



Original article

Body Satisfaction in Early Adolescence: A Multisite Comparison


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A B S T R A C T

Purpose: This study assesses the relationship between unequal gender perceptions, socioecological factors, and body satisfaction among early adolescents in six urban poor settings in four countries.

Methods: A cross-sectional study, part of the Global Early Adolescent Study, was conducted in Shanghai, China; Cuenca, Ecuador; Kinshasa, DRC; and three cities in Indonesia: Denpasar, Semarang, and Bandar Lampung. Bivariate and multiple linear regressions were conducted to assess the relationships between body satisfaction, perceptions of gender norms, and socioecological factors. A final sample of 7840 respondents aged between 10 and 14 years were included in the analysis.

Results: Adolescents who endorsed more traditional sex roles and traits were more likely to be satisfied with their bodies in Kinshasa and Indonesia, while only endorsement of GST was associated with body satisfaction in Shanghai. Individual factors related to body satisfaction varied by site and included perceived health status, perception of body weight, height, and growth rate. Family and neighborhood factors related to increased body satisfaction varied by site and sex and included closeness to parents, parental communication, discussing bodily changes with anyone, parental awareness, and perception of neighborhood.

Conclusion: The results highlight the association between gender norms and social factors at individual, family, and neighborhood levels with body satisfaction. While associations differ significantly by site and sex, namely in perception of body weight and height, there exists commonalities that suggest body satisfaction, gender norms, and social context are intertwined.

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IMPLICATIONS AND CONTRIBUTION

This study assesses the relationships between gender norms, social contexts, and body satisfaction for young adolescents living in six low-income settings around the world. This study found that endorsement of gender stereotypical norms as well as social factors at individual, family, and neighborhood levels are significantly associated with adolescent body satisfaction. Gender norms and social context should be considered when addressing body satisfaction in adolescence.

There is perhaps nothing that more characterizes the transitions into early adolescence than the onset of puberty; and

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with it comes substantial body image change as well [1]. Such puberty associated changes have repeatedly been found to affect body satisfaction [2].

For young adolescents, given these rapid changes, it is not surprising that a focus on body image is a central concern for many [3–5]. A vast literature on body image or satisfaction (or more accurately dissatisfaction) suggests that these concepts are heavily gendered with dissatisfaction being reported up to three times more frequently among girls than boys (see, for example, the special edition of *Sex Roles* edited by Grogan [6]).

Additionally, there appears to be a strong age gradient with body dissatisfaction increasing across the adolescent years especially for girls [7–9].

Previous research, however, suffers from a number of limitations. First, the preponderance of research is from North America [10] and to a lesser extent from Europe [11]. Second, most research focuses on correlates related to body dissatisfaction, as opposed to body satisfaction; and third, most studies draw from clinical rather than population samples [5]. These limitations prevent us from understanding the extent to which adolescents in non-Western contexts perceive body satisfaction and the extent to which culture, gender, and context are related to body satisfaction. This is particularly important given that body dissatisfaction has been associated with a number of negative health outcomes such as eating and other mental health disorders [12,13]. Given the gendered nature of body image and satisfaction and in order to increase our understanding about body satisfaction and specifically the interface of body satisfaction with gender norms and context, we explore how young people's perceptions of gender norms, and especially unequal gender perceptions, relate to their own sexuality development in the form of body satisfaction and how these associations differ for boys and girls and by geography. The framework guiding the present analyses has been articulated by Pulerwitz, Blum, Cislaaghi et al. Specifically, the framework suggests that social and gender norms evolve from multiple influences from the social, individual, and institutional spheres and that gender norms influence how young people (and all people) are socialized [14]. The model stresses the influences that maintain current gender norms which, among other things, significantly influence body image and thus satisfaction. The present study explores a number of factors relevant for each of the spheres.

