Effect of Mother's Educational Level on Depression in Children and Adolescents

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Abstract. To investigate the effect of mothers' education level on depressive symptoms in childhood and adolescence, this study was based on data from the 2018 China Family Panel Studies (CFPS) with children and adolescents aged 9-15 years old, and was conducted using SPSS for binary logistic and AMOS software for mediated effects analysis. The results showed that children's depression score (3.76±3.11) was lower than that of adolescents' (4.09±3.17), with a statistically significant difference (p=0.009). Mother's education level (OR=0.341, 95% CI:0.125-0.931) was a protective factor for depression in children, and the mediating effect of children's educational expectations was significant between the both, and mother's education level had no effect on depression in adolescents.

Keywords: Mothers' educational level; childhood; adolescence; depression; mediating effects

1 Introduction

It was found that 17.2% of children and adolescents in China reported depressive symptom [1]. More than half of mental health conditions begin in adolescence, but most cases are not identified and treated promptly in early adolescence [2]. Failure to address mental health issues not only affects academic performance [3], but also increases the risk of chronic illness and hereditary depression [4-5], and even leads to suicide [6].

The family is the initial place of individual socialization, and mothers play a primary caregiver role in the development of their children [7-8]. A growing number of studies have shown that increased parental education is usually associated with improved health status of children and adolescents, especially in mothers [7,9]. However, some studies have also demonstrated that there is no statistically significant association between mothers' education level and children's depressive symptoms [10].

As the structure of society changes, families' values show constant changes according to their economic strength and development goals. The influence of mother' education may change during childhood and adolescence [11]. Past research has focused on

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the benefits of mothers' education or theoretical studies on the mental health of children throughout adolescence. There is a lack of empirical evidence to examine the mechanisms by which mother' education plays a role in childhood and adolescence, respectively. For this reason, the aim of this study was to investigate the effect of mothers' educational level on children's depression in different periods of childhood and adolescence, and to introduce a mediating variable of children's educational expectations to provide ideas to prevent the development of depression in children and adolescents.

2 Subjects and methods

2.1 Study design

This study uses data from the China Family Panel Studies (CFPS) 2018, which is a tracking survey for academic purposes, with household and telephone interviews as the main forms. All aspects including project design, survey content, field implementation, and data processing have passed professional guidance and strict quality control, making it a high-quality and representative data.

2.2 Study subjects

Inclusion criteria: (1) aged 9~12 years in childhood and 13~15 years in adolescence (CFPS questionnaire considers 16 years or older as adults); (2) finished the complete depression scale independently. The individual questionnaire was matched with the family questionnaire, parent questionnaire and the family relationship questionnaire, and missing and abnormal data were reasonably excluded, resulting in a final sample size of 2466.

2.3 Study content

Four sections were included: basic demographic characteristics (gender, residence, family size, mother's marriage, peer relationships, and annual household income), mother's education level, children's educational expectations, and depression scale assessment. In this study, mothers' educational level was divided into four categories: elementary school or below, middle school, high school, and college and above. Children's educational expectations were also divided into four categories: compulsory education, high school, college and university, and master's degree or above. Depressive symptoms: The CES-D8 is an 8-item scale with 4 options for each item describing different levels of depressive symptoms, with scores ranging from 0 to 3, respectively. Studies have been conducted to reflect depressive symptoms with the help of this scale [12-13], indicating that the scale has good applicability in our study. Based on previous studies, we used a score of ≥9 to distinguish participants with depression from those who were relatively free of depression [14].

2.4 Statistical methods

Firstly, the measurement data were expressed as (x±s) and the enumeration data were expressed as number of cases and constitutive ratio. Secondly, multivariate binary logistic regression was used to explore the relationship between mothers' education level and depression in children and adolescents, respectively. Finally Bootstrap mediation effect was used to test the mediating role of children's educational expectations between mothers' educational level and children's depression. All statistical analyses were performed using IBM SPSS StatisticsV26.0, and $p < 0.05$ was considered statistically significance.

3 Results

3.1 Basic information of the study subjects

In this study, there were 2,466 participants, 1,268 of whom were 9~12 years old, of whom 557 were mothers with elementary education or below, 488 of junior high school, 131 of high school, 92 of college or above; 130 expected to finish compulsory education, 277 expected to finish high school, 726 expected to finish college and university, 135 expected to finish master's degree or above. There were 1198 participants aged 13~15 years old, 614 mothers with elementary education or below, 397 in junior high school, 117 in high school, and 70 in college and above; 96 cases expected to finish compulsory education, 363 expected to finish high school, 647 expected to finish college and university, and 92 expected to finish master's degree or above (Table 1).

