subsequently validated for Chinese adolescents by Li et al. [26], demonstrating strong reliability and construct validity in this population. The emotional warmth and rejection subscales contain six items each. The adolescent participants rated their parents' frequency of engagement in 12 specific behaviors from 1 (*Never*) to 4 (*Always*). Sample items of emotional warmth were "my parents praised me" and "my parents used words and gestures to show that they liked me." Sample items of rejection were "my parents treated in a way that I felt ashamed" and "my parents would severely punish me, even for trifles." The adolescent participants recorded the behavior of the parent who spent more time taking care of them in daily life. In this study, the emotional warmth (Cronbach's $\alpha = 0.90$) and rejection (Cronbach's $\alpha = 0.86$) subscales possessed substantial reliability.

External LOC

To assess adolescents' external LOC, we used the Chinese version of the external LOC subscale [40], adapted from Levenson's LOC Scale [41]. The subscale comprises four items rated on a 6-point scale ranging from 1 (*Completely disagree*) to 6 (*Completely agree*). A specific item was: "I feel like what happens in my life is mostly determined by powerful people." The scores ranged between four and 24. The higher the score, the more the participant felt that external factors control their life. The scale possessed adequate internal consistency and reliability (Cronbach's $\alpha = 0.79$).

Depression

Depression in adolescents was assessed using the simplified Chinese version of the Center for Epidemiologic Studies Depression Scale (CES-D) as revised by Jin et al. [42] and based on Radloff [43]. In this scale, the depression dimension comprises nine items, each beginning with "In the last month, how often have you…" and continuing with, for example, "felt that you could not shake off the blues even with help from family or friends." The adolescent participants were asked to respond to each item on a four-point scale ranging from 1 (*less than 1 day*) to 4 (*5–7 d*ays). This scale had good internal consistency and reliability (Cronbach's $\alpha = 0.88$).

Data analyses

Initially, we conducted descriptive, differential, and correlation analyses using SPSS 24.0. To discern disparities in background characteristics between adolescents with and without depression, we utilized chi-square and Mann-Whitney U tests, employing a cutoff score of 19 to screen for depressive symptoms [42]. Subsequently, we transitioned to *Mplus* 8.0 to evaluate our hypothesis model, treating depression as a continuous variable across all analyses. To establish a more dependable basis for drawing conclusions, we adopted a two-fold approach. One aspect involved integrating background variables such as sex, age, school type, location and parents' age and education level as covariates in all analytical models. This strategic inclusion helps to mitigate potential confounding effects, allowing for a more accurate assessment of the unique contributions of predictors to adolescent depression outcomes, as well as its mediating effects. Concurrently, we treat the main variables as the latent variables. This methodology is instrumental in minimizing measurement error, thereby enhancing the reliability

and robustness of the models. The detailed analysis of the hypothesized models proceeded as follows:

First, we constructed a direct model with latent parents' VOC as predictors and the latent depression as the outcome, with background variables serving as covariates to verify the direct effect of parents' VOC on adolescent depression. Second, building upon the direct model, we included latent emotional warmth, rejection, and external LOC as mediators and developed a latent mediated model to examine the indirect effect of parents' VOC on adolescent depression through emotional warmth, rejection, and external LOC. We calculated the indirect effects by performing a bias-corrected bootstrap test at the 95% confidence interval. The bias-corrected bootstrap has been demonstrated to offer more precise estimation and improved statistical inference [44], particularly for analyzing multiple mediation and moderated mediation effects, which is superior to other methods [44–46]. Finally, we developed a latent moderated mediation model by two steps [47] to investigate whether the indirect effect of parents' social VOC on adolescent depression was moderated by sex. In the first step, we incorporated latent parents' social VOC and sex as predictors, latent emotional warmth, rejection, and external LOC as mediators, and controlled for background variables to construct model 0. In the second step, we introduced the latent interaction between parents' VOC and sex to model 0, thereby creating model 1, which represents a latent moderated mediation model. A log-likelihood ratio test was conducted to determine whether model 1 fit the data significantly better than model 0 [47]. Model 1 was considered to provide a better fit if the log-likelihood ratio test yielded a significant result [47].

