Original article

Unequal Gender Norms Are Related to Symptoms of Depression Among Young Adolescents: A Cross-Sectional, Cross-Cultural Study

Leah R. Koenig, M.S.P.H. [a,*], Robert Wm Blum, M.D., M.P.H., Ph.D. [a], Denese Shervington, M.D., M.P.H. [b], Jakevia Green, M.P.H. [b], Mengmeng Li, M.S.P.H., M.B.B.S. [a], Hanani Tabana, M.P.H., Ph.D. [c], and Caroline Moreau, M.D., M.P.H., Ph.D. [a,d]

[a] Department of Population, Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland
[b] Institute of Women and Ethnic Studies, New Orleans, Louisiana
[c] School of Public Health, University of the Western Cape, Cape Town, South Africa
[d] Gender, Sexual and Reproductive Health, CESP Centre for Research in Epidemiology and Population Health U1018, Inserm, Villejuif, France

A B S T R A C T

Purpose: This study was undertaken among 10- to 14-year-old girls and boys in disadvantaged areas of Shanghai, China; Cuenca, Ecuador; Flanders, Belgium; and Denpasar and Semarang, Indonesia. It aimed to assess whether gender norms are related to depressive symptomatology, and to examine whether sex differences in depressive symptoms can be explained by differences in gender norm perceptions.

Methods: We examined the distributions of depressive symptoms and two gender norms scales, gender stereotypical traits (GST), and sexual double standard (SDS), across sites and by sex. We next assessed crude and adjusted associations between each of the gender norms scales and depressive symptoms. Finally, we conducted path analysis to examine the mediating role of gender perceptions in sex differences in depressive symptoms.

Results: Girls reported more depressive symptoms than boys in all sites except Denpasar. SDS perceptions were more unequal among girls in most sites, while GST perceptions were more unequal among boys in all sites except Semarang. Gender-equal SDS and GST perceptions were associated with fewer depressive symptoms, while unequal perceptions were related to more symptoms. Gendered perceptions about traits and relationships appeared to partially mediate relationships between sex and depressive symptoms in Shanghai, Cuenca, and Semarang.

Conclusions: Unequal gender norm perceptions were linked to poor mental health among boys and girls, suggesting that gender norms may play a role in psychological wellbeing for adolescents of both sexes. Gender norm perceptions appear to play a role in mental health sex disparities we observed across sites.

IMPLICATIONS AND CONTRIBUTION

Unequal gender perceptions are related to more symptoms of depression among disadvantaged young adolescents in five urban settings. Girls report more depressive symptoms than boys; and gender norms mediate those sex differences in some sites. Programs that address unequal gender norms may play a role in improving the mental health of adolescents.

Over the past decade, concern about young people's mental health has increased globally [1,2]. Today, depression is the leading cause of years lost to disability for adolescents ages 10–19 [3]. Early adolescence marks the beginning of an increase in the incidence of depression [4]. The World Health Organization estimates that over half of all mental health conditions emerge by age 14 [3]. Depression carries with it lifelong ramifications for educational and economic trajectories [5,6].

While social and economic disadvantage has been widely linked to depression [7,8], uncertainty remains about the pathways by which gendered experiences influence mental health. Focusing on young people, Kapungu and Petroni [9] have posited that unequal gender norms interfere with both adolescent girls' and boys' sense of the control over their lives and futures. The authors also highlighted the dearth of evidence about the relationships between gendered experiences and adolescent mental health, a gap that is particularly pronounced for early adolescence (10–14 years old).

Studies that have assessed the associations between aspects of gendered experiences and poor mental health among adolescents in low- and middle-income countries tend to focus on girls. Beattie et al. [10] highlighted the gendered correlates of distress among 13- to 14-year-old girls in Karnataka, India, including experiences of violence, early childbearing and marriage, and limited autonomy. Satyanarayana et al. [11] linked multiple forms of gender disadvantage (including discrimination and gendered barriers to personal growth) to distress among older adolescent girls living in urban slum areas of Bangalore, India. A relationship between gender-unequal peer norms and poor self-esteem has been documented among adolescent refugee girls in Ethiopia [12]. However, the exclusion of boys from such studies assumes that unequal gender dynamics constrain girls' choices and promote their social isolation without testing whether such norms benefit or harm the mental health of boys.

Adolescence is also the period during which a sex divide in depression is first observed; and by age 16, depression is nearly twice as common among girls than boys [13,14]. This disparity persists throughout the life course [15]. While developmental, biological, and contextual factors have been proposed to help explain this sex difference, researchers are still exploring the extent to which this disparity is shaped by social factors such as gendered expectations. Several gendered determinants of this gap have been hypothesized, including women and girls' marginalization, disproportionate exposures to adversity and violence, and distress associated with caretaking and household responsibilities [16,17].

Given rising concern about adolescent mental health and efforts to bolster gender equality, this study contributes to a growing body of literature that explores how adolescents' perceptions of gender norms relate to depressive symptoms in adolescence among both boys and girls [18–20]. We focus specifically on the critical early adolescent period, at the time of both intensifying gender expectations and the emerging sex divide in depression. The present study aims to explore: (1) the relationships between perceptions of unequal gender norms and the presence of depressive symptoms among adolescents ages 10–14 living in low-income communities in five cities in four countries across the world, (2) compare these associations among adolescent boys and girls,

and (3) assess whether perceptions of gender unequal norms mediate relationships between sex and depressive symptomatology that reflect a disproportionate mental health burden among girls.

