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Prenatal anxiety associated with male child preference among expectant mothers at 10–20 weeks of pregnancy in Xiangyun County, China

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Abstract

Objective—To examine the relationship between male child preference and maternal prenatal psychological distress among expectant mothers from Xiangyun County, Yunnan Province, China.

Methods—Child gender preference, state-trait anxiety and depression, relationships with the husband and mother-in-law, and self-esteem were measured in a sample of 198 women between 10 and 20 weeks of pregnancy. Multivariate logistic regression analysis was used to identify risk factors for prenatal anxiety.

Results—Prenatal anxiety was correlated with male child preference ($r = 0.15$, $P < 0.05$), maternal age ($r = -0.17$, $P < 0.05$), level of education ($r = -0.23$, $P < 0.01$), self-esteem ($r = -0.36$, $P < 0.01$), relationship with mother-in-law ($r = -0.34$, $P < 0.01$), and relationship with husband ($r = -0.35$, $P < 0.01$). Significant relationships were maintained in multivariate analysis that included gender preference, maternal education, pregnancy anxiety, self-esteem, number of people in the household, and relationship with husband as predictors (adjusted $r^2 = 0.28$, $P < 0.001$).

Conclusion—Male child preference was associated with prenatal anxiety in this sample. Younger maternal age, lower self-esteem, lower level of education, worse relationship with husband, and less family cohesiveness were also related to prenatal anxiety. Expectant mothers experienced prenatal anxiety when there was strong family preference for sons.

Keywords

China; Daughter discrimination; Depression; One child policy; Prenatal state-trait anxiety; Sex selection; Son preference

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Conflict of interest

The authors have no conflict of interest to declare.

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1. Introduction

Gender preference for male children and the undesirability of female children persists in many parts of the world, including the populous nations in east, south, and south-east Asia, the Middle East, and Africa [1]. The effects of this preference on the survival and development of daughters are indirectly demonstrated by imbalanced sex ratios at birth, contraceptive practices in relation to sex composition of children in the family, gender disaggregation of infant and child mortality rates, nutritional status, physical development, and differential access to education and health facilities [2].

In China, the “one child policy” is thought to heighten the pressure for many families, especially those living in rural areas, to produce a male child [3]. The one child policy was implemented in 1979, and the rule applies primarily in urban areas where families are restricted to only 1 child. In rural areas, home to approximately 70% of the Chinese population, families are generally allowed to have 2 children spaced 5 years apart owing to the government’s acknowledgment of the traditional preference for boys. One sign of the preference for a male child is evidenced by the sex ratio at birth (SRB). In the 1960s and 1970s, the SRB in China was very close to 106 boys for every 100 girls [4], which is close to the normal value in most populations. The SRB peaked at 124 boys for every 100 girls in the 2000–2004 cohort [5], and recent data from 2007 indicate a ratio of 120 boys for every 100 girls [6]. The disproportionate SRB indirectly reveals that much more is at stake for parents to take additional measures to increase their chances of having a boy, but the SRB does not provide information on the direct implications of male child preference for individuals and their families. By Confucian tenets, it is the mother’s role to give birth to a male heir, and her “ability” to do so confers status in the community and society [7]. The risk of postpartum depression is increased in Chinese women who give birth to a female infant compared with those who give birth to a male infant [8]. In the prenatal period, however, the effects of family preference for a male child on women’s mental health status remain unclear.

Impaired maternal emotional well-being during pregnancy has been associated with a broad range of negative outcomes for the child, including insecure attachment, behavioral disturbance at home, social patterning of play in school, and aggression [9,10]. Prenatal anxiety is studied infrequently, but recent findings indicate that symptoms of anxiety are relatively common during pregnancy and after birth [11]. Prenatal anxiety is predictive of postpartum depression [12], and it has been suggested that depression and anxiety are different points along a continuum, with initial anxiety turning to depression when relief is not forthcoming.

Prenatal anxiety and depression share similar sociodemographic and socioeconomic risk factors, which suggests that some common environmental stressors may be involved [13]. Risk factors for prenatal anxiety include psychosocial variables, such as lower educational level, younger maternal age, poorer self-esteem, and lower marital satisfaction. Predispositions to prenatal depression may also be culture specific, and hence should be delineated within the cultural context [14].

The aim of the present study was to investigate the relationship between child gender preference and prenatal symptomatology of anxiety and depression in a sample of rural Chinese women. In the context of male child preference and birth restriction, the sociodemographic variables, family relationships, and maternal attributes that are associated with maternal prenatal psychological distress were evaluated.