Methods

The current analyses are based on data drawn from the Global Early Adolescent Study (GEAS) which is a 10-country (12-site) study that examines the influence of gender on health behaviors and outcomes among early adolescents (aged 10–14 years) living in poor urban settings. For this article, we use baseline data available from six urban sites: Kinshasa, DRC; Shanghai, China; Cuenca, Ecuador; and three sites in Indonesia: Denpasar, Semarang, and Bandar Lampung (analyzed collectively as Indonesia) (see manuscript by Mmari, K. et al. in this volume for site details). Together these sites represent vastly different social, economic, geographic, and environmental settings and were selected because they all shared a common protocol and core survey instrument. Sampling strategies and data collection modes varied across sites. Each site received ethical approval from their local institutional review boards and the study in each site was also approved or deemed exempt by the Johns Hopkins Bloomberg School of Public Health institutional review board.

Study population

In all sites except Kinshasa, a two-stage sampling procedure was conducted, consisting of school sampling, followed by the inclusion of students in the selected schools. In Kinshasa, due to relatively low school matriculation, a sample of out-of-school adolescents was also included. In all sites, eligible adolescents were recruited initially based on the core inclusion criteria: 1) aged 10–14 years at the time of interview; 2) received adolescent

assent and active parent consent for study participation. Further exclusion from the analytic sample included 15% or more missing responses or in Kinshasa having at least two negative interviewer assessments including poor response accuracy and/or compromised understanding of survey questions.

The initial sample across all sites was 9426; however, due to missing data relevant for the present analyses, the final analytical sample used for all analyses was 7840. Comparing the full and analytic sample by age and sex, no significant differences were noted.

Measures

Data collection took place between June 2017 and June 2019 and entailed a 1–2 hours self-administered survey completed on tablets, using computer-assisted self-interview or audio-computer-assisted self-interview, with the exception of Kinshasa where, due to low literacy of respondents, the survey was completed by interviewers. The survey collected information on a range of topics including young people's sociodemographic characteristics, their family, peer, school and neighborhood environments, their physical, mental and sexual health, and their perceptions of gender norms in their context. A description of GEAS survey instruments is available at <https://www.geastudy.org>.

Outcome measure

Body Satisfaction Index: Seven questions on body satisfaction were asked, each with a 5-point Likert scale from agree a lot to disagree a lot. Affirmative questions included 1) on the whole, I am satisfied with my body; 2) I like the way I look; 3) I like looking at my body; and 4) I feel like I am handsome/beautiful. Negative questions included 1) I worry about the way my body looks; 2) I often wish my body was different; and 3) I am worried that my body is not developing normally. The Body Satisfaction Index was derived from a measure originally developed for the Health Behaviour of School age Children [15]. Body satisfaction questions were piloted initially with 120 young adolescents in each of 15 countries as part of the larger GEAS pilot conducted between 2015 and 2017. Subsequently, they were repiloted with 60 young adolescents from each of six communities on five continents. Exploratory factor analysis for body satisfaction indicated two factors with a factor loading of the four affirmative items above .40 in all sites and an ordinal Cronbach alpha of .80, .78, .73, and .77 for Kinshasa, Shanghai, Cuenca, and Indonesia, respectively. For the negative questions, the factor loading was low with an ordinal Cronbach alpha of .69, .58, .52, and .54, respectively. Based on these analyses, the decision was to retain only the affirmative questions. Mean scores of body satisfaction were calculated as the average across the four affirmative items which ranged from one to 5.

Key predictors

Young people's perceptions of gender norms examined two gender domains: gender stereotypical traits (GST) and gender stereotypical roles (GSR). Both measures were based on two scales: the GST comprising seven items contrasting male toughness and female vulnerabilities and the GSR comprising four items portraying male power over household decisions. Each scale was dichotomized according to mean scores in each

site with those above the mean as high (GST: high vs. low and GSR: high vs. low). The psychometric properties of these two scales have previously been reported [16].