Model fit was evaluated using the $\chi 2/df$, the comparative fit index (CFI), Tucker-Lewis's index (TLI), the root means square error of approximation (RMSEA), and the standardized root mean residual (SRMR) [48, 49]. The model was deemed acceptable if it met the following criteria: CFI > 0.90, TLI > 0.90, RMSEA < 0.08, and SRMR < 0.08 [48, 49]. However, if the RMSEA for the baseline (null) model is less than 0.158, an incremental measure of fit may not be that informative [50, 51]. For regression coefficients, we report both non-standardized (b) and standardized (β) results. Standardized results are obtained by transforming all model variables— observed and latent—to a mean of 0 and a standard deviation of 1 [52]. This process standardizes path coefficients (e.g., regression coefficients, factor loadings), eliminating the influence of measurement units and enabling direct comparison of relative effects across predictors [52]. All statistical tests were two-tailed, with significance threshold set at $\alpha = 0.05$ [53].

Results

Preliminary analyses

Table 1 displays the background characteristics of the adolescents with and without depressive symptoms and their parents. Among the adolescents in the sample, 19.5% were classified as having depressive symptoms. Moreover, the results show no significant differences in sex, location, age, and parental factors between the number of adolescents with and without depression symptoms.

Table 2 presents the correlations between predictive variables and adolescent depression. We found significant correlations among adolescent depression and parents' social VOC ($r = 0.18$, $p < 0.001$), parents' psychological VOC ($r = -0.18$, $p < 0.001$), emotional warmth ($r = -0.44$, $p < 0.001$), rejection ($r = 0.45$, $p < 0.001$), and external LOC ($r = 0.38$, $p < 0.001$).

Direct effect model analyses

The analysis revealed that the baseline model demonstrated poor fit (RMSEA = 0.172), exceeding the threshold of 0.158. This confirms that the CFI and TLI of the direct effect model are meaningful for interpretation. The direct effects model demonstrated a good overall fit, with $\chi^2/df = 2.950$, CFI = 0.939, TLI = 0.931, RMSEA = 0.045 (0.041–0.049), and SRMR = 0.044. Moreover, parents' social VOC ($b = 0.23$, $\beta = 0.24$, $p = 0.000$) and psychological VOC ($b = -0.19$, $\beta = -0.21$, $p = 0.000$) had significant positive and negative direct effects, respectively, on adolescent depression. However, their relational VOC did not directly predict adolescent depression ($b = -0.02$, $\beta = -0.02$, $p = 0.671$).

Latent mediation model analyses

The result showed the latent mediation model (Fig. 1) had a good fit ($\chi^2/df = 2.760$, CFI = 0.937, TLI = 0.931, RMSEA = 0.043 [0.040–0.045], SRMR = 0.042). Crucially, the baseline model's inadequate fit (RMSEA = 0.162), exceeding the threshold of 0.158, substantiates the interpretability of the CFI and TLI values for the latent mediation model.

Moreover, parents' social VOC indirectly predicted adolescent depression in two ways. First, a one-step path that involved emotional warmth ($b = 0.05$, $\beta = 0.05$, 95% CI = [0.03, 0.07], $p = 0.001$), rejection ($b = 0.10$, $\beta = 0.10$, 95% CI = [0.07, 0.14], $p = 0.000$) and external LOC ($b = 0.06$, $\beta = 0.07$, 95% CI = [0.04, 0.10], $p = 0.000$). Second, a two-step path that comprised emotional warmth ($b = 0.01$, $\beta = 0.01$, 95% CI = [0.00, 0.02], $p = 0.037$) and rejection ($b = 0.01$, $\beta = 0.01$, 95% CI = [0.01, 0.03], $p = 0.017$) through external LOC.

Parents' psychological VOC indirectly predicted adolescent depression in two ways: a one-step path involving emotional warmth ($b = -0.05$, $\beta = -0.06$, 95% CI =

Table 1 Demographic characteristics of the participants (*N* = *963*)