Table 1. Comparison of depression with different characteristics

Variables	Age 9~12		Age 13~15	
	Normal (%)	Depression (%)	Normal (%)	Depression (%)
Gender				
Female	547(90.4)	58(9.6)	499(89.9)	56(10.1)
Male	617(93.1)	46(6.9)	593(92.2)	50(7.8)
Residence				
Urban	478(91.9)	42(8.1)	452(90.9)	45(9.1)
Rural	686(91.7)	62(8.3)	640(91.3)	61(8.7)
Family size				
<5	446(91.2)	43(8.8)	519(92.2)	44(7.8)
5~7	582(91.4)	55(8.6)	500(90.7)	51(9.3)
>7	136(95.8)	6(4.2)	73(86.9)	11(13.1)
Mothers' educational level				
Elementary school or below	500(89.8)	57(10.2)	556(90.1)	58(9.9)
Junior high school	452(92.6)	36(7.4)	364(91.7)	33(8.3)
High school	126(82.9)	5(17.1)	105(89.7)	12(10.3)
College or above	86(93.5)	6(6.5)	67(95.7)	3(4.3)
Mother's marriage				
Married	1114(92.1)	95(7.9)	1032(91.1)	101(8.9)
Divorced	38(82.6)	8(17.3)	31(91.2)	3(8.8)
Widowed	12(92.3)	1(7.7)	29(93.5)	2(6.5)

Annual household income				
<5	542(90.3)	58(9.7)	540(91.1)	53(8.9)
5~10	392(92.4)	32(7.6)	347(91.3)	33(8.7)
10~15	135(95.7)	6(4.3)	113(91.1)	11(8.9)
>15	95(92.2)	8(7.8)	92(91.1)	9(8.9)
Peer relationships				
Poor	126(82.9)	26(17.1)	80(78.4)	22(21.6)
Fair	78(91.8)	7(8.2)	74(89.2)	9(10.8)
Good	960(93.1)	71(6.9)	938(92.6)	75(7.6)
Educational expectations				
Compulsory education	108(83.1)	22(16.9)	81(84.4)	15(15.6)
High school	255(92.1)	22(7.9)	323(90.0)	40(10.0)
College and University	675(93.0)	51(7.0)	603(93.2)	44(6.8)
Master's degree or above	126(93.3)	9(7.7)	85(92.4)	7(7.3)

3.2 Detection rate of depression in children and adolescents

Depression was detected in 104 cases in children, with a detection rate of 8.2%, and in 106 cases in adolescents, with a detection rate of 8.8%. There was a statistically significant difference between the depressive symptom scores in childhood (3.76±3.11) and in adolescence (4.09±3.17) (p=0.009).

Table 2. Analysis of the differences in total depression scores at the childhood and adolescent

Periods	Number	Scores	*t*	*P*
Childhood	1268	3.76±3.11	-2.618	0.009
Adolescence	1198	4.09±3.17		

3.3 Binary logistic regression of mothers' education level and children's depression

Model A was the unadjusted effect of mothers' education level on child depression, and adjusted Model B showed that children whose mothers had a high school education (OR=0.341, 95% CI:0.125~0.931) had a relatively lower risk of depression compared to elementary school or below, and mothers' education at college or above was no longer associated with this reduced risk. At this time, divorce (OR=2.647, 95% CI:1.145~6.118) was a risk factor for depression in children, and peer relationships, family size, and children's educational expectations were protective factors against depression in children. And compared to girls, boys (OR=0.575, 95% CI: 0.377~0.879) had a lower risk of developing depression. In adolescence, mothers' educational level had no effect on adolescent depression (as shown in Models C and D). However, good peer relationships (OR=0.313, 95% CI:0.182~0.539) and college and university education expectations (OR=0.415, 95% CI:0.213~0.809) remained protective factors. Gender, marital status, family size and annual family income were no longer associated with adolescent depression (Table 3).