We considered a set of factors based on the body dissatisfaction literature, as well as the Pulerwitz et al. framework previously noted [14]. At the individual level, we considered young peoples' overall perception of health (good/excellent vs. poor/fair), perception of weight (too thin/too fat/right weight) and height (too tall/too short/right height), perception of growth rate (slower than peers/faster/same rate), puberty status (pre-pubertal/pubertal), and importance of religion (important/not important) [17–19]. At the interpersonal level, we assessed family and peer relations including caregiver closeness (feeling close to caregiver/no caregiver or not feeling close), caregiver awareness (high/no caregiver or no/low awareness), caregiver's interest in adolescent's thoughts and feelings (yes/no), adolescents' comfort talking with caregivers (yes/no), number of male friends (0, 1–3, >3), number of female friends (0, 1–3, >3) and communication about body changes (ever talked with someone (yes/no)). Finally, at the community level, we considered neighborhood caring (yes/no).

Analysis

We first examined the distribution of all predictors by sex within each site; and categorical variables were compared by chi-squared test or Fisher's exact test [20]. In each site, sex-stratified mean scores of body satisfaction (range: 1–5) were calculated according to each gender norm perception measure and other individual, interpersonal and community factors and significance testing was conducted using Student t-test or Wilcoxon rank-sum test based on normality and equal variance between groups. Kruskal-Wallis H Test was additionally performed to assess differences in levels of body comfort and median scores of each gender norm scales cross four countries. We applied Bonferroni correction for *p*-values from multiple comparisons for gender norm scores. To help interpret site varied findings and

also to assess if sex modified the associations within each country, we conducted interaction analyses by sex within each site and also by sites among boys and girls, respectively. Benjamini-Hochberg method was applied to account for multiple tests with a false discovery rate of 5%. Interaction assessment results were presented in Appendix Tables 1–3. Bivariate and multiple linear regressions were conducted to assess the relationships between body satisfaction, social and contextual factors and perceptions of gender norms, adjusting for other covariates and by sex. All analyses were performed using Stata version 14 (StataCorp, LLC, Texas).

Results

Table 1 presents the characteristics of the sample in each site. The mean age of respondents across sites ranged from 11.92 to 12.47 years. The vast majority (ranging from 70% to 85.6%) considered themselves to be in good or excellent health. Relations with parents varied across sites, with 55%–77.7% reporting that they had a close relationship. Just over half of adolescents felt comfortable talking with their parents about problems, worries or body changes; and 34%–60% had discussed body changes with someone.

Based on mean scores of body satisfaction, we found that across sites adolescents were moderately to highly satisfied with their bodies, with mean scores ranging from a low of 3.34 among girls in Shanghai to a high of 4.56 among boys and girls in Kinshasa (on a scale of a maximum of 5). The high levels of body satisfaction in Kinshasa were reflected in the fact that 80% of all respondents (both boys and girls) agreed with all four positive statements about body satisfaction, while less than one percent of adolescents in Kinshasa did not endorse any of the positive items. This is in contra-distinction to both Shanghai and Indonesia where nearly a quarter of girls and approximately one-in-eight boys did not endorse a single positive body satisfaction item. In both Asian settings, Indonesia and Shanghai, girls were consistently less satisfied with their bodies than boys

Table 1
Description of study populations by site

Individual and family characteristics	Kinshasa N = 2809	Shanghai N = 1714	Cuenca N = 614	Indonesia N = 4289
Mean age (standard deviation)	11.92 (1.38).	12.47 (.96)	12.00 (1.36)	12.18 (.54).
Rural-urban migration	35.1	25.3	6.1	29.2
Overall health				
Good/excellent	85.6	85.2	81.6	70.3
Fair/poor	14.4	14.8	18.4	29.7
Perception of weight				
Right weight	49.1	31.3	54.3	37.1
Too fat	22.6	47.6	19.0	30.4
Too thin	28.3	21.1	26.7	32.5
Perception of height				
Right height	40.3	43.5	47.4	33.2
Too tall	40.5	15.0	25.7	48.2
Too short	19.2	41.5	27.0	18.6
Perception of growth rate				
Same	38.3	46.9	52.8	56.3
Faster	27.8	16.0	12.7	14.5
Slower	31.3	23.9	22.8	12.3
Do not know	2.6	13.2	11.4	16.5
Ever been in love	11.8	28.0	67.9	69.0
Parent closeness	60.6	55.4	77.7	63.3
Parent caring	69.4	55.7	82.9	75.9
Comfortable talking with parent ^a	50.0	50.8	59.0	50.9
Parents aware (about their grades, their friends' name, where they are)	38.1	83.0	76.4	63.0
Ever discuss body changes	38.5	34.5	60.1	50.5