	Without depressive symptoms (*n* = 775)	**With depressive symptoms (*n* = 188)**	***p***
	***n*,%**	***n*,%**	
Sex (n = 963)			0.060
Men (*n* = 429)	333 (43%)	96 (51.1%)	
Women (*n* = 534)	442 (57%)	92 (48.9%)	
School type (n = 963)			0.04*
Junior high school (*n* = 129)	93 (12%)	36 (19.15%)	
Senior high school (*n* = 318)	260 (33.5%)	58 (30.85%)	
College (*n* = 516)	422 (54.5%)	94 (50%)	
Location (n = 963)			0.898
City (*n* = 424)	341 (44%)	83 (44.1%)	
Town (*n* = 292)	233 (30.1%)	59 (31.4%)	
Village (*n* = 247)	201 (25.9%)	46 (24.5%)	
Age group			0.272
14–17 (*n* = 447)	353 (45.55%)	94(50%)	
18–20 (*n* = 516)	422 (54.45%)	94(50%)	
***Mean Age*(SD) (n = 963)**	*17.80 (1.944)*	*17.40 (1.99)*	*0.060*
Parent who spent more time taking care of the children in daily life from birth to present (*n* = 963)			0.398
Mother (*n* = 559)	455 (58.7%)	104 (55.3%)	
Father (*n* = 404)	320 (41.3%)	84 (44.7%)	
***Mean Age*(SD) (n = 963)**	*46.08 (4.29)*	*45.95 (4.78)*	*0.712*
***Educational years*(n = 963)**	*9.44 (3.59)*	*9.66 (3.72)*	*0.448*

Notes: p value: Chi-square test and Mann-Whitney U test. *$p < 0.05$

[−0.10, −0.04], $p = 0.001$), rejection ($b = -0.04$, $\beta = -0.05$, 95% *CI* = [−0.08, −0.02], $p = 0.014$) and a two-step path involving emotional warmth through external LOC ($b = -0.01$, $\beta = -0.01$, 95% *CI* = [−0.02, −0.00], $p = 0.035$; see Table 3).

Latent moderated-mediation model analyses

The analysis revealed that the baseline model exhibited poor model fit (RMSEA = 0.182 > 0.158) validated the interpretability of Model 0's fit indices (without latent interaction; Figure S1): $\chi^2/df = 3.292$, CFI = 0.935, TLI = 0.928, RMSEA = 0.049 (0.046–0.052), SRMR = 0.041, all meeting established criteria for acceptable model fit. Second, the log-likelihood ratio test result indicated that Model 1(see Fig. 2) with the latent interaction of parents' social VOC and sex was better (D = 20.77, $df = 1$, $p < 0.001$).

In Model 1, the latent interaction of parents' social VOC and sex significantly predicted rejection ($b = -0.26$, $\beta = -0.12$, $p = 0.005$) and emotional warmth ($b = 0.31$, $\beta = 0.16$, $p = 0.000$) but did not predict external LOC ($b = 0.12$, $\beta = 0.06$, $p = 0.199$). Specifically, parents' social VOC predicted more rejection for women ($b = 0.51$, $\beta = 0.39$, $p = 0.000$) than for men ($b = 0.16$, $\beta = 0.16$, $p = 0.005$; see Fig. 3). Moreover, for women, it predicted less emotional warmth ($b = -0.37$, $\beta = -0.30$, $p = 0.000$), whereas for men, it did not predict emotional warmth ($b = 0.01$, $\beta = 0.01$, $p = 0.819$; see Fig. 4).

Thereafter, we explored the mediating effect of emotional warmth and rejection conditioned by sex. The results showed that for women, the indirect effect of parents' social VOC on adolescent depression through emotional warmth ($b = 0.08$, $\beta = 0.06$, 95% *CI* = [0.03, 0.11], $p = 0.012$) was significant, but this aspect was not significant for men ($b = -0.00$, $\beta = 0.00$, 95% *CI* = [−0.03, 0.02], $p = 0.824$). Moreover, the indirect effect of parents' social VOC on adolescent depression through rejection was stronger for women ($b = 0.14$, $\beta = 0.12$, 95% *CI* = [0.06, 0.19], $p = 0.001$) than for men ($b = 0.05$, $\beta = 0.05$, 95% *CI* = [0.02, 0.09], $p = 0.016$). Furthermore, the multiple indirect effects of parents' social VOC on adolescent depression through emotional warmth and rejection through external LOC were significant for women ($b = 0.02$, $\beta = 0.02$, 95% *CI* = [0.01, 0.04], $p = 0.035$; $b = 0.03$, $\beta = 0.02$, 95% *CI* = [0.01, 0.05], $p = 0.050$) but not significant for men ($b = 0.00$, $\beta = 0.00$, 95% *CI* = [−0.01, 0.00], $p = 0.848$; $b = 0.01$, $\beta = 0.01$, 95% *CI* = [−0.00, 0.01], $p = 0.196$; see Table 4).