2. Materials and methods

A total of 198 pregnant women were recruited from the Maternal Child Health facilities in Xiangyun County, Yunnan Province, between August 1, 2008 and May 31, 2009. The study

was approved by the Institutional Review Boards of UCLA and Kunming Medical University, and informed consent was obtained from all participants. Eligible participants were between 10 and 20 weeks of pregnancy, were literate, and could understand consent forms and procedures. Inclusion criteria for the participants were singleton pregnancy; residence in the county; no history of diabetes mellitus, hypo- or hyperthyroidism, or hypertension; and a non-smoker. The majority of mothers (93%) were expecting their first child, and all the pregnancies were wanted. Pregnant women who agreed to participate were interviewed and requested to complete questionnaires. One-hour appointments were made with participants, and the interviews were conducted in closed rooms to maintain privacy and confidentiality. Data on sociodemographic variables were obtained from the participants. Before completing the questions related to fetal gender, the interviewer built rapport with the participants by conversing with them and gathering the sociodemographic data.

The Gender Preference Scale was designed by the authors as a culturally appropriate instrument for the present study. It takes into account the mothers' perspectives on their husband's and mother-in-law's wishes, as well as the perceived values of having boys versus girls in the family. The 16 questions in the interview assessed: the mother's child gender preference; the strength of the preference; and the mother's thoughts on her husband's (i.e. the father's) gender preference. The women were asked what they thought about their husband's wish irrespective of whether they themselves had expressed a wish for a boy or girl. If the mother reported that they just wished for a healthy child, or it did not matter to them whether the newborn was a boy or girl, the interviewer proceeded to ask the participant her thoughts on her husband's wish. The questionnaire also covered the strength of the husband's gender preference; the mother's thoughts on her mother-in-law's gender preference; the strength of the mother-in-law's gender preference; the advantages of having boys in the family; the advantages of having girls in the family; the mother's interpretation of the idiom "chuan zong jie dai," which refers to propagation of the family lineage [15]; the mother's thoughts on her husband's belief in "chuan zong jie dai"; the mother's thoughts on her mother-in-law's belief in "chuan zong jie dai"; the effects of her husband's wish on the mother's child gender preference (congruence or discord for boy or girl preferences was scored); the effects of the mother-in-law's wish on the mother's child gender preference (congruence or discord for boy or girl preferences was scored); the mother's thoughts on whether the responsibility for taking care of elderly parents rests with sons or daughters; the mother's thoughts on what would happen if she had only sons (no daughters) in the family; and the mother's thoughts on what would happen if she had only daughters (no sons) in the family.

Scores were based on a 3-point scale indicating boy child preference (+1), no preference (0), and girl child preference (−1), except for the questions on strength of preference, which were scored on a 7-point scale. The total score was obtained by adding the individual item scores (range for total score: −21 to +21); positive scores indicate a greater male child preference. Neutrality (no preference) toward child gender from the mother's perspective was scored as 0; if the mother perceived that the child gender outcome did not matter to herself, her husband, or her mother-in-law, and her statements about the role and impact of child gender outcome indicated gender neutrality, the summed score would be 0. If the mother placed a lower valuation for girls in the family, the summed score would be below 0 in terms of male child preference. As the extent of male child preference was scored for each question with centering at 0, there was an additive effect and higher scores were reflective of greater male child preference. The Cronbach alpha coefficient in the present study was 0.69.

The Spielberger State-Trait Anxiety Inventory for Adults (STAI) was used to measure the state of anxiety (response to present circumstance) and trait of anxiety (predisposition to be anxious) [16]. The two subscales (state and trait) each contain 20 statements of feelings. This scale has been demonstrated to have high concurrent validity (0.52–0.8) with other well-known anxiety

measures. The scale has been found to be reliable and valid in Chinese populations, including pregnant women. The Cronbach alpha in this present study was 0.79.

Depressive symptomatology was assessed using the Center for Epidemiologic Studies Depression Scale (CESD) [17]. This scale consists of 20 items that measure the cognitive, affective, behavioral, and somatic symptoms associated with depression. Possible scores range from 0 to 60, and higher scores reflect higher levels of depressive symptomatology in the past week. The scale has convergent validity with other measures of depression, and has been validated in the Chinese cultural setting. In the present study, the alpha coefficient was 0.76.

The Rosenberg Self-Esteem Scale (SES) [18] is a widely used measure of self-esteem, which has been used in the Chinese cultural context. Each item is rated on a 4-point scale, and total scores range from 10 (highest self-esteem) to 40 (lowest self-esteem). In the present study, the alpha coefficient was 0.69.

A structured interview consisting of 5 questions was used to assess the mother's relationship with her husband. Questions were culturally adapted from the Dyadic Adjustment Scale [19] and the Comprehensive Marital Satisfaction Scale [20], and items were worded in terms of "how often" and "how satisfied" instead of degree of agreement/disagreement, and statements carried positive or negative connotations about the relationship. A score ranging from 5 to 20 was obtained; a high score indicates a better relationship with the husband. The mother's relationship with her mother-in-law was assessed using a structured interview consisting of 5 questions, adapted from and comparable to the relationship with the husband scale. The alpha coefficients for relationship with husband and relationship with mother-in-law were 0.67 and 0.61, respectively, in the present study.