^a Comfortable talking with parent is the composite of three items: comfortable talking to parents about: body changes, things that worry you, problems with boyfriend/girlfriend.

Table 2

Distribution of agreement with the number of statements about body comfort by site and sex

Body satisfaction: Number of positive statements about the body that were endorsed (total of 4 statements)	Kinshasa		Shanghai		Cuenca		Indonesia	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
	N = 1393	N = 1397	N = 852	N = 832	N = 306	N = 294	N = 1955	N = 2213
	%		%		%		%	
None	0.9	0.9	12.7	21.2	2.0	5.4	15.0	23.5
1	1.6	1.5	21.0	24.9	5.6	4.8	13.6	20.3
2	4.3	4.2	22.1	23.9	19.3	14.3	17.5	18.2
3	14.1	14.2	24.1	20.2	36.3	33.7	23.0	18.7
4	79.1	79.2	20.2	9.9 ^a	36.9	41.8	30.9	19.3 ^a
Mean score (SD) of body satisfaction on a scale from 1 to 5	4.65 (.61)	4.65 (.57)	3.64 (.86)	3.34 ^a (.81)	4.05 (.75)	4.02 (.87)	3.79 (.81)	3.50 ^a (.75)

^a Significant difference between boys and girls in the distribution of number of items endorsed or in the mean score of body satisfaction at $p < .05$, $< .01$, or $< .001$ respectively.

(3.34 +/- .81 vs. 3.64 +/- .86) and (3.50 +/- .75 vs. 3.79 +/- .81, respectively).

When we look at distribution of responses to the gender stereotypic traits and roles measures we see that in Kinshasa the vast majority of both boys and girls endorse traditional hegemonic traits (with a mean score of 4.46 (out of 5). This compares with a mean score of 3.89 in Indonesia, 3.35 in Cuenca, and 3.32 in Shanghai indicating that of these study sites Shanghai and Cuenca were least likely to endorse GST. When we look at endorsement of GSR, we see a fairly similar pattern with a mean score in Kinshasa of 4.43 (with five being the most gender unequal), 3.89 in Indonesia, 2.62 in Shanghai, and 2.23 in Cuenca.

Results from bivariate analysis stratified by sex show that generally young adolescents who perceived more traditional gender roles and traits reported greater body satisfaction, and these associations were statistically significant in every setting except Cuenca (Table 4). This held true in stratified analyses by sex (Table 4).

Individual factors that were associated with body satisfaction in most of the settings include: perceptions of height, weight, growth, and overall health. Looking at each of these factors separately, we found that viewing oneself as too thin (as compared with perception of right weight) was associated with lower levels of body satisfaction among adolescents in Kinshasa, as well as boys in Shanghai ($p < .05$) and Cuenca ($p < .05$). On the contrary, viewing oneself as too fat was associated with lower levels of body satisfaction among adolescents in Shanghai and Indonesia, as well as girls in Kinshasa and boys

in Cuenca. With the exception of Cuenca girls, seeing oneself as the right height was generally associated with greater body satisfaction than too tall or short. Consistent with these findings, viewing oneself as either being an early or late developer was negatively associated with body satisfaction in Kinshasa, Shanghai, and Indonesia compared to those who believed themselves at the same developmental pace with peers. Adolescents from all sites reported greater body satisfaction if they indicated they were in good/excellent health compared to peers with perceived poor/fair health. Additionally, adolescents who already started puberty were more likely to be satisfied with their bodies in Kinshasa (for boys only) and Indonesia.

