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Gender Differences in the Incidence and Related Factors of Low Social Support among Adolescents with Subthreshold Depression

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ABSTRACT

Background: Social support is related to depression, but the gender differences and related factors that contribute to low social support among adolescents with subthreshold depression remain to be elucidated. This study explores the relationship between social support and depression, in addition to the gender difference in the incidence of low social support among adolescents with subthreshold depression and its related factors. **Methods:** A total of 371 Chinese adolescents with subthreshold depression were recruited. All subjects were rated on the Social Support Scale for Adolescents, the Response Style Scale, the Self-Perception Profile for Children, the Individualism-collectivism scale. **Results:** Binary logistic regression indicated that the stability dimension of cognitive style, the generality dimension of the Cognitive Style Questionnaire, and the social acceptance dimension of the Self-Perception Profile for Children scale were significantly correlated with social support level in male adolescents with subthreshold depression. In contrast, the total score of the Self-Perception Profile for Children scale, the social acceptance of the Self-Perception Profile for Children scale, total individualism, and total collectivism were significantly correlated with social support level in female adolescents with subthreshold depression. **Limitations:** This study is a cross-sectional study, and its effectiveness in explaining factors that influence levels of social support is limited. **Conclusions:** The gender difference between low social support among adolescents with subthreshold depression is related to cognitive style, self-perception, and collectivism-individualism.

KEYWORDS

Gender difference; subthreshold depression; social support; self-perception; cognitive style

Introduction

In recent years, subthreshold depression has gained considerable attention [1]. An increasing number of adolescents in China have started to report depressive symptoms [2]. Subthreshold depression is defined as clinically significant depressive symptoms that do not meet the diagnostic criteria for major depressive disorder [3]. Subthreshold depression is known to be a risk factor for depression [1]. The incidence of major depressive disorder (MDD) in people with subthreshold depression is higher than that in people without subthreshold depression [4]. Therefore, studies need to examine how adolescents suffering from subthreshold depression cope with

typical stressors, such as school examinations, family conflicts, and poor peer relations.

Social support is likely one of the most important resources in adolescents' coping process. There has been increasing evidence suggesting that social support and negative life events are important factors influencing the development and course of depression [5]. The results from previous studies indicate that social support exerts a main effect on levels of depressive symptoms experienced by adolescents [6,7]. Furthermore, epidemiological data indicate that subthreshold depression was more prevalent in female individuals [8]. Social support is correlated with the degree of depression, and this correlation is affected by



gender [9,10]. Compared with male individuals, female individuals have larger and more intimate social networks [9]. Concerning subthreshold depression, female adolescents displayed a higher rate of depressive mood and sleep problems, whereas male adolescents had greater anhedonia, problems related to concentration, and psychomotor retardation/agitation [10,11].

Two of the most prominent vulnerability to depression models that has proven useful in understanding the development of depression in adolescents are the cognitive vulnerability-stress perspective [12] and cultural vulnerability theories [13]. Specifically, a growing body of research suggests that self-perception, cognitive factors, and cultural processes are related to depression with low social support [10,14]. In the following sections, we describe three sets of potential factors that appear to be related to depression with low social support: negative cognitive style, self-perception, and individualistic and collectivist tendencies.

The first factor concerns the effect of negative cognitive styles. Among the hopelessness theory, a major vulnerability factor for depression is negative cognitive styles [15]. Cognitive styles contributed significantly to depressive symptoms [16]. A study reported that individuals who exhibit negative cognitive styles would be more likely to have more severe depressive episodes [17]. Previous studies have noted that negative post-traumatic cognitions are associated with negative attitudes about using social support, and these negative attitudes are related to perceptions of social support [18]. Concerning gender differences, previous studies have found that an individual's dispositional cognitive style differentiates between typical male and female individuals [19]. A previous study reported that male individuals have a higher systemizing cognitive style than female individuals [20].