Discussion

This study revealed direct relationships between parents' VOC and adolescent depression. Specifically, we found a direct and positive relationship between parents' social VOC and adolescent depression, and a direct and negative relationship between parents' psychological VOC and adolescent depression. However, contrary to our

Table 2 Correlation between variables and descriptive statistics (*N* = *963*)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Sex	–																
2 Age	−0.04																
3 School type 1	0.05	−0.67***															
4 School type 2	0.01	−0.45***	−0.28***														
5 School type 3	−0.04	0.88***	−0.42***	−0.75***													
6 Location 1	0.06	−0.08*	−0.02	0.11***	−0.10**												
7 Location 2	−0.12***	0.06	−0.02	−0.06	0.07*	−0.59***											
8 Location 3	0.05	0.02	0.04	−0.06	0.03	−0.52***	−0.39***										
9 Parents' age	0.07*	0.06	−0.04	−0.03	0.05	−0.01	0.01	0.00									
10 Parents' educational level	0.05	0.03	−0.02	0.00	0.02	0.08*	−0.02	−0.06*	−0.12***								
11 Parents' social VOC	0.23	−0.02	0.10**	−0.06*	−0.06	−0.13***	0.05	0.09*	0.04	0.06							
12 Parents' relational VOC	0.13	−0.03	0.06	−0.01	−0.03	−0.01	0.05	−0.04	0.00	0.03	0.33***						
13Parents' psychological VOC	−0.05	0.06	−0.07*	0.01	0.04	0.08	0.01	−0.10**	0.00	0.01	0.09**	0.52***					
14 Emotional warmth	−0.09*	0.02	−0.03	−0.01	0.03	0.10**	−0.01	−0.10**	0.04	0.02	−0.18***	0.15***	0.28***				
15 Rejection	0.08*	−0.09*	0.11***	−0.01	−0.07*	−0.03	−0.03	0.06*	−0.03	−0.04	0.24***	−0.04	−0.14***	−0.50***			
16 External LOC	0.12***	−0.03	0.05	0.02	−0.05	−0.04	0.06	−0.02	−0.01	−0.04	0.25***	0.03	−0.08*	−0.25***	0.26***		
17 Depression	0.01	−0.05	0.07*	−0.02	−0.03	−0.05	0.07*	−0.01	−0.01	0.03	0.18***	−0.02	−0.18***	−0.44***	0.45***	0.38***	
M	–	–	–	–	–	–	–	–	46.05	9.48	8.48	10.29	11.36	17.71	8.87	10.77	16.19
SD	–	–	–	–	–	–	–	–	4.39	3.62	2.36	2.39	2.21	4.15	2.96	4.15	5.35

Notes: Sex was coded as 0 = female, 1 = male. Dummy variable school type 1 was coded as 0 = senior high school and college, 1 = junior high school; school type 2 was coded as 0 = junior high school and college, 1 = senior high school; school type 3 was coded as 0 = junior and senior high school, 1 = college. Dummy variable location 1 was coded as 0 = town and village, 1 = city; location 2 was coded as 0 = city and village, 1 = town; location 3 was coded as 0 = city and town, 1 = village. *$p < 0.05$, **$p < 0.01$,***$p < 0.001$