Methods

Sampling

This analysis included data from five sites of the Global Early Adolescent Study (GEAS): Shanghai, China; Cuenca, Ecuador; Flanders, Belgium; and Denpasar and Semarang, Indonesia. The sites all represent urban poor areas within their respective contexts but vary substantially in their demographic, economic, social, and cultural characteristics, including prevailing gender norms. While all GEAS sites used the same study instruments, the sampling and data collection procedures varied. In Shanghai, Flanders, Semarang, and Denpasar, schools were purposively selected based on the socioeconomic status of the student body. In Cuenca, seven schools were randomly selected after stratification by neighborhood and school type. Within those schools, all eligible students in Shanghai and Flanders, all eligible seventh grade students in Semarang and Denpasar, and a randomly selected group of students (stratified by age and sex) in Cuenca, were invited to enroll [21].

Initial sample sizes were 1,760 in Shanghai, 704 in Cuenca, 1,013 in Flanders, 1,517 in Semarang, and 1,753 in Denpasar. Cases missing 15% or more of overall survey data were excluded (46 in Shanghai, 90 in Cuenca, 223 in Flanders, 23 in Semarang, and 48 in Denpasar), as were those missing items used to construct the depressive symptom index outcome (10 in Shanghai, 9 in Cuenca, 43 in Flanders, 17 in Semarang, and 39 in Denpasar), or items used to construct the key predictors in the form of two gender norms scales (67 in Shanghai, 50 in Cuenca, 123 in Flanders, 81 in Semarang, and 129 in Denpasar). Our final analytical samples consisted of 1,637 in Shanghai, 555 in Cuenca, 624 in Flanders, 1,396 in Semarang, and 1,537 in Denpasar. We used the K-Nearest Neighbor method to impute any missing data on covariates, based on age and sex (K-values of 36 for Shanghai, 22 for Cuenca, 23 for Flanders, 34 for Semarang, and 36 for Denpasar).

Data collection

In each of the sites, GEAS surveys were administered using computer-assisted self-interview on tablets. The survey was developed during an extensive formative phase of the GEAS study that involved 14 sites across 5 continents, including Flanders, Cuenca, and Shanghai. The surveys were translated into local languages, revised based on face validity testing, and subsequently pilot tested in all sites. The survey collected information on young people's sociodemographic background, family and peer environments, perceptions of gender norms and levels of agency, and their health, including mental and sexual health. All study protocols were approved by each site's ethical review committee and deemed exempt for secondary data collection by the Johns Hopkins School of Public Health's Institutional Review Board. The study in Shanghai was also approved by the World Health Organization Ethical Review Committee.

Measures

Our main outcome of interest was a depressive symptom index, developed within the GEAS from six items. Each item was scored on a five-point Likert scale ranging from "Disagree a lot" to "Agree a lot." A summed depressive symptom index was constructed ranging from 0 ("Disagree a lot" to all six items) to 24 ("Agree a lot" to all six items). The items are described in more detail in Appendix Table 1 and have been previously reported in Blum et al. [22].

Our key predictors were two scales that reflected perceptions of gender norms related to romantic relationships and traits. The first was a sexual double standard (SDS) scale, comprised of six items that measure the extent to which adolescents perceived that girls are penalized and boys rewarded for romantic and sexual activity [23]. The second was a gender stereotypical traits (GST) scale that included seven items measuring adolescents' perceptions of characteristics opposing male strength and female vulnerability [24]. More details about these items are presented in Appendix Table 1. Each scale was scored from 1 to 5, with greater values indicating more gender-unequal perceptions. Each of the two gender norms scales were subsequently used to create a categorical measure within each site with three levels: the reference category (within one standard deviation of the mean), gender-equal (more than one standard deviation below the mean), and gender-unequal (more than one standard deviation above the mean). These categorical measures were employed in models that examined the relationships between gender norms and depressive symptoms, in an effort to examine the associated mental health consequences of outlying progressive or traditional norm perceptions.

Covariates included age (continuous) and several binary measures. Pubertal onset (prepubertal or pubertal) was captured by sex-specific indicators of pubertal maturation reflecting breast growth and menarche for girls, and voice, genital, and facial hair development for boys. Educational attainment (behind in school, or at or above expected school year for age), number of close friends (none or any close friends), and caregiver closeness (not close or no caregiver reported, or close to caregiver) were assessed. In addition, a binary indicator that described adolescents' adverse childhood experiences (ACEs) (reporting none or any exposures) was included as a covariate in all sites except for Flanders, where the items were not asked [22].

Analysis

We first examined the sociodemographic characteristics of each sample by sex. We then described mean scores of the depressive symptom index and the two gender norm scales in each site overall and by sex to assess any significant differences between boys and girls using Student's *t*-tests. Next, we conducted simple and multivariable linear regressions in the overall samples, and after stratification by sex, to evaluate the effect of each of the gender norms scales (SDS and GST) on depressive symptoms in separate models. Both gender norm measures were treated as categorical in these analyses to examine the risk of depressive symptoms associated with more gender-equal and more gender-unequal perceptions relative to the reference category. Subsequently, test of interactions between sex and gender norm perceptions were conducted to identify any differential effects for boys and girls.

In the third stage of analysis, we assessed the mediating role of each gender norm construct in the relationship between sex and depressive symptoms using structural equation modeling. We conducted these analyses in sites where we observed significant sex differences in depressive symptoms using Stata's *sem* command, which fits two regression models. The first regressed our mediator (gender norms) on the independent variable (sex) adjusting for covariates. Then our outcome (depressive symptoms) was regressed on the independent and mediator variables, with adjustment for covariates. This procedure estimated the total effect, indirect effect, and direct effect of sex on depressive symptoms, as well as direct pathways between sex and gender norms measures, and gender norm measures and depressive symptoms. We then calculated the ratio of the indirect effect to total effect, to estimate the percentage of the total effect mediated in each site. For structural equation models, we employed the gender norms scales as continuous measures (ranging from 1 to 5) to avoid the introduction of bias due to categorization of the mediator. All analyses were stratified by site to account for variation in study contexts and sampling procedures.