Table 3. Binary logistic regression of mother's education level and children's depression at different periods

Variables	Model A (9~12)		Model B (9~12)		Model C (13~15)		Model D (13~15)	
	OR	*95%CI*	*OR*	*95%CI*	*OR*	*95%CI*	*OR*	*95%CI*
Mothers' educational level	1		1		1		1	
Elementary school or below	0.699	0.452, 1.081	0.721	0.452,1.166	0.869	0.556, 1.359	0.872	0.542,1.402
Junior high school	0.348*	0.137,0.886	0.341*	0.125,0.931			1.248	0.597,2.610
High school	0.612	0.256,1.463	0.604	0.221,1.651	1.096	0.569, 2.110	0.530	0.144,1.948
College or above					0.429	0.131, 1.408		
Gender (Male)			0.575*	0.377, 0.879			0.685	0.452, 1.037
Residence (Rural)			0.847	0.528, 1.357			0.816	0.516, 1.288
Family size								
<5			1				1	
5~7			0.962	0.619, 1.495			1.162	0.748,1.806
>7			0.374*	0.150,0.930			1.508	0.716,3.178
Annual household income								
<5			1				1	
5~10			0.910	0.561,1.477			0.954	0.592,1.539
10~15			0.549	0.224,1.349			1.067	0.505,2.251
>15			1.192	0.509,2.788			1.140	0.509,2.552
Mother's marriage								
Married			1				1	
Divorced			2.647*	1.145, 6.118			1.063	0.314, 3.596
Widowed			0.481	0.055, 4.189			0.761	0.174, 3.326
Peer relationships								
Poor			1				1	
Fair			0.388*	0.156, 0.968			0.458	0.194, 1.081
Good			0.324**	0.194, 0.539			0.313**	0.182, 0.539
Educational expectations								
Compulsory education			1				1	
High school			0.419**	0.217, 0.807			0.718	0.369, 1.396
College and University			0.385**	0.217, 0.683			0.415*	0.213, 0.809
Master's degree or above			0.399*	0.139, 0.941			0.554	0.204, 1.506

Note: *P<0.05 **p<0.01

3.4 Analysis of the mediating effect of children's educational expectations between mothers' educational level and children's depression

To verify that the relationship between mothers' education level and children's depression was mediated by children's educational expectations. The Bootstrap method was further used to test the mediating effect, and the results (Table 4) showed that the total effect of mother's education on children's depression was -0.02(p=0.023) and the indirect effect was -0.005 (p=0.018), accounting for 25.0% of the total effect, both of which were statistically significant.

Table 4. Mediating effects of children's educational expectations

	Estimate	Indirect / Total	Lower	Upper	P
Indirect	-0.005	25	-0.011	-0.01	0.018
Total	-0.02	100	-0.039	-0.01	0.023

4 Discussion

In this study, the prevalence of depression was lower in childhood than in adolescence. This may be due to lower levels of depression in childhood as compared to adolescence because of less academic stress, exposure to simple and safe environments, and less psychological conflict [15].

Mothers with a high school education is associated with a lower risk of childhood depression in children, which is consistent with previous studies [16]. Children often adopt neglectful attitudes when their mothers are less educated [17], whereas the more educated a mother is, the more likely she is to spend time directly with her child. Higher educated mothers typically have higher incomes, are more likely to marry highly educated partners, and have relatively lower divorce rates, according to marriage matching theory [18].

Mothers also are better able to make safer and healthier lifestyle choices [19], access quality health care for themselves and their children [20], and engage in positive parenting practices through their educational experiences and extensive resources [21]. In turn, their children are more likely to grow up in homes, schools, and communities with higher resources, and these keep children on a healthy developmental trajectory [22]. In contrast, parental education beyond college is no longer associated with this reduced risk, suggesting that there may be other factors that would neutralize the potential protective effects of education. With the expanding world of children, in order to better accommodate their development, highly educated mothers spend less time interacting with them directly, more time planning and monitoring their academic and social networks, and protecting their children's mental health by building a good network of relationships outside the home [23].

In adolescence, mother's education is no longer associated with depression in children. This is inconsistent with Park [24] who concluded that mother's education is a strong predictor of depression in adolescent children. It is well known that during adolescence, children spend much less time with their parents than during childhood, and that parental control and influence decreases with age. In addition, peer groups and other school-related factors enter the lives of adolescents and influence their behavior and mental health [25-26]. This explains why the mother's level of education, has a greater impact on the child than on the adolescent's mental health.

In general, the mother's education level does not change much after the child is born. Therefore, they will be "exposed" to the same level of mother's education throughout their lives. However, this study found that the mother's level of education had different effects on the child's mental health at different times. This finding may be explained by the fact that the mother's interaction with her children derives other educational resources, values and attitudes related to children's mental health through her level of education[27]. In this study, children's educational expectations mediated the relationship between mothers' educational level and children's depression. Influenced by the value that knowledge changes destiny in our country, good educational expectations translate into achievement motivation in children, increasing their self-confidence and reducing the occurrence of depression. In contrast, mothers with higher educational level have higher educational expectations for their children [28] and subconsciously

influence their children's academic goals and educational expectations by directing them to engage more in academically oriented activities such as doing homework, reading, and academic conferences.