Descriptive statistics were computed using mean and standard deviations for continuous data and frequencies for nominal data. We examined the bivariate relationship between prenatal state of anxiety, gender preference, and other potential predictors of anxiety, including socioeconomic status and psychosocial variables (maternal age, level of education, log-transformed family income, occupation, maternal role in financial decision making, number of people in the household, self-esteem, and relationships with husband and mother-in-law). Variables that were significantly related to state anxiety at a significance level of 0.05 using either a Spearman correlation (for comparing a continuous variable) or a Kruskal–Wallis test (for comparing a categorical variable) were considered in the construction of a multivariate regression model. A manual step-wise approach, starting from the full model and removing the least significant covariates, was used to develop the final model, in which variables with significance of 0.05 were retained. All variables included in the final regression model were assessed for approximate normality. Linear regression assumptions were checked using residual versus fitted, normal QQ, and Cook's distance plots.

3. Results

The sociodemographic characteristics of the study participants are presented in Table 1. All participants were married (none was divorced or re-married). The majority of mothers (59%) and fathers (63%) had junior high (secondary) school education. Most families were engaged in agriculture (61% of mothers and 49% of fathers identified farming as their occupation). On average, there were 4 people in each household; the expectant mother usually lived with her husband, parents-in-law, and her husband's younger siblings.

The correlation matrix based on prenatal state anxiety and depressive symptoms (CESD scores) is presented in Table 2. Primiparous participants (7% in this sample who had given birth to a previous child and were expecting their second child) had a preference for boys (3.4 ± 2.8 , t

test $P < 0.01$), whereas nulliparous women (93%) had a neutral preference (-0.1 ± 4.6 t test $P = 0.69$).

Results of multivariate regression analysis are presented in Table 3. Significant relationships were maintained for gender preference, maternal education, self-esteem, number of people in the household, and mother's relationship with the husband as predictors (adjusted $r^2 = 0.28$, $P < 0.001$).

4. Discussion

Among expectant mothers in this sample from rural mainland China, male child preference was associated with prenatal anxiety. A linear regression model with maternal education, relationship to husband, male child preference, self-esteem, and number of people in the household accounted for 28% of the variance in the prenatal state of anxiety. This study highlights the sociocultural factors that are associated with prenatal anxiety. Specifically, male child preference under conditions of birth restriction is related to higher prenatal anxiety. The implications are that the pressure from families on the mother to conform to societal and family expectations by producing a male "heir," leads to maternal anxiety during pregnancy. On the basis of the accumulating evidence of the adverse effects of maternal anxiety on fetal well-being, postnatal maternal mood, mother-child interaction, brain development, and the child's behavioral and developmental outcomes [21,22], the roles of social policies and sociocultural contextual variables in mediating prenatal maternal stress warrant further investigation.

Gender preference and the manifestations of sex preferential behavior are expected to be intrinsically influenced by family, community, and sociocultural norms and expectations and should not be considered solely the result of parental desires or biases. Maternal psychological distress might arise from the mother's internal conflict with expectations of the family, community, and society. This pressure is probably higher in the more closely knit kinship systems of rural China, which may promote increased scrutiny by relatives and neighbors and increased pressure to adhere to traditions.

The disparity in living standards between rural and urban areas in China is widely recognized. Although the urban population is generally more highly educated and less dependent on male children for financial security and self-sustenance, bearing a male child continues to indicate higher status in Chinese society, and male child preference has been detected at subtle levels among urban women with high levels of education [23]. In the present study based on a rural cohort, the net preference was for males even though 93% of the women were nulliparous, expecting their first child, and hence would have a second chance to bear a male child. The association between male child preference and prenatal anxiety remained when the small subset of primiparous participants (7%) was excluded from the analysis. Our findings point toward the direct effects of male child preference on prenatal maternal psychological distress in this sample consisting mostly of nulliparous participants. Future work focusing on the second (and last) pregnancy will be pursued, wherein the effects of male child preference on prenatal maternal anxiety are expected to be greater.

Consistent with previous research [24,25], psychosocial variables, including low level of education, young maternal age, poor self-esteem, and less congruent relationships with the husband and mother-in-law were also associated with prenatal anxiety. We also found that a larger household size was associated with reduced prenatal anxiety. Larger households often indicate poverty in urban, western, or westernized communities, which can be associated with a more stressful environment. In Chinese culture, however, multigenerational households (i.e. grandparents and/or great-grandparents living with all descendants) are favored by tradition, as they are symbolic of filial affinity, and greater family harmony. Thus, living with members

of the extended family does not entail a “loss of face” for poor families and, on the contrary, could be a source of pride. The benefits of family solidarity in larger rural Chinese households may serve as a protective factor against mental health disorders [26].