The second factor is the impact of self-perception. Şahin et al. [21] reported that depressed patients had significantly more negative self-perception. Previous studies have reported that less severe depressive symptoms can be predicted by a positive self-perception [21]. We speculate that positive self-perceptions may help people seek social support more easily and, therefore, have lower levels of depression than those with negative self-perceptions. A significant proportion of existing studies indicate that social support may have a causal impact on self-perception [22]. Research in this area has suggested that both perceived social support and the quality of social relationships are associated with higher self-perception among adolescents [22]. When adolescents report high levels of social support, they are likely to have higher levels of self-perception [22]. Concerning gender differences, previous studies have found that when it comes to the accuracy of their self-perception, male individuals in general tend to overestimate themselves as opposed to female individuals, who tend to either accurately estimate or underestimate their abilities [23,24].

The third factor is the role of individualistic and collectivist tendencies. Some previous studies suggested that depression reflect individual differences in mental condition as predictors of individualism are significant [25]. This study also found that high collectivism is significantly associated with strong social support and prosocial

tendencies [25]. Preliminary research has noted significant individualistic and collectivist tendencies related differences in adolescents' depression [26,27]. In addition, previous studies have indicated that male individuals exhibit a higher vertical individualism than female individuals in individualistic societies, whereas no difference was observed between male and female individuals in collectivistic societies [28]. However, this gender difference varies from study to study in different age groups. For example, male adolescents revealed more horizontal individualism than female adolescents, and no difference was identified between male and female young adults [28]. Few studies on individualism and collectivism have attempted to investigate gender differences in adolescents with subthreshold depression. Therefore, it is necessary to conduct a study to account for gender differences and the relationship between individualistic and collectivist tendencies in social support among adolescents with subthreshold depression.

However, fewer studies to date have investigated the gender differences in the incidence of low social support among adolescents with subthreshold depression and related factors. This study aimed to explore gender differences in the incidence and related factors of low social support among adolescents with subthreshold depression. Taking into account the gender differences in social support and the vital role of social support in depression, this study aimed to explore gender differences in the incidence and related factors of low social support among adolescents with subthreshold depression.

Methods

Subjects

To recruit adolescent subjects with subthreshold depression, we screened 1,150 students from five middle schools in China. The response rate exceeded 95%. The final sample of adolescents with subthreshold depression comprised 371 students aged 14 to 19 years (205 girls and 166 boys, 1 missing data) ($M = 16.34$, $SD = 0.96$). Concerning ethnicity, 98.6% of participants were Han Chinese, and 1.4% were members of an ethnic minority.

According to the criteria recommended by Forlani et al. [8], the sample of adolescents with subthreshold depression had to meet the following criterion: all participants had to experience subthreshold depression (according to the Center for Epidemiological Studies Depression Scale score ≥ 36). All participants were interviewed using the structured clinical interviews using the Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition) (DSM-V) to eliminate potential affective disorders and other current Axis I disorders. Participants who did not meet the Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition) criteria were excluded, as were participants exhibiting the following conditions: (1) diagnosis of severe depression, bipolar disorder, or psychotic disorder as determined by two licensed psychiatrists; (2) previous use of psychiatric medications; and (3) any suicidal tendencies that pose a direct threat to the life of the subject, as determined by a licensed psychiatrist in a clinical interview, by specifically

endorsing a notable suicidal risk (according to a Beck Depression Inventory Item 9 score >1).

Measurements

Social Support Scale for Adolescents [29]

The Social Support Scale for Adolescents (SSSA) is a self-report scale assessing perceived social support. SSSA items reflect three dimensions: (1) parents' support, (2) friends' support, and (3) classmates' support. Each item is rated on a scale ranging from 1 to 4, with lower scores indicating more social support. According to the recommendation of Kelly [30], respondents with average scores lower than 27% in the SSSA score of our overall sample were assigned to the high social support group, whereas those with average scores higher than 73% were assigned to the low social support group. This splitting approach has been verified by numerous scholars such as Gelman and Park [31]. In addition, in the latter statistics, significant differences between the high-social support group and the low-social support group on all counts were found. Cronbach's alpha value for this scale was 0.74.