Results

Descriptive results

Descriptions of each site's sample are presented in Table 1. Boys were older than girls in all sites except Cuenca. In the two sites in Indonesia, boys were more likely than girls to be behind in school for their age. More girls than boys had begun puberty in all sites except Flanders. ACEs were more common among girls than boys in Cuenca.

Mean depressive symptom scores (on a scale from 0 to 24) are shown in Figure 1. Depressive symptom mean scores were highest in Denpasar (mean: 11.4) and lowest in Flanders (mean: 7.6). Mean depressive symptom scores were significantly higher among girls than boys in all sites, with the exception of Denpasar, where we observed no significant sex difference.

Mean scores of the SDS and GST scales ranged from 1 to 5, and are presented in Figure 2. Perceptions of SDS were most unequal in Cuenca (mean score = 3.6) and most equal in Shanghai and Semarang (mean score = 2.6). In each site but Denpasar, perceptions of SDS were stronger among girls than boys. Perceptions of GST were more unequal in general than those of SDS. GST perceptions were most unequal among adolescents in Denpasar (mean score = 3.9) and most equal in Flanders (mean score = 3.0). Boys' perceptions of gendered traits were more unequal than girls across the sites except in Semarang.

Associations between gender norms and depressive symptoms

The results of adjusted linear regression models that examined relationships between gender norm perceptions and depressive symptoms are presented in Figure 3 (tables of regression results are presented in Appendix Table 2).

In overall adjusted models, gender-equal SDS perceptions were associated with fewer depressive symptoms, compared to the reference group in all five sites. Meanwhile, adolescents with gender-unequal SDS perceptions had more depressive symptoms compared to the reference group. This finding was significant in all sites but Cuenca. In sex-stratified models, gender-equal perceptions of SDS were significantly related to fewer depressive

Table 1
Sample description, by site

	Shanghai				Cuenca				Flanders				Semarang				Denpasar			
	Overall	Boys	Girls	p value	Overall	Boys	Girls	p value	Overall	Boys	Girls	p value	Overall	Boys	Girls	p value	Overall	Boys	Girls	p value
Number of friends	1,637	827	810		555	281	274		624	344	280		1,396	635	761		1,537	740	797	
Age, mean (SD)	12.5 (1.0)	12.5 (1.0)	12.4 (.9)	*	12.0 (1.4)	12.1 (1.3)	12.0 (1.4)		13.1 (.8)	13.2 (.7)	13.0 (.8)	†	12.2 (.5)	12.3 (.6)	12.2 (.5)	‡	12.1 (.5)	12.2 (.5)	12.1 (.5)	*
Education status																				
Lower than age expected grade	3.8%	4.5%	3.2%		9.7%	10.3%	9.1%		5.4%	4.9%	6.1%		1.1%	1.9%	.5%	*	1.2%	1.9%	.6%	*
Age expected grade or higher	96.2%	95.5%	96.8%		90.3%	89.7%	90.9%		94.6%	95.1%	93.9%		98.9%	98.1%	99.5%		98.8%	98.1%	99.4%	
Pubertal onset																				
Prepubertal	8.2%	10.3%	6.0%	†	11.7%	14.6%	8.8%	*	2.6%	1.7%	3.6%		5.1%	8.5%	2.2%	‡	7.7%	9.5%	6.1%	*
Pubertal	91.8%	89.7%	94.0%		88.3%	85.4%	91.2%		97.4%	98.3%	96.4%		94.9%	91.5%	97.8%		92.3%	90.5%	93.9%	
Closeness to caregiver																				
No caregiver or not close	13.6%	14.8%	12.3%		6.8%	5.3%	8.4%		32.9%	30.2%	36.1%		14.5%	13.4%	15.4%		9.0%	10.3%	7.9%	
Yes	86.4%	85.2%	87.7%		93.2%	94.7%	91.6%		67.1%	69.8%	63.9%		85.5%	86.6%	84.6%		91.0%	89.7%	92.1%	
Number of friends																				
No close friends	37.1%	36.0%	38.3%		31.4%	29.9%	33.0%		24.2%	21.8%	27.1%		32.0%	32.9%	31.3%		28.8%	29.2%	28.4%	
Any close friends	62.9%	64.0%	61.7%		68.6%	70.1%	67.0%		75.8%	78.2%	72.9%		68.0%	67.1%	68.7%		71.2%	70.8%	71.6%	
ACEs																				
No history of ACEs	25.9%	25.3%	26.5%		18.0%	21.4%	14.6%	*					20.0%	18.7%	21.0%		21.4%	20.8%	22.0%	
Any history of ACEs	74.1%	74.7%	73.5%		82.0%	78.6%	85.4%						80.0%	81.3%	79.0%		78.6%	79.2%	78.0%	

ACE = adverse childhood experience; SD = standard deviation.