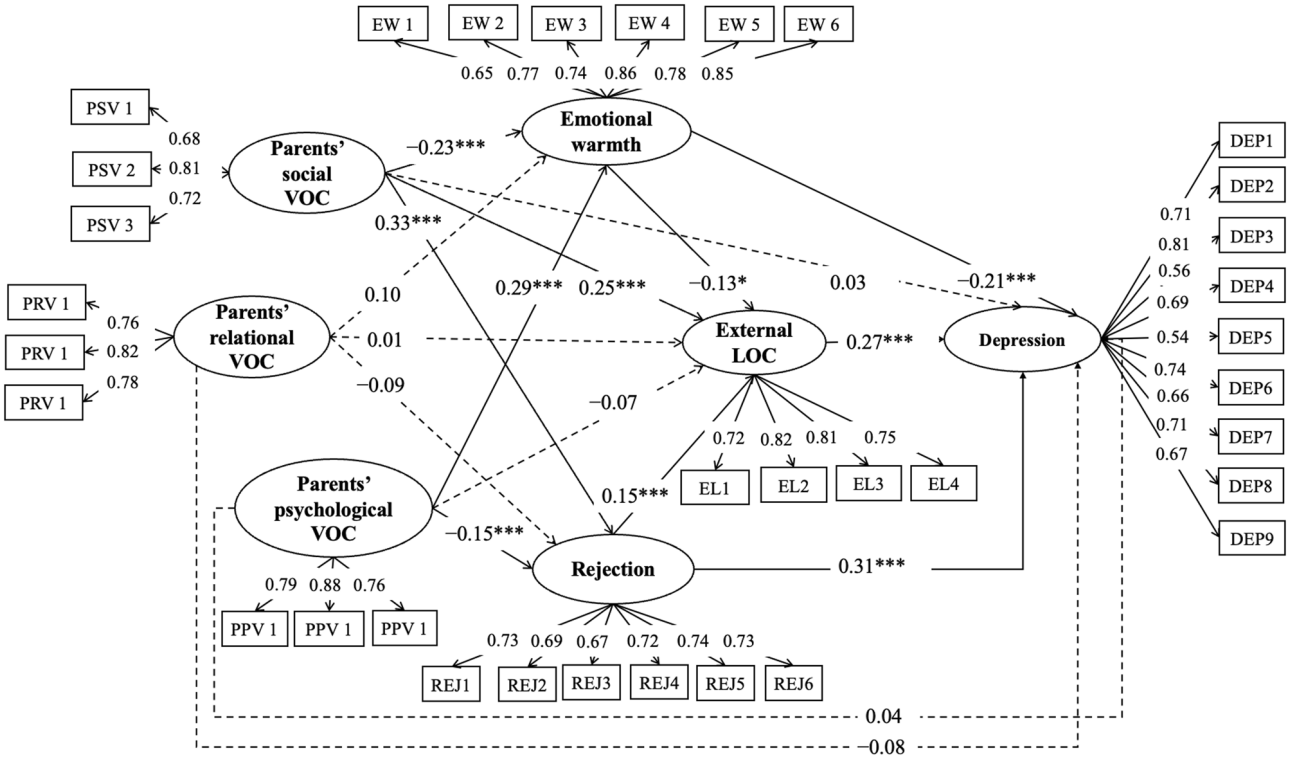

Fig. 1 Latent mediation structural equations model. *Note*: PSV1 - PSV3 are parents' social VOC scale items; PRV1 - PRV3 are parents' relation VOC scale items; PPV1 - PPV3 are parents' psychological VOC scale items; EW1– EW6 are emotional warmth subscale items; REJ1– REJ6 are rejection subscale items; EL1– EL4 are external LOC scale items; DEP1– DEP9 are depression scale items. Adolescent sex, age, school type, location, parents' age, and parents' years of education were controlled as covariates. All values in the figure represent standardized estimates, including path coefficients and factor loadings. ***$p < 0.001$. *$p < 0.05$

Table 3 Bias-corrected bootstrap test of indirect effects for the latent mediation model ($N = 963$)

Paths	Boot indirect effects	Boot lower limit 95% CI	Boot upper limit 95% CI
Parents' social VOC			
Parents' social VOC → emotional warmth → depression	0.05**	0.03	0.07
Parents' social VOC → rejection → depression	0.10***	0.07	0.14
Parents' social VOC → external LOC → depression	0.07***	0.04	0.10
Parents' social VOC → emotional warmth → external LOC → depression	0.01*	0.00	0.02
Parents' social VOC → rejection → external LOC→ depression	0.01*	0.01	0.03
Parents' psychological VOC			
Parents' psychological VOC → emotional warmth → depression	−0.06**	−0.10	−0.04
Parents' psychological VOC → rejection → depression	−0.05*	−0.08	−0.02
Parents' psychological VOC → external LOC → depression	−0.02	−0.04	0.01
Parents' psychological VOC → emotional warmth → external LOC → depression	−0.01*	−0.02	−0.00
Parents' psychological VOC → rejection → external LOC → depression	−0.01	−0.02	0.00

Notes: CI = Confidence interval. All values represent standardized estimates. *$p < 0.1$, **$p < 0.01$, ***$p < 0.001$

hypotheses, parents' relational VOC did not emerge as a significant negative predictor of adolescent depression, despite previous research suggesting that parents' relational VOC promotes positive family values [14]. A plausible explanation is that parents believe that raising children can reduce risk by marriage extension, improve marriage quality, and place children as the glue of spousal relationships. Parents' relational VOC may endow children with value through benefits to the entire family or spousal relationships rather than to the child. Therefore, it does not predict adolescent depression as significantly as parents' psychological VOC. We also provide novel insights into the mechanism of effects of parents' social and psychological VOC on adolescent depression.