Self-Perception Profile for Children [32]

The 36-item Self-Perception Profile for Children is a self-report questionnaire to reflect children's self-esteem. The Self-Perception Profile for Children items reflect five dimensions: (1) self-esteem (viz., scholastic competence), (2) social acceptance, (3) athletic competence, (4) physical appearance and behavioral conduct, and (5) global self-worth. Each item is rated on a scale ranging from 1 to 4, with a higher score reflecting a more positive view of oneself. In the current study, Cronbach's alpha value for this scale was 0.79.

Individualism–collectivism scale [33]

The 32-item Individualism–collectivism scale (ICS) was developed to examine individual differences in horizontal individualism, vertical individualism, horizontal collectivism, and vertical collectivism. ICS items reflect four dimensions: (1) horizontal individualism (eight items), (2) vertical individualism (eight items), (3) horizontal collectivism (eight items), and (4) vertical collectivism (eight items) [33]. The measures had reasonable coefficient alpha values [33]. Cronbach's alpha value for this scale was 0.78.

Cognitive Style Questionnaire [34]

The Cognitive Style Questionnaire (CSQ) assesses attributions for 12 negative events in terms of internality, stability, and globality. This composite score (total score divided by the number of items) can range from 1 to 7, with higher scores reflecting greater levels of cognitive vulnerability to depression. Alloy et al. [17] reported that the CSQ composite for negative events has good internal consistency ($\alpha = 0.88$) and retest reliability ($r = 0.80$). In the present study, Cronbach's alpha reliability index reached 0.92, indicating strong internal consistency.

Analysis

SPSS version 23.0 (IBM, Chicago, IL, USA) was used for analysis. The p -values were set as two-tailed with a significance level of $\alpha = 0.05$. First, the adolescents were divided into two subgroups (low social support vs. high

social support) to reflect different MDD subtypes. According to the SSSA score of our overall sample, the subjects were divided into two groups (low social support group vs. high social support group). For each subgroup, the number and percentage of patients were calculated: male and female. Clinical symptoms presented on SSS were analyzed with analysis of variance representing the between factors of subtype (low social support vs. high social support) and gender (female vs. male).

Second, the different genders of adolescents (male and female) were divided into two subgroups (low social support and high social support) to reflect different depression subtypes. Student's t test or analysis of variance was used for continuous variables and the chi-square test for categorical variables. Third, to examine the possible risk factors for lacking social support, a univariate analysis was used between low social support adolescents and high social support adolescents. Factors that were significantly different and clinically significant variables were included in logistic regression.

Results

Sample characteristics

In the total sample ($N = 371$), 46.09% ($n = 171$) of the adolescents met the criteria for SSSA. More female (36.76%, 75 of 204) than male adolescents (19.88%, 33 of 166) had high social support. Chi-square tests indicated significant gender differences in low social support ($p < 0.05$). There were no significant differences between low social support adolescents and high social support adolescents as regards age or education (all $p > 0.05$).

Gender differences in adolescents with low social support and healthy controls

We found gender differences between low social support and high social support groups. In male adolescents, t tests revealed that there were differences in the total collectivism ($t = 2.67$, $p = 0.009$), total score of the Self-Perception Profile for Children scale ($t = -3.64$, $p = 0.001$), stability of cognitive style ($t = -3.57$, $p = 0.001$), and generality of cognitive style ($t = -2.05$, $p = 0.044$) between low social support and high social support groups. In female adolescents, t tests revealed that there were differences in age ($t = 2.31$, $p = 0.023$), horizontal individualism ($t = 4.85$, $p = 0.000$), individualism ratio ($t = -3.24$, $p = 0.002$), horizontal collectivism ($t = 2.07$, $p = 0.041$), total collectivism ($t = 4.18$, $p = 0.000$), scholastic acceptance of the Self-Perception Profile for Children scale ($t = -2.51$, $p = 0.013$), globality of the Cognitive Style Questionnaire ($t = -4.05$, $p = 0.000$), self of the Cognitive Style Questionnaire ($t = -3.45$, $p = 0.001$), consequences of the Cognitive Style Questionnaire ($t = -4.26$, $p = 0.000$), and global self-worth acceptance of the Self-Perception Profile for Children scale ($t = -3.70$, $p = 0.000$) between low social support and high social support groups (Table 1).