Depressive symptoms were associated with self-esteem and relationships with husband and mother-in-law, but not with male child preference. Although self-esteem has consistently been found to be associated with depression and anxiety during all stages of pregnancy [27] and the support of the husband and mother-in-law are important protective factors against stressors throughout pregnancy [28], the emotional aspect of male child preference appears to be relevant to anxiety but not to depressive symptoms in the early and mid trimesters. This finding is in line with the perspective that anxiety is anticipatory, arising from perceived inadequacy in meeting prenatal and postpartum demands, whereas depression may be more closely related to pragmatic demands of pregnancy and motherhood.

The study had several limitations. The cross-sectional data could not reflect changes in prenatal anxiety and depression over the course of pregnancy. In a large and populous country such as China, the representativeness of any study sample for which detailed data are collected faces limitations. The sample included only 13 women with second pregnancies, for whom male child preference was more evident. It is anticipated that stronger relationships between male child preference and prenatal anxiety and depression may be detected in future studies that include more women with second pregnancies, especially if their first child is a girl.

In summary, a predisposition to prenatal anxiety can be interpreted in a sociocultural context. In this study based on a rural Chinese sample, maternal prenatal anxiety was detected in families with a net preference for male children. Prenatal anxiety was also associated with lower self-esteem, lower level of education, a worse relationship of the mother with the husband, and less family cohesiveness. The findings suggest that birth restriction policies at the level of society have implications for social acceptance within the community, maternal conformity to social mores, family relationships, and women’s mental health. The role of social policies and sociocultural contextual variables in mediating these effects deserve further investigation.

Synopsis

Male child preference was associated with prenatal anxiety in a sample of pregnant women in rural China.

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Table 1Demographic characteristics of the study population (n=198) ^a

Characteristics	Value
Age of mother, y	23.2 ± 3.0 (18–34)
Age of husband, y	26.6 ± 3.4 (21–36)
Duration of pregnancy, wk	15.9 ± 2.4 (11–20)
Income per annum	
Chinese RenMingBi	26 700 ± 18 039 (1000–150 000)
US dollars	3909 ± 2641 (146–21 961)
Number of people in household	4.3 ± 1.3 (2–9)
Level of education of mother ^b	
Elementary school	0 (0)
Junior high school	115 (59.0)
High school or junior vocational school	45 (23.1)
Vocational college	22 (11.3)
University and above	13 (6.7)
Level of education of husband ^b	
Elementary school	0 (0)
Junior high school	116 (62.7)
High school or junior vocational school	38 (20.5)
Vocational college	14 (7.6)
University and above	17 (9.2)
Occupation of mother	
Farming	120 (60.6)
Commerce/business	9 (4.6)
Manual labor	7 (3.5)
Civil service	5 (2.5)
Clerical/office work	6 (3.0)
Technical work	1 (0.5)
Self-employed	9 (4.6)
Unemployed	10 (5.1)
Teaching	14 (7.1)
Others	17 (8.6)
Occupation of husband	
Farming	97 (49.0)
Commerce/business	15 (7.6)
Manual labor	21 (10.6)
Civil service	6 (3.0)
Clerical/office work	7 (3.5)
Technical work	6 (3.0)
Self-employed	9 (4.6)
Unemployed	3 (1.5)

Characteristics	Value
Teaching	9 (4.6)
Others	25 (12.6)

^aValues are given as mean $\pm$ standard deviation (range) or number (percentage).

^bThere were missing data on educational levels.

Table 2
Correlation matrix based on prenatal state anxiety and depressive symptomatology

	Gender preference	Maternal age	Maternal education	Log income	Relationship with husband
State of anxiety	0.145 ^a	-0.165 ^a	-0.234 ^b	-0.149 ^a	-0.350 ^b
Depression (CESD)	0.083	-0.052	-0.127	0.012	-0.217 ^b

^a $P<0.05$,
^b $P<0.01$.

Table 3

Regression model with state anxiety as the dependent variable

	Unstandardized coefficients	Standard error	Standardized coefficients (beta)	t	Significance
(Constant)	92.38	6.58		14.05	<0.001
Maternal education	-2.22	0.62	-0.23	-3.58	<0.001
No. of persons in household	-1.27	0.45	-0.18	-2.82	0.005
Relationship with husband	-0.90	0.27	-0.21	-3.34	0.001
total score					
Self-esteem	-0.91	0.19	-0.30	-4.70	<0.001
Gender preference	0.27	0.12	0.14	2.18	0.031

Overall model: $r = 0.55$; $r^2 = 0.30$; Adjusted $r^2 = 0.28$; $F(5188) = 16.02$ ($P < 0.001$).