In addition, this study also found that girls were more likely to develop depression compared to boys. This is consistent with previous studies [29]. On the one hand, biopsychologically, females respond more negatively to stress [30]; on the other hand, residual sociocultural barriers [31-32] lead to gendered parenting styles that exacerbate the psychological burden of adolescents with brothers in the family. The absence of a direct effect of annual family income on child-adolescent depression implies that the mere lack of financial resources is not important. That is, higher income does not significantly improve children's health once their basic needs are met [33]. Maintaining good relationships with peers is always a protective factor for children's depression, both in childhood and adolescence.

5 Conclusions

In conclusion, although the mother's education level had a small effect on child depression in this study, it was still influential. It is not feasible to conclude that higher education is necessary for all females, the issue is to identify other indicators that are closely related to adolescent mental health through maternal education in order to promote healthy child and adolescent development.

References

1. Xu DD, Rao WW, Cao XL, et al. Prevalence of depressive symptoms in primary school students in China: A systematic review and meta-analysis [J]. J Affect Disorders, 2020,268:
2. 20-27. DOI:10.1016/j.jad.2020.02.034.
3. Malla A, Shah J, Iyer S, et al. Youth mental health should be a top priority for health care in Canada [J]. Can J Psychiatry, 2018, 63(4):216–222. DOI:10.1177/0706743718758968.
4. Wu XL, Gai XS. The bivariate relationship between adolescent well-being, depression and academic performance: A cross-lagged study[C]//.Proceedings of the Twenty-first National Psychology Conference. [publisher unknown], 2018:395-396.
5. George CP, Susan MS, John SS, et al. Our future: a Lancet commission on adolescent health and wellbeing [J]. Lancet, 2016, 387(10036). DOI:10.1016/S0140-6736(16)00579-1.
6. Williams L, Zhang RL, Kevin CP. Factors affecting the physical and mental health of older adults in China: The importance of marital status, child proximity, and gender [J]. Ssm-Popul Hlth, 2017, 3(C). DOI:10.1016/j.ssmph.2016.11.005
7. Curtin SC, Warner M, Hedegaard H. Increase in Suicide in the United States,1999-2014[J]. NCHS Data Brief, 2016(241).
8. Alan CM, Irina BG. Education and family health care spending [J]. South Econ J, 2018, 85(1). DOI:10.1002/soej.12300
9. Sharma G, Wotipka CM. Mothers' gendered aspirations for their children: a case study of Forbesganj, Bihar [J]. Compare,2019,49(3):358–374. DOI:10.1080/03057925.2017.1412252.