Factors related to low social support

Risk factors related to low social support were calculated using binary logistic regression. In male adolescents with low social

TABLE 1

Gender difference comparison between adolescents with high social support and adolescents with low social support

	Male				Female			
	High social support (n = 51)	Low social support (n = 33)	t	p	High social support (n = 59)	Low social support (n = 75)	t	p
Horizontal collectivism	5.72	5.18	2.64	0.010	5.44	4.79	4.85	0.000
total collectivism	5.29	4.86	2.67	0.009	5.22	4.73	4.18	0.000
SPPC global	15.90	17.68	-2.37	0.020	4.73	16.00	-3.70	0.000
SPPC athletic	13.91	16.40	-3.45	0.001	16.46	17.97	-2.57	0.012
SPPC appearance	16.26	17.96	-2.20	0.031	17.58	18.63	-1.73	0.086
SPPC social	15.15	17.94	-4.59	0.000	15.34	18.83	-6.84	0.000
SPPC total score	90.73	100.33	-3.64	0.001	94.58	105.38	-5.40	0.000
Stability	3.22	4.00	-3.57	0.001	3.35	4.07	-4.27	0.000
Generality	3.44	3.84	-2.05	0.044	3.28	4.01	-4.67	0.000
Cohesion-family environment score	11.72	13.08	-3.00	0.004	11.57	13.05	-4.21	0.000
Adolescent life event initial score	121.79	139.33	-3.31	0.001	116.41	134.02	-4.54	0.000
Age	16.53	16.59	-0.24	0.811	16.36	16.02	2.31	0.023
Horizontal individualism	5.27	5.14	0.72	0.475	5.09	4.80	2.07	0.041
Vertical individualism	-0.18	0.00	-1.74	0.087	4.47	4.75	-1.71	0.089
Individualism ratio	15.15	15.77	-0.90	0.369	-0.21	0.02	-3.24	0.002
SPPC academic	16.13	16.61	-0.68	0.498	15.36	16.63	-2.51	0.013
Globality	3.67	3.68	-0.05	0.963	3.21	3.96	-4.05	0.000
Self	3.72	4.14	-1.60	0.113	3.39	4.09	-3.45	0.001
Consequences	3.45	3.66	-0.90	0.374	3.02	3.89	-4.26	0.000
Conflict-family environment score	12.12	13.04	-1.71	0.091	11.65	13.09	-3.62	0.000

Note: Horizontal collectivism = the horizontal collectivism dimension of Individualism-collectivism scale (ICS), total collectivism = the total collectivism dimension of Individualism-collectivism scale (ICS), SPPC global = the global self-worth dimension of Self-Perception Profile for Children scale (SPPC), SPPC athletic = the athletic competence dimension of Self-Perception Profile for Children scale (SPPC), SPPC appearance = the physical appearance dimension of Self-Perception Profile for Children scale (SPPC), SPPC social = the social acceptance dimension of Self-Perception Profile for Children scale (SPPC), SPPC total score = the total score of Self-Perception Profile for Children scale (SPPC), stability = the stability dimension of Cognitive Style Questionnaire (CSQ), generality = the generality dimension of Cognitive Style Questionnaire (CSQ), horizontal individualism = the horizontal individualism dimension of Individualism-collectivism scale (ICS), vertical individualism = the vertical individualism dimension of Individualism-collectivism scale (ICS), individualism ratio = the individualism ratio of Individualism-collectivism scale (ICS), SPPC academic = the competence in scholastic acceptance dimension of Self-Perception Profile for Children scale (SPPC), globality = the globality dimension of Cognitive Style Questionnaire (CSQ), self = the self dimension of Cognitive Style Questionnaire (CSQ), consequences = the consequences dimension of Cognitive Style Questionnaire (CSQ).