Analyses also indicated that adolescents who had talked with anyone about body changes had greater body satisfaction in all sites (except for boys in Kinshasa and Cuenca). Positive relationships with parents were also closely aligned with body satisfaction. Specifically, in all settings, adolescents who felt close with parents, who reported feeling comfortable talking with parents or thought their parents cared about their thoughts and feelings reported greater body satisfaction than those with less parental connection. In addition to parents, adolescents who perceived to be cared for by their neighbors, also expressed higher body satisfaction compared to those without such neighborhood connections.

In multivariate analyses, adolescents' gender norms perceptions remained significantly related to body satisfaction, although strength of associations varied across settings. Adolescents who scored high in both GSR and GST—which is to say

Table 3

The distribution of endorsement of stereotypical traits (GST) and gender stereotypical roles (GSR) by site

	Kinshasa	Shanghai	Cuenca	Indonesia
GST				
Boys should be raised tough so they can overcome any difficulty in life.	85.3	33.7	65.5	77.4
Girls should avoid raising their voice to be ladylike.	79.1	50.2	51.6	61.6
Boys should always defend themselves even if it means fighting.	84.6	36.3	49.4	47.7
Girls are expected to be humble.	96.2	43.2	78.7	72.0
Girls need their parents' protection more than boys.	85.1	47.3	75.1	75.4
Boys who behave like girls are considered weak.	84.9	37.1	37.1	42.6
It's important for boys to show they are tough even if they are nervous inside.	85.6	60.5	40.6	50.3
Median score (SD)	4.71 (.66)	3.28 (.74)	3.43 (.88)	4.0 (.69)
GSR				
A woman's role is taking care of her home and family.	89.2	29.8	52.6	64.7
A man should have the final word about decisions in the home.	89.5	24.7	26.3	51.7
A woman should obey her husband in all matters.	92.9	11.6	15.9	54.9
Men should be the ones who bring money home for the family, not women.	68.1	24.2	13.2	68.1
Median score (SD)	4.75 (.75)	2.75 (.95)	2.0 (1.02)	4.0 (.95)

Table 4

Association between mean scores of body satisfaction, perceptions of gender norms and adolescents' individual characteristics and social environments: results from bivariate analysis by site

Factors		Kinshasa		Shanghai		Cuenca		Indonesia	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
		Unadjusted linear regression coefficients							
GSR (ref: low)	High	.10**	.11***	.07	.17**	.14	.06	.30***	.27***
GST (ref: low)	High	.18***	.15***	.19**	.24***	.12	-.01	.45***	.40***
Feel close to parent(s) (ref: no)	Yes	.16***	.15***	.09	.36***	.19	.31*	.14***	.15***
Parent(s) care about their thoughts and feelings (ref: no)	Yes	.16***	.15***	.12*	.37***	.17	.49***	.12**	.14***
Comfortable talking with parent(s) (ref: no)	Yes	.04	.12***	.19**	.26***	.29**	.32**	.15***	.10**
Parent(s) aware about friends, academic performance, whereabouts (ref: no)	Yes	.07*	.16***	.11	.28**	.02	.13	.15***	.11**
People in my neighborhood care about me (ref: no)	Yes	.09**	.08*	.15*	.25***	.11	.18	.19***	.12**
Puberty status (ref: no)	Yes	.05	.09*	-.12	-.10	-.16	-.07	.35***	.17*
Perception of Health (ref: poor/fair)	Good/excellent	.20***	.27***	.73***	.36***	.25	.14	.50***	.35***
Perception of weight (ref: right weight)	Too thin	-.20***	-.22***	-.19*	.04	-.22*	-.18	-.00	-.04
	Too Fat	-.01	-.08*	-.32***	-.33***	-.35**	-.86***	-.21***	-.19***
Perception of height (ref: right height)	Too tall	-.06	-.06	.09	-.09	-.22*	-.19	.12**	.01
	Too short	-.11*	-.27***	-.17**	-.20**	-.01	-.19	-.20***	-.12**
	Perception of growth (ref: same rate)	Too Fast	-.02	-.02	-.01	-.36***	-.20	-.06	.31***
Ever talked about body changes with someone (ref: no)	Do not know	-.12**	-.15***	-.12	-.14*	.04	.15	-.20**	-.11*
	Yes	-.15	-.15	-.35***	-.29**	-.14	-.18	-.02	-.11*
	Yes	-.01	.08*	.19**	.12*	.04	.32**	.29***	.22***