First, parents' social and psychological VOC could predict adolescent depression through emotional warmth

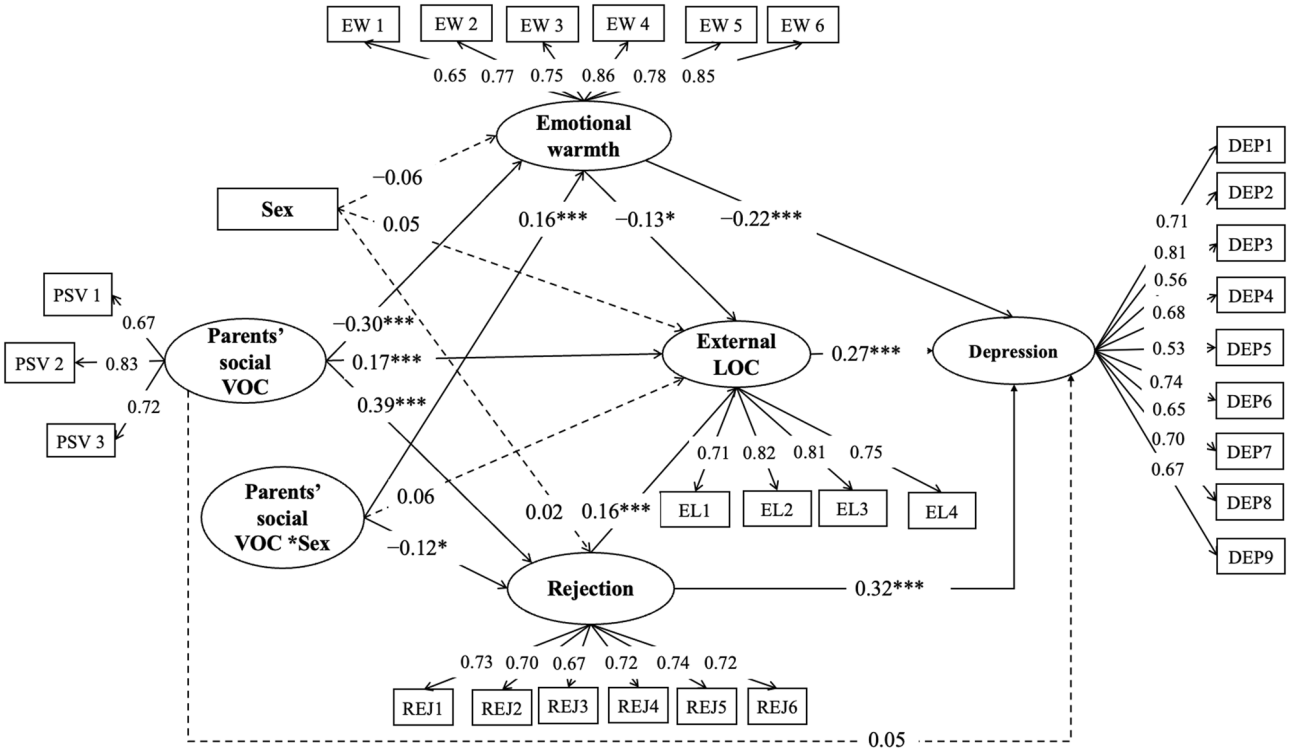

Fig. 2 Latent moderated-mediation structural equations model. *Note*: PSV1 - PSV3 are parents' social VOC scale items; EW1– EW6 are emotional warmth subscale items; REJ1– REJ6 are rejection subscale items; EL1– EL4 are external LOC scale items; DEP1– DEP9 are depression scale items. Adolescent sex, age, school type, location, parents' age, and parents' years of education were controlled as covariates. All values in the figure represent standardized estimates, including path coefficients and factor loadings. ***$p < 0.001$. *$p < 0.05$