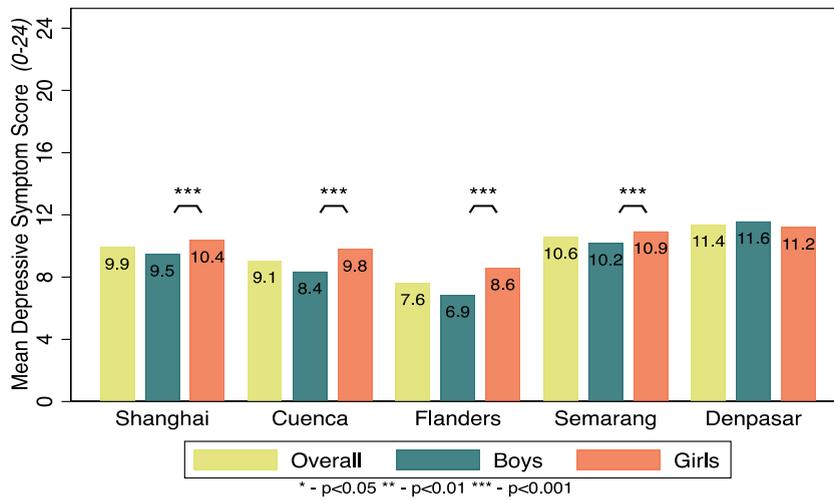* $p < .05$.
† $p < .01$.
‡ $p < .001$.

Figure 1. Mean depressive symptom scores by site and sex.

symptoms among girls in Shanghai, Semarang, and Denpasar, and among boys in Flanders and Semarang. Meanwhile, gender-unequal perceptions were associated with more depressive symptoms only among boys in Shanghai and Flanders, and among both boys and girls in the two Indonesian sites.

Testing for differences in the relationships between SDS perceptions and depressive symptoms by sex in the overall model, findings diverged for girls and boys in Denpasar ($p = .026$). There, the relationship between gender-equal SDS perceptions and fewer depressive symptoms was stronger among girls than boys ($p = .007$).

After adjustment, unequal GST perceptions were associated with more symptoms of depression in all sites with the exception of Flanders. Meanwhile, gender-equal perceptions were only significantly linked to fewer depressive symptoms in Shanghai. In sex-stratified models, equal GST perceptions were linked to fewer depressive symptoms among girls in Shanghai, boys in Cuenca, and girls in Semarang. Gender-unequal GST perceptions were associated with more depressive symptoms among both boys and girls in all sites but Flanders.

Tests of interaction terms between sex and GST perceptions were not statistically significant.

Tests of mediation effects

We next explored the role of gender norm perceptions in the observed sex differences in depressive symptoms using a mediation model that was adjusted for covariates (Figure 4). As we observed no significant differences in depressive symptoms in Denpasar by sex, mediation analyses were conducted in Shanghai, Cuenca, Flanders, and Semarang.

The results of the mediation models for SDS are presented in Figure 4A. When we examined each direct path, we observed positive and significant effects of (1) sex on depressive symptoms, (2) sex on SDS, and (3) SDS on depressive symptoms. Together, these direct effects indicate that girls exhibited more depressive symptoms and endorsed more unequal SDS perceptions than boys, and that unequal SDS perceptions were associated with more depressive symptoms. The indirect path through SDS accounted for 13.48% (in Semarang) to 37.23% (in Shanghai)
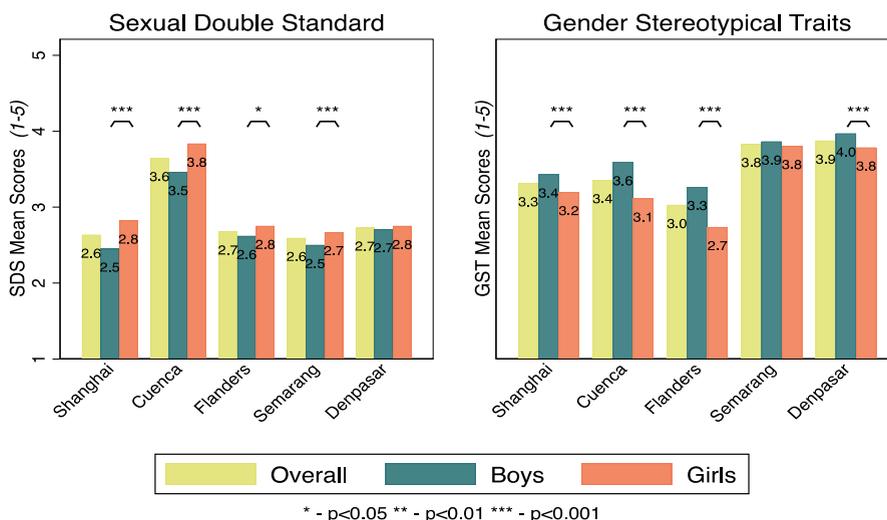