10. Mensch BS, Chuang EK, Melnikas AJ, et al. Evidence for causal links between education and maternal and child health: systematic review[J].Trop Med Int Health, 2019, 24(5).
11. DOI:10.1111/tmi.13218
12. Sheikh MA, eAbelsen B, Olsen JA. Clarifying associations between childhood adversity, social support, behavioral factors, and mental health, health, and well-being in adulthood: A population-based study[J].Front Psychol, 2016, 7. DOI:10.3389/fpsyg.2016.00727
13. Meyrose AK, Klasen F, Otto C, et al. Benefits of maternal education for mental health trajectories across childhood and adolescence[J].Soc Sci Med, 2018, 202. DOI:10.1016/j.
14. socscimed.2018.02.026
15. Liao YG, Lian R. Analysis of potential transitions in depressive symptoms in adults: a four year follow-up study[J]. Chinese Journal of Clinical Psychology, 2020,28(03):518-522. DOI:10.16128/j.cnki.1005-3611.2020.03.018.
16. Zhao XH, Ruan HQ. Socio-economic gradient of depressive symptoms among Chinese adults--Based on data from the China Family Panel Studies in 2014 and 2016[J]. Beijing Social Science,2019(08):34-47.DOI:10.13262/j.bjsshkxy.190804.
17. Briggs R, Carey D, O'Halloran AM, et al.Validation of the 8-item Centre for Epidemiological Studies Depression Scale in a cohort of community-dwelling older people: data from The Irish Longitudinal Study on Ageing (TILDA)[J]. Eur Geriatr Med, 2018, 9(1). DOI:10.1007/s41999-017-0016-0.
18. Ji D, Chen H, Cao M, et al. Effects of family atmosphere and parental education on adolescent depression[J]. China Public Health,2018,34(01):38-41.
19. Chen PJ, Mackes N, Sacchi C, et al. Parental education and youth suicidal behaviours: a systematic review and meta-analysis[J].Epidemiol Psychiatr Sci, 2022, 31(19). DOI:10.1017/S204579602200004X.
20. Padilla-Moledo C, Ruiz J R, Castro-Piñero J. Parental educational level and psychological positive health and health complaints in Spanish children and ad olescents [J].Child Care Health Dev, 2016, 42(4). DOI: 10.1111/cch.12342.
21. Niu JL.The effect of couples' educational matching on men's equal sharing of household chores[J]. Population and Economics,2017(02):32-41.
22. Emily HC, Maslowsky J.Teen mothers' educational attainment and their children's risk for teenage childbearing[J]. Dev Psychol, 2019, 55(6). DOI: 10.1037/dev0000705.
23. Maharatha TM, Dash U. Inequity in health care utilization for common childhood illnesses in India: measurement and decomposition analysis using the India demographic and health survey 2015–16[J]. BMC Health Serv Res, 2021,21(1). DOI:10.1186/S12913-021-06887-2
24. Li Q. The influence of family education on the development of elementary school students' self-awareness[J]. Journal of Science and Education (Upper Edition),2020(13):158-160.
25. DOI: 10.16400/j.cnki.kjdks.2020.05.076.
26. Hendrick C, Maslowsky J. Teen Mothers' Educational Attainment and Their Children's Risk for Teenage Childbearing[J]. Dev Psychol, 2019, 55(6). DOI: 10.1037/dev0000705.
27. Kalil A, Ryan R, Corey M.Diverging destinies: maternal education and the developmental gradient in time with children[J].Demography, 2012, 49(4):1361-1383. DOI:10.1007/s
28. 13524-012-0129-5
29. Park AL, Fuhrer R, Quesnel-Vallée A. Parents' education and the risk of major depression in early adulthood [J]. Soc Psychiatry Psychiatr Epidemiol, 2013, 48(11). DOI:10.1007/s.
30. 00127-013-0697-8
31. Oberle E, Guhn M, Gadermann AM, et al. Positive mental health and supportive school environments: A population-level longitudinal study of dispositional optimism and school relation- ships in early adolescence[J]. Soc Sci Med, 2018, 214. DOI:10.1016/j. socscimed.
32. 2018.06.041

33. Wang MY. The effect of adolescent exercise behavior on depressive tendencies: mediating effects based on motivation and subjective experience[J]. Sports and Science, 2021, 42(06):78-85+110. DOI:10.13598/j.issn1004-4590.2021.06.012.
34. Erola J, Jalonen S, Lehti H. Parental education, class and income over early life course and children's achievement[J]. Res Soc Stratif Mobil,2016,44 DOI:10.1016/j.rssm.2016.01.003.
35. Li B. The impact of parental involvement on children's development-a perspective based on academic achievement and non-cognitive abilities[J]. Education and Economics. 2018,
36. (3):54－64.
37. Chen WL, Huang Y, Riad A. Gender Differences in Depressive Traits among Rural and Urban Chinese Adolescent Students: Secondary Data Analysis of Nationwide Survey CFPS[J]Int J Environ Res Public Health, 2021, 18(17). DOI:10.3390/ijerph18179124.
38. Lavinia ML, Gaul D, Penco R. Perceived Social Support and Stress: a Study of 1st Year Students in Ireland. [J]. Int J Ment Health Addict,2022 (prepublish). DOI: 10.1007/s11469-021-00710-z.
39. Gordon R. 'Your mind becomes open with education': exploring mother's aspirations for girls' education in rural Bihar[J]. Compare, 2021. DOI:10.1080/03057925.2021.1976616.
40. Alcaraz M. Beyond Financial Resources: The Role of Parents' Education in Predicting Children's Educational Persistence in Mexico[J]. Int J Educ Dev, 2020, 75(C). DOI:10.1016/j.ijedudev.2020.102188.
41. Min KK, Sun CU. Can Money Buy Happiness for a Family? Family Income, Parenting Style, and Life Satisfaction in Parents and Adolescents[J]. Clin Child Psychol Psychiatry, 2021, 26(3). DOI:10.1177/13591045211000781.