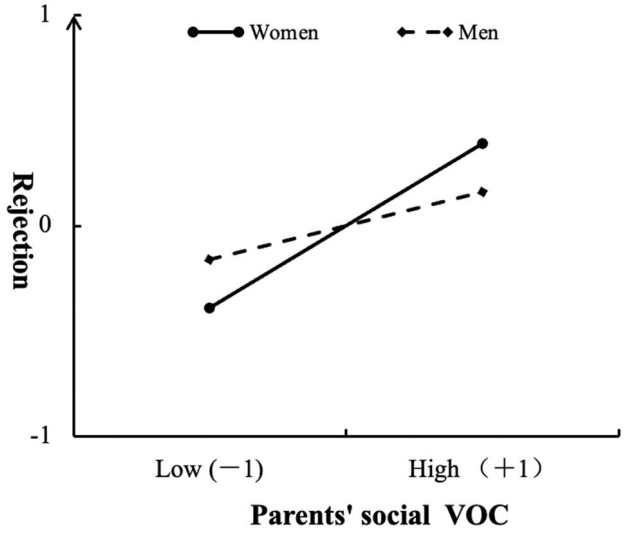

Fig. 3 Interactive effect of parents' social VOC and sex on rejection

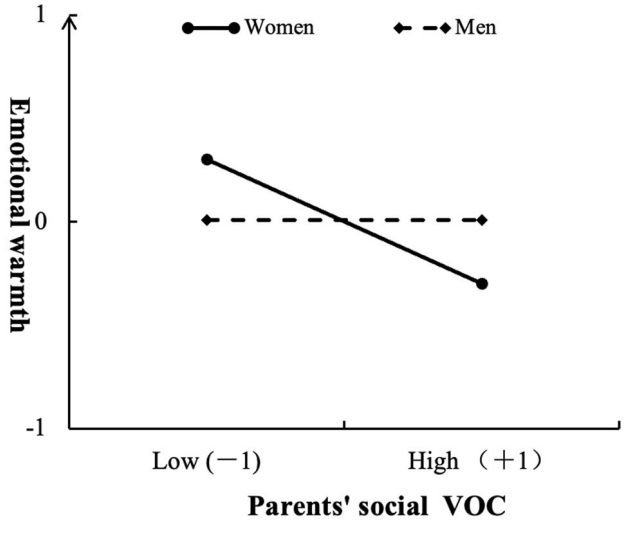

Fig. 4 Interactive effect of parents' social VOC and sex on emotional warmth

and rejection. Along with parents' perspective, we clarified the internal mechanism of their VOC on adolescent depression from the perspective of adolescents' negative cognitive style, the external LOC. Parents' social VOC is associated with increased adolescent depression through high external LOC. However, their psychological VOC cannot predict adolescent depression through external LOC. These parents enjoy the happiness and satisfaction their children bring to them and positively evaluate them. As they grow up, adolescents gradually internalize their parents' positive evaluations, integrate them into more global and stable views of themselves and their abilities

Table 4 Bootstrap results for conditional indirect effects of parents' social VOC on adolescent depression as a function of sex (*N* = *963*)

Paths	Boot indirect effect	Boot lower limit 95% CI	Boot upper limit 95% CI
Parents' social VOC → emotional warmth → depression			
Men	0.00	–0.03	0.02
Women	0.06*	0.03	0.11
Parents' social VOC → rejection → depression			
Men	0.05*	0.02	0.09
Women	0.12**	0.06	0.19
Parents' social VOC → emotional warmth → external LOC→ depression			
Men	0.00	–0.01	0.00
Women	0.02*	0.01	0.04
Parents' social VOC → rejection → external LOC → depression			
Men	0.01	–0.00	0.01
Women	0.02*	0.01	0.05

Note: CI = Confidence interval. All values represent standardized estimates. *$p < 0.1$, **$p < 0.01$

[33], and use them to form positive self-concepts and cognitions. Nonetheless, this process may not predict the negative cognition of external LOC.

Furthermore, this study indicated that the mediating effect of emotional warmth and rejection between parents' social VOC and adolescent depression depends on sex. These effects are stronger for women. Raising children for social benefits is a traditional family value [14]. Parents with social VOC may value boys more and hence, they may adopt more negative and less positive parenting style for girls. This result is partially consistent with a previous study that showed that parental preference for boys make girls have adverse experiences during childhood [36].

Although this study indicated that parents viewing their child as social value positively predicts adolescent depression, it does not mean that they are "bad" parents who will bring up depressed adolescents. For some parents, social VOC may be linked to an economic reality [11] that leads them, for survival purposes, to attach an economic value to the child. Thus, parents' social VOC is not conscious and voluntary, and parents do not deliberately choose to adopt it. Thus, a neutral and objective attitude toward each type of parental VOC is desirable in real life.