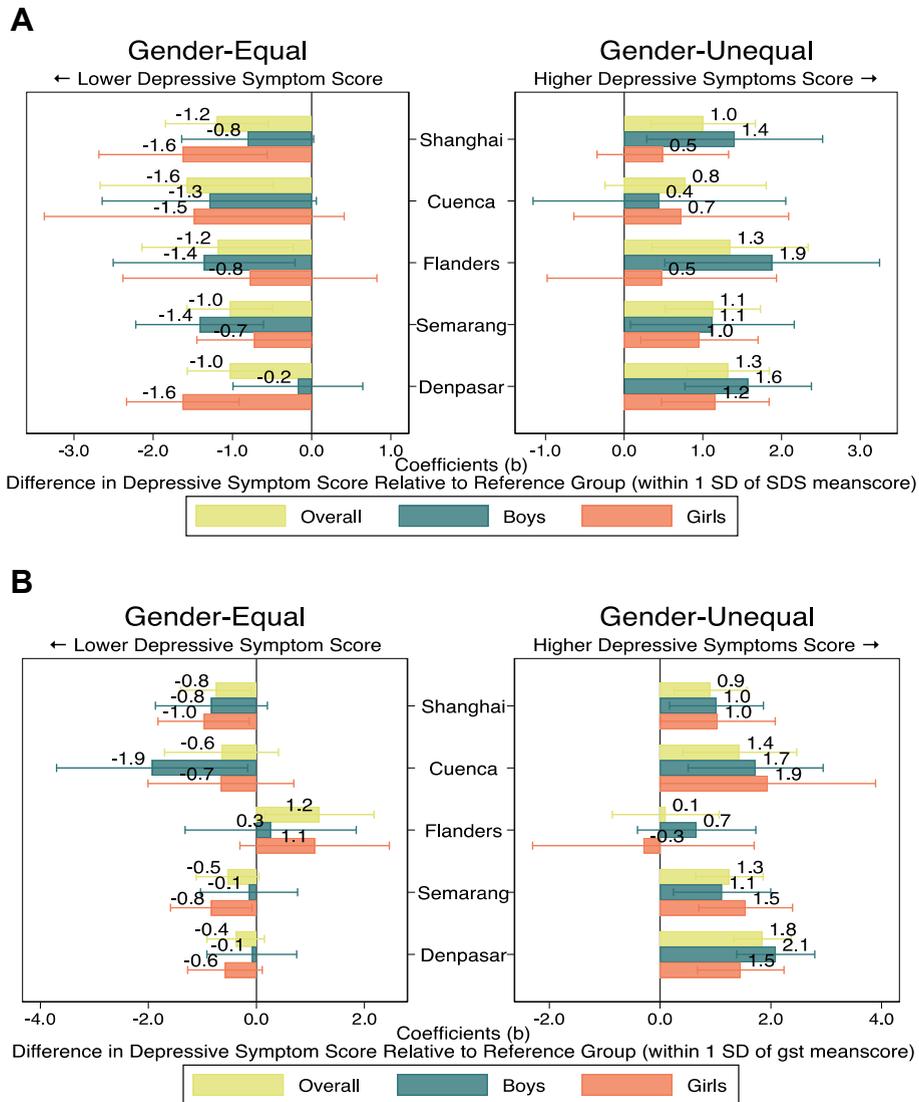**Figure 2.** Gender norms scale mean scores by site and sex.

Figure 3. (A) Adjusted association between sexual double standard perceptions and depressive symptoms. (B) Adjusted association between gender stereotypical perceptions and depressive symptoms.

of the total effect of sex on depressive symptoms. No significant mediation effect was observed in Flanders.

The results of the models that examined the mediating effect of GST perceptions on sex differences in depressive symptoms are presented in Figure 4B. In these models, while the direct effects of both sex and GST on depressive symptoms were positive (indicating that girls compared to boys and more unequal GST were each linked to depressive symptoms), the direct effect of sex on GST was negative in most sites (reflecting more unequal GST endorsement among boys than girls). The differing directions of effects in the indirect pathway produced inconsistent mediation, which in turn generated negative proportions of total effect that is indirect in most sites. The mediating effect was significant in Shanghai and Cuenca, where 21.28% and −44.35% of the total effect operated through the indirect pathway, respectively. In Flanders and Semarang, no significant mediation effects were detected.

Discussion

The present analysis explored the relationships between depressive symptoms and perceptions of gender norms characterizing traits and relationships among young adolescent boys and girls in disadvantaged communities within five urban centers in China, Ecuador, Belgium, and Indonesia. We found that adolescents with unequal gender perceptions about both romantic relationships and traits were at risk for greater depressive symptomology. Conversely, gender-equal perceptions about relationships were associated with fewer reported symptoms of depression, and this relationship was especially pronounced for girls in Denpasar. This study also provides novel evidence that sex divides in depression are partially mediated by gender norm perceptions in at least some settings.

Depressive symptoms were common across settings, with girls reporting greater depression than boys in all sites but
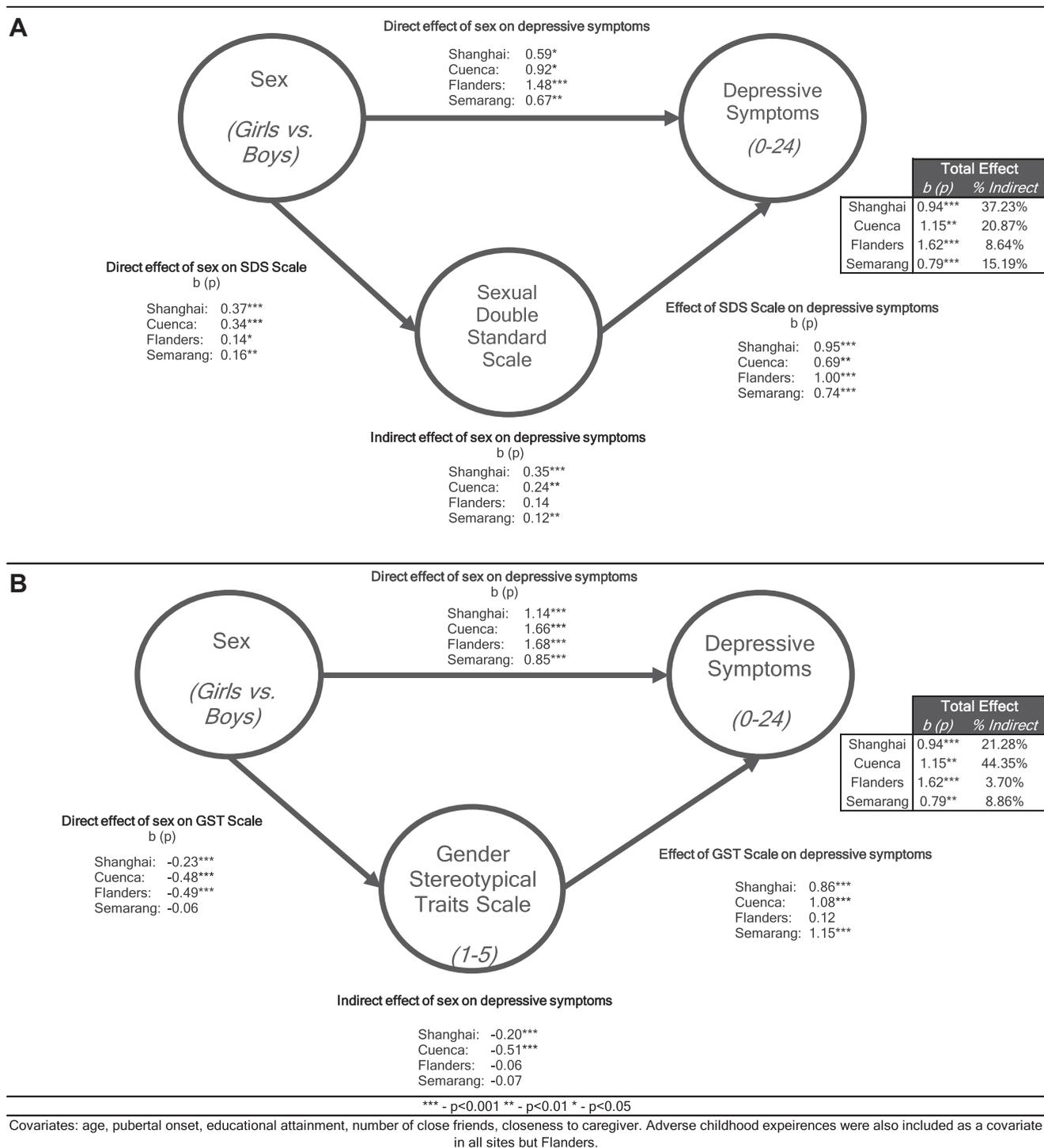
A