support, the following variables were independently associated with the SSSA score: social acceptance of the Self-Perception Profile for Children scale (odds ratio = 0.66, 95% CI = 0.52–0.84, Wald $\chi^2 = 11.23$, $p = 0.001$), physical appearance of the Self-Perception Profile for Children scale (odds ratio = 0.95, 95% CI = 0.80–1.14, Wald $\chi^2 = 0.28$, $p = 0.6$), stability of the Cognitive Style Questionnaire (odds ratio = 0.16, 95% CI = 0.04–0.59, Wald $\chi^2 = 7.50$, $p = 0.006$), and generality of the Cognitive Style Questionnaire (odds ratio = 3.76, 95% CI = 0.96–14.81, Wald $\chi^2 = 3.59$, $p = 0.058$) (Table 2). In female adolescents with low social support, the following variables were independently associated with the SSSA score: total score of the Self-Perception Profile for Children scale (odds ratio = 0.93, 95% CI = 0.87–0.99, Wald $\chi^2 = 5.37$, $p = 0.02$), social acceptance of the Self-Perception Profile for Children scale (odds ratio = 0.69, 95% CI = 0.56–0.86, Wald $\chi^2 = 11.69$,

$p = 0.001$), total individualism (odds ratio = 0.61, 95% CI = 0.26–1.39, Wald $\chi^2 = 1.37$, $p = 0.24$), and total collectivism (odds ratio = 3.87, 95% CI = 1.47–10.15, Wald $\chi^2 = 7.54$, $p = 0.006$) (Table 3).

Discussion

To the best of our knowledge, this study is the first to compare the gender differences in low social support among adolescents with subthreshold depression. In male adolescents, Cognitive Style Questionnaire was an independent contributor to the binary logistic equation with low social support as the dependent variable, whereas in female adolescents, CSQA was not associated with low social support. A significant correlation between social support levels and Self-Perception Profile for Children was found in both male and female adolescents. Multivariate regression analyses indicated that

TABLE 2

Risk factors related to low social support by binary logistic analysis in male adolescents with subthreshold depression

	B	Wald	p	OR	95% CI	
SPPC_social	-0.41	11.23	0.001	0.66	0.52	0.84
SPPC_appearance	-0.05	0.275	0.6	0.95	0.80	1.14
CSQA_stability	-1.83	7.495	0.006	0.16	0.04	0.59
CSQA_generality	1.33	3.591	0.058	3.76	0.96	14.81

Note: SPPC_social = The social acceptance dimension of Self-Perception Profile for Children scale, SPPC_appearance = The social acceptance dimension of Self-Perception Profile for Children scale, CSQA_stability = The stability dimension of Cognitive Style Questionnaire, CSQA_generality = The generality dimension of Cognitive Style Questionnaire.

TABLE 3

Risk factors related to low social support by binary logistic analysis in female adolescents with subthreshold depression

	B	Wald	p	OR	95% CI	
SPPC_total	-0.07	5.37	0.02	0.93	0.87	0.99
SPPC_social	-0.37	11.69	0.001	0.69	0.56	0.86
ICS_ind	-0.49	1.37	0.242	0.61	0.27	1.39
ICS_col	1.35	7.54	0.006	3.87	1.47	10.15

Note: SPPC_total = The total score of Self-Perception Profile for Children scale, SPPC_social = The social acceptance of Self-Perception Profile for Children scale, ICS_ind = Total individualism, ICS_col = Total collectivism.

social support levels were associated with CSQA in male patients, but social support levels were found to be associated with ICS significantly in female adolescents. This suggested that there might be gender differences in the influencing factors of adolescents' social support level. These findings, if able to be replicated, will be of great help in understanding the related factors of subthreshold depression with low social support between different genders. Several findings warrant further investigations.

First, the current results indicate that gender differences have a significant impact on social support levels. This is consistent with most previous studies [35–37]. Most studies believe that there are differences between male and female university students as regards social support [38–40]. Some studies indicate that female individuals receive more support than male individuals and that female individuals are more likely to provide and demand support [41,42]. Gender is an important influence on support-relevant social interactions and can have important effects on the seeking and giving of social support in personal relations [43].