Implications

This study makes several theoretical contributions. First, we demonstrated that parents' VOC is an important construct that can predict adolescents' mental health, specifically, depression. Furthermore, this study introduces multiple mediations to enhance the theoretical framework regarding the role of parents' VOC in adolescent depression. It considers both external parenting factors and internal cognitive styles, thereby validating and enriching the systemic model of youth depression. Finally, it expands the boundary of parents' VOC in the study of adolescent mental health.

This study also has important practical implications. It clarifies the relationship between parents' VOC type and adolescents' cognitive style. More importantly, it addresses the association of parents' implicit attitudes when raising children with adolescent depression and helps inform the attitudes or beliefs that they should have. With the development of social modernization and the economy, parents' VOC has shifted from being based on utilitarian values to psychological values [12]. However, Chinese society has historically exhibited a pronounced son preference across multiple centuries [36]. It leads to some parents raising children mainly for social benefits, specifically, in villages [11]. However, parents' social VOC acts as a truism and is not under the voluntary and conscious control of the parents. Thus, our research does not blindly recommend parents to completely change their social VOC but helps them realize that a social VOC predicts greater adolescent depression and suggests that while paying attention to children's social values, it is better to endow them with more psychological value.

Limitations and future directions

Some limitations of this study should be noted. First, it investigated only parents who spend more time taking care of their children daily because some adolescents have single or divorced parents. Future research should assess participants whose parents are not divorced and examine the VOC of the father and the mother. Second, this study adopted a variable-centered perspective and considered the three types of VOCs as separate variables. However, a parent may hold all three types to varying degrees. Future studies could expand the focus to a person-centered perspective and conduct latent profile analysis to explore different latent types of parents'

VOC. Third, our model is limited in its ability to reveal the causality of the variables of interest because of the use of self-report measures. Experimental studies should be conducted to determine causality. Finally, the collected data were set in the Chinese cultural context. Cultural values and characteristics could play a role in the findings. China is characterized by high collectivism and parents' social and relational VOC may be universal. It may differ from the VOC found in the Western cultures of other countries. Therefore, caution is necessary when generalizing our findings to other cultural backgrounds. Future research should evaluate our models' generalizability in other cultural contexts.

Conclusion

Despite the importance of parents' VOC in family research, there is a notable scarcity of studies examining its role in adolescent mental health. In line with the systemic model of youth depression, we investigated this aspect from a health psychology perspective, exploring the relationship between parents' VOC and adolescent depression, as well as the underlying mechanisms. The results indicated that parents' social and psychological VOC were associated positively and negatively with adolescent depression respectively. Emotional warmth, rejection, or external LOC served as the underlying mechanism linking parents' social, and psychological VOC and adolescent depression, and this psychological underlying mechanism was conditioned by sex. This study enriches the theoretical research on family factors and adolescent mental health. It provides practical guidance to curb the incidence of adolescent depression in early childhood from the perspective of parents.

Abbreviations

VOC	Value of Children
LOC	Locus of control
PSV	Parents' social VOC
PPV	Parents' psychological VOC
PRV	Parents' relational VOC
REJ	Rejection
DEP	Depression
EW	Emotional warmth
EL	External LOC

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s40359-025-02684-2.

Supplementary Material 1

Acknowledgements

We thank all the students, their parents and teachers for their cooperation in this survey.

Author contributions

D. D.: Designed the study, conceived the framework, analyze data, interpreted the results and drafted the manuscript. Y. F.: Frame the theoretical framework, drafted the manuscript, revised the manuscript and provided critical feedback. M. Z.: Conducted the study, collected data and controlled the quality of study. M. Z.: Provided critical comments in manuscript revision. P. Z.: Collected data. Z. Q.: Conceptualized the study, and revised the manuscript.

Funding

This study was funded by the National Social Science Foundation of China [20&ZD153]; and Ministry of Science and Technology of the People's Public of China [2020YFC0832402].

Data availability

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Institutional Review Board of Human Research Ethics Committee for the Faculty of Psychology at Beijing Normal University (No. 202004270038).

Consent for publication

Not applicable.

Informed consent

Informed consent was obtained from all participants, including adolescents and their parents. In addition, for adolescents under the age of 18, their parents also provided their children's informed consent.

Competing interests

The authors declare no competing interests.

Received: 12 August 2023 / Accepted: 2 April 2025
Published online: 18 April 2025

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