Direct effect of sex on depressive symptoms

Sex (Girls vs. Boys)

Shanghai:	0.59*
Cuenca:	0.92*
Flanders:	1.48***
Semarang:	0.67**

Depressive Symptoms (0-24)

Direct effect of sex on SDS Scale
b (p)

Shanghai:	0.37***
Cuenca:	0.34***
Flanders:	0.14*
Semarang:	0.16**

Sexual Double Standard Scale

Effect of SDS Scale on depressive symptoms
b (p)

Shanghai:	0.95***
Cuenca:	0.69**
Flanders:	1.00***
Semarang:	0.74***

	Total Effect	
	b (p)	*% Indirect*
Shanghai	0.94***	37.23%
Cuenca	1.15**	20.87%
Flanders	1.62***	8.64%
Semarang	0.79***	15.19%

Indirect effect of sex on depressive symptoms
b (p)

Shanghai:	0.35***
Cuenca:	0.24**
Flanders:	0.14
Semarang:	0.12**

B

Direct effect of sex on depressive symptoms
b (p)

Sex (Girls vs. Boys)

Shanghai:	1.14***
Cuenca:	1.66***
Flanders:	1.68***
Semarang:	0.85***

Depressive Symptoms (0-24)

Direct effect of sex on GST Scale
b (p)

Shanghai:	-0.23***
Cuenca:	-0.48***
Flanders:	-0.49***
Semarang:	-0.06

Gender Stereotypical Traits Scale (1-5)

Effect of GST Scale on depressive symptoms

Shanghai:	0.86***
Cuenca:	1.08***
Flanders:	0.12
Semarang:	1.15***

	Total Effect	
	b (p)	*% Indirect*
Shanghai	0.94***	21.28%
Cuenca	1.15**	44.35%
Flanders	1.62***	3.70%
Semarang	0.79**	8.86%

Indirect effect of sex on depressive symptoms

Shanghai:	-0.20***
Cuenca:	-0.51***
Flanders:	-0.06
Semarang:	-0.07

*** - p<0.001 ** - p<0.01 * - p<0.05

Covariates: age, pubertal onset, educational attainment, number of close friends, closeness to caregiver. Adverse childhood expeirences were also included as a covariate in all sites but Flanders.

Figure 4. Path analysis examining mediating effects of gender norms on the relationship between sex and depressive symptoms.

Denpasar. These sex differences in depressive symptomatology echo prior findings on depression in this age group [14,25]. Our results demonstrate that after controlling for other factors, such as pubertal onset and experiences of childhood adversity, by the early adolescent years (ages 10–14), a clear sex disparity has already emerged across most of these settings.

In our analysis, depressive symptomatology was generally related to gender norm perceptions across sites, increasing as young adolescents' gender perceptions became more unequal. Our study contributes to a small body of literature that has examined the associations between gender norm perceptions and mental health in the early adolescent period. Saeed Ali et al.

[20] demonstrated associations between unequal gender attitudes and depression among young adolescent boys in Pakistan, but not among girls. Baird et al. [19] also demonstrated links between unequal individual- and community-level gender perceptions and poor mental health among young adolescents in low- and middle-income countries settings. Their findings suggest that this association extends beyond personal attitudes, as community-level gender norms also affected adolescents' mental health. Together, this evidence suggests that unequal gender norms may be detrimental to the mental health of young people.