Second, the current results indicate that in male adolescents, the social acceptance dimension of self-perception is significantly associated with the social support level. However, in female subliminal depressed adolescents, in addition to the social acceptance dimension of self-perception, the total score of self-perception was correlated with the level of social support. Studies have indicated that female individuals have a greater tendency to underrate their skills or performance by not taking credit for success and by attributing their success more to external sources than to ability [23]. Moreover, female high school students' self-perception of negative emotions is statistically significantly higher than that of male high school students [44]. There are also significant differences in the cognitive

aspects of self-esteem between female and male individuals. Male individuals report higher levels of self-esteem than female individuals [44]. Male individuals in general tend to be overconfident [45]. The findings may support that the self-perceived judgment of female adolescents is more dependent on the external environment than that of male adolescents and has a greater influence on social support.

Third, our results also indicate that in male adolescents, cognitive styles are significantly associated with the social support level. It has been reported that boys have more negative cognitive styles and that there is a gender difference in cognitive style, with girls having more negative cognitive styles during adolescence [45]. As a result, male adolescents tend to receive more social support than female adolescents. Furthermore, a study that considered the field-dependent cognitive style theory [46] explained that female individuals, more than male individuals, rely on peer input to organize experiences and interpret situations. Female individuals are more field-dependent, and they often have different information processing and personality styles when compared with male individuals [47]. Therefore, differences in male individuals' cognitive styles may also have an impact on their access to social support. In conclusion, perhaps through the gender differences in negative cognition and the different fields of cognitive style dependence between male and female adolescents, there is a close relationship between male adolescents' cognitive style and social support.

Furthermore, in female adolescents, individualism–collectivism and self-evaluation are significantly associated with the social support level. Individualism and collectivism have a great influence on the formation of self-meanings, and the difference in the formation mode will affect the acquisition of social support. Individualistic people gain

self-meanings by including positive traits in their self-definition while excluding the negative ones [48]. In contrast, collectivistic-oriented individuals gain self-meanings by meeting their role standards and forming strong bonds with their social networks [48]. Among female adolescents, collectivism appears to have a more significant effect on social support than individualism. A study argues that female individuals, or feminine forms of collectivism, in comparison with male individuals have a greater tendency to value cooperation, common goals, and the well-being of the group in the context of directness and honesty [26]. In this vein, female individuals place a higher value on sociability and interdependence with other people within an egalitarian structure or on developing their interaction with other people on an equal basis [26]. Overall, collectivism has a greater impact on the social support of female individuals than male individuals.

This study has several limitations. First, this study is a cross-sectional study, and its effectiveness in explaining factors that influence levels of social support is limited. Second, we only obtained samples from high school students, and almost all of these students are Han Chinese. Furthermore, the relatively small sample size precludes the generalizability of the findings. This limits the pan-cultural generalization ability of this study. Third, our research focused on a specific set of factors—negative cognitive style, self-perception, and individualistic and collectivist tendencies—and their relationship with low social support among subthreshold depressed adolescents. Future research should aim to explore the integration of these additional factors to better understand the mechanisms and relationships involved in the complex issue of low social support among subthreshold depressed adolescents. Factors such as family dynamics, school environment, and peer relationships may play a significant role in shaping the experience of low social support. By considering a wider range of influencing factors, future studies can contribute to a more comprehensive understanding of the problem. This will facilitate the development of targeted interventions and support strategies to address low social support among subthreshold depressed adolescents more effectively. In addition, further investigation is required to explore the most effective strategy to enhance the social support for adolescents with subthreshold depression.

In conclusion, the gender difference between low social support among adolescents with subthreshold depression is related to cognitive style, and collectivism–individualism. Our study can provide theoretical support for improving adolescents' social support and alleviating subthreshold depression and spark insight into possible new approaches for the prevention and treatment of subthreshold depression in Chinese adolescents.

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Results were analysed by Jing Xiao, Fangfang Shangguan and Yi Shi. The draft manuscript was written by Yi Shi. Later versions of the manuscript were seen and commented upon by all authors.

Availability of Data and Materials: The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Ethics Approval: None.

Conflicts of Interest: Yi Shi, Jing Xiao and Fangfang Shangguan declare that they have no conflict of interest.

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