Our results echo those of Baird, suggesting that gender unequal norms may impact mental health among young adolescents of both sexes. We also found that in most sites, gender norm perceptions were related to both boys' and girls' risk of depressive symptoms. These results suggest that restrictive gender norms may constrain young people's freedom of expression and perceptions of their futures, and that interventions effective in reducing gender unequal norms may have a positive impact on the mental health of adolescents of both sexes. Patterns diverged in Denpasar, Indonesia, where we noted no sex differences in depressive symptoms. Prior research with this cohort in Denpasar has shown that girls have greater voice and decision-making agency than boys, perhaps reflecting a departure from gendered divisions of power that are common across many settings, and which may explain the absence of a gender divide in mental health outcomes in this population [26]. In Denpasar, we also documented a more beneficial effect of gender equal SDS perceptions among girls than boys. In that setting, girls may stand to benefit more from gender-equal perceptions about relationships as such norms function to marginalize women disproportionately. Questions remain as to whether restrictive gender norms lower young people's perceived control over their lives, how biological factors interact with social vulnerability, and how living in communities with more unequal gender perceptions put young people at increased risks of comorbidities of depression, such as violence.

The sex divide in depression has previously been attributed to both biological and social factors that influence symptomatology, health-seeking behaviors, and symptom management [27,28]. In our study, we found that SDS perceptions partially mediated the observed sex differences in depressive symptoms in Shanghai, Cuenca, and Semarang. These results suggest that SDS may play a role in the relative mental health disadvantage we see among girls in those sites. While we observed the largest gap between girls' and boys' reported mental health in Flanders, SDS perceptions did not appear to be driving this divide. This could be attributed to the smaller sex differential in SDS perceptions observed in Flanders than in other sites. Meanwhile for GST, our findings demonstrate that more unequal trait perceptions among boys compared to girls may be suppressing the mental health sex differences we observe in total effects. The different mediation patterns observed for SDS and GST also highlight the heterogeneity of gender perceptions and their relationships to mental health. Together, these results suggest that the disproportionate burden of depression among girls compared to boys that emerges in early adolescence may be shaped in part by the social norms that govern gender scripts for young people.

While the role of gender norms as a mediator in sex differences in depression among young people has not been widely studied, existing research has linked gender inequality and greater differences by sex in depression. For example, Yu's [29]

study of adult populations in 122 countries found that countries with greater gender inequality had greater sex disparities in depression prevalence. Seedat et al.'s [30] cross-national analysis of adult populations found relationships between more equal views about women's roles and narrowed sex differences in major depression within countries across time. In the U.S., O'Loughlin et al. [31] demonstrated that men" greater endorsement of toughness mediated an observed sex difference, with women more likely to seek help for depression. Our findings contribute novel evidence about the interactions of biological and social factors in depression risk during early adolescence, a critical juncture that remains understudied to date. Future research on this topic should explore the mechanisms by which gender norms operate to shape gendered mental health disparities among young people.

This analysis also has several important limitations. First, while our measure of depressive symptoms has been used in prior studies, it has thus far only been validated in limited samples, and cannot be interpreted as diagnostic. The lack of a widely validated measure of depression in this analysis also means we cannot make any comparisons about the prevalence of depression among our sample. Second, our gender norms measures represent adolescents' perceptions of gender norms, rather than their individual attitudes, and therefore may differ from other research that aims to explore the link between gender attitudes and mental health. This difference, though nuanced, may shape the findings we have observed in settings where adolescents' attitudes and perceptions of norms may differ. Third, these data are cross-sectional, and therefore causality in the detected associations cannot be inferred. Longitudinal data, which is collected as part of the GEAS, will help to elucidate causal links between gender norms and depression. Fourth, the samples employed in this analysis are not representative, and therefore findings cannot be generalized to young people from different social backgrounds including out of school adolescents, affluent urban populations, or those living in rural settings. Further research should explore these questions using larger representative samples, to examine how perceptions of gender norms contribute to adolescent depressive symptoms according to their social contexts. Relatedly, while the study samples cover geographical representation of three continents, there are wide regional shortcomings of the sites represented in this study. A replication of this analysis in other GEAS sites in sub-Saharan Africa and South America will provide more insights on the ways gender norms inform sex differences in mental health in adolescents according to context. Finally, while we have accounted for additional factors that may shape young adolescents' risk of depression (including protective factors such as friendship and caregiver relationships, and risks such as ACE exposures), we are unable to capture a full picture of the biological and social factors that shape depression, of which gender is only a singular aspect.

Despite its limitations, among the strengths of this study are its exploration of the relationships between perceptions of two dimensions of gender norms and symptoms of depression among young people living in five geographically and culturally diverse urban contexts, contributing novel cross-cultural data to this question. Employing five distinct samples from three continents, we generally found patterns in the same directions across sites. Future research that explores the mechanisms by which gender unequal norm perceptions relate to adverse mental health will help to elucidate the social factors that shape

the emergence of depression in this period, and further inform policies to promote young people's psychosocial wellbeing.

Conclusion

This study demonstrates that unequal gender norm perceptions are related to more symptoms of depression among young adolescents ages 10–14 across diverse geographies and settings. Results of mediation analyses demonstrated that each gender norm domain (SDS and GST) partially mediated the sex disparities in depressive symptoms we observed in some sites. These findings contribute evidence that suggests a mental health penalty of unequal gender perceptions among both young adolescent boys and girls, as well as the ways gendered perceptions may shape the disproportionate burdens of depression girls face beginning in this period. This study broadens the evidence base that suggests that the mental health of all young people stands to benefit from gender-equal perceptions and norms. Future research, with longitudinal designs more expansive measures of gendered perceptions, can elucidate the relationship between gender expectations and mental health among young people.

Supplementary Data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jadohealth.2021.01.023.

Funding Sources

References

[1] Kieling C, Baker-Henningham H, Belfer M, et al. Child and adolescent mental health worldwide: Evidence for action. Lancet 2011;378:1515–25.
[2] Lu C, Li Z, Patel V. Global child and adolescent mental health: The orphan of development assistance for health. PLOS Med 2018;15:e1002524.
[3] World Health Organization. Health for the world's adolescents: A second chance in the second decade: Summary. Available at: https://apps.who.int/iris/handle/10665/112750. Published online 2014. Accessed February 23, 2020.
[4] Kessler R, Angermeyer M, Anthony J, et al. Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's world mental health survey initiative. World Psychiatry 2007;6:168–76.
[5] Chisholm D, Sweeny K, Sheehan P, et al. Scaling-up treatment of depression and anxiety: A global return on investment analysis. Lancet Psychiatry 2016;3:415–24.
[6] Fletcher J. Adolescent depression: Diagnosis, treatment, and educational attainment. Health Econ 2008;17:1215–35.
[7] Patel V, Simon G, Chowdhary N, et al. Packages of care for depression in low- and middle-income countries. PLoS Med 2009;6:e1000159.
[8] Allen J, Marmot M, World Health Organization, Fundação Calouste Gulbenkian. Social determinants of mental health. 2014. Available at: http://apps.who.int/iris/bitstream/10665/112828/1/9789241506809_eng.pdf?ua=1. Accessed August 16, 2020.
[9] Kapungu C, Petroni S. Understanding and tackling the gendered drivers of poor adolescent mental heatlh. Washington, DC: International Center for Research on Women; 2017:24.
[10] Beattie TS, Prakash R, Mazzuca A, et al. Prevalence and correlates of psychological distress among 13–14 year old adolescent girls in North Karnataka, South India: A cross-sectional study. BMC Public Health 2019;19:48.
[11] Satyanarayana VA, Chandra PS, Sharma MK, et al. Three sides of a triangle: Gender disadvantage, resilience and psychological distress in a sample of adolescent girls from India. Int J Cult Ment Health 2016;9:364–72.
[12] Stark L, Asghar K, Seff I, et al. How gender- and violence-related norms affect self-esteem among adolescent refugee girls living in Ethiopia. Glob Ment Health 2018;5:e2.
[13] Breslau J, Gilman SE, Stein BD, et al. Sex differences in recent first-onset depression in an epidemiological sample of adolescents. Transl Psychiatry 2017;7:e1139.
[14] McGuinness TM, Dyer JG, Wade EH. Gender differences in adolescent depression. J Psychosoc Nurs Ment Health Serv 2012;50:17–20.
[15] Salk RH, Hyde JS, Abramson LY. Gender differences in depression in representative national samples: Meta-analyses of diagnoses and symptoms. Psychol Bull 2017;143:783–822.
[16] Lund C, Brooke-Sumner C, Baingana F, et al. Social determinants of mental disorders and the sustainable development goals: A systematic review of reviews. Lancet Psychiatry 2018;5:357–69.
[17] Kuehner C. Why is depression more common among women than among men? Lancet Psychiatry 2017;4:146–58.
[18] United Nations. Sustainable development goal 5: Achieve gender equality and empower all women and girls. Sustainable development knowledge platform. Available at: https://sustainabledevelopment.un.org/sdg5. Accessed February 20, 2020.
[19] Baird S, Bhutta ZA, Hamad BA, et al. Do restrictive gender attitudes and norms influence physical and mental health during very young adolescence? Evidence from Bangladesh and Ethiopia. SSM - Popul Health 2019;9. 100480.
[20] Saeed Ali T, Karmaliani R, Mcfarlane J, et al. Attitude towards gender roles and violence against women and girls (VAWG): Baseline findings from an RCT of 1752 youths in Pakistan. Glob Health Action 2017;10. 1342454.
[21] Mmari K, Cooper D, Moreau C, et al. The social context of early adolescents in the Global Early Adolescent Study. J Adolesc Health 2021;69(S):S5–15.
[22] Blum RW, Li M, Naranjo-Rivera G. Measuring adverse child experiences among young adolescents globally: Relationships with depressive symptoms and violence perpetration. J Adolesc Health 2019;65:86–93.
[23] Moreau C, Li M, De Meyer S, et al. Measuring gender norms about relationships in early adolescence: Results from the Global Early Adolescent Study. SSM - Popul Health 2019;7. 100314.
[24] Moreau C, Li M, Ahmed S, et al. Assessing the spectrum of gender norms perceptions in early adolescence: A cross-cultural analysis of the Global Early Adolescent Study. J Adolesc Health 2021;69(S):S16–22.
[25] Hyde JS, Mezulis AH, Abramson LY. The ABCs of depression: Integrating affective, biological, and cognitive models to explain the emergence of the gender difference in depression. Psychol Rev 2008;115:291–313.
[26] Zimmerman LA, Li M, Moreau C, et al. Measuring agency as a dimension of empowerment among young adolescents globally; findings from the Global Early Adolescent Study. SSM Popul Health 2019;8:100454.
[27] Ando S, Nishida A, Usami S, et al. Help-seeking intention for depression in early adolescents: Associated factors and sex differences. J Affect Disord 2018;238:359–65.
[28] Seidler ZE, Dawes AJ, Rice SM, et al. The role of masculinity in men's help-seeking for depression: A systematic review. Clin Psychol Rev 2016;49:106–18.
[29] Yu S. Uncovering the hidden impacts of inequality on mental health: A global study. Transl Psychiatry 2018;8:98.
[30] Seedat S, Scott KM, Angermeyer MC, et al. Cross-national associations between gender and mental disorders in the World Health Organization world mental health surveys. Arch Gen Psychiatry 2009;66:785.
[31] O'Loughlin RE, Duberstein PR, Veazie PJ, et al. Role of the gender-linked norm of toughness in the decision to engage in treatment for depression. Psychiatr Serv Wash DC 2011;62:740–6.