*p < .05.

**p < .01.

***p < .001.

Note that for gender stereotypic roles (GSR) and gender stereotypic traits (GST) higher mean scores indicate endorsement of more traditional (non-egalitarian) values.

those who endorsed more traditional sex roles and traits—were more likely to be satisfied with their bodies in Kinshasa and Indonesia, while only high GST scores remained significant for girls in Shanghai (Table 5).

Few individual factors were consistently related to body satisfaction by site and sex, after adjustments for other

covariates. The exception was perceived health status, which was positively associated to body satisfaction among boys and girls in three settings. While perception of being too fat was negatively associated with body satisfaction among girls in Shanghai, boys in Cuenca, and both boys and girls in Indonesia, the perception of being too thin was negatively associated with body satisfaction

Table 5

Associations between means scores of body satisfaction perceptions of gender norms and adolescents' individual characteristics and social environment, by site and sex (based on multiple linear regression)

Factors		Kinshasa		Shanghai		Cuenca		Indonesia	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
		N = 1230	N = 1271	N = 683	N = 737	N = 243	N = 240	N = 1578	N = 1858
Adjusted linear regression coefficients									
GSR (ref: low)	High	.08*	.06	-.02	.14*	.08	-.10	.15***	.13***
GST (ref: low)	High	.11***	.10**	.16**	.19**	.09	-.12	.32***	.33***
Puberty status (ref: prepubertal)	Pubertal	.04	.05	-.14	-.05	-.04	-.20	.19**	.04
Feel close to parents (ref: no)	Yes	.10*	.08*	-.07	.14*	.13	.12	.09*	.08*
Parents care about their thought/feeling (ref: no)	Yes	.06	.04	.05	.21**	.01	.32*	-.02	.005
Comfortable talking with parents (ref: no)	Yes	-.03	.02	.16*	.09	.23*	.20	.09*	.07*
Parent awareness (friends, grade, etc.) (ref: no)	Yes	.03	.10**	.09	.02	-.13	-.02	.06	.01
People in my neighborhood care about me (ref: no)	Yes	.05	.06	.07	.15*	.007	.09	.14**	.02
Overall perception of health (ref: poor/fair)	Good/excellent	.17***	.18***	.66***	.21**	.05	-.13	.34***	.25***
Perception of weight (ref: right weight)	Too thin	-.14***	-.17***	-.01	.17*	-.15	-.11	-.01	-.06
	Too fat	.01	-.02	-.25***	-.15*	-.26*	-.75***	-.20***	-.21***
Perception of height (ref: right height)	Too tall	-.02	.01	.15	-.12	-.17	-.10	.09*	.01
	Too short	-.01	-.21***	-.14	-.17**	.07	-.14	-.12*	-.05
Perception of growth (ref: same rate)	Faster	.04	-.04	-.04	-.23**	-.24	.08	.14**	.20***
	Slower	-.12**	-.06	.002	-.12	.06	.14	-.14*	-.11*
	Do not know	-.06	-.16	-.22*	-.15	.06	-.22	.01	-.01
Ever talked about body changes with someone (ref: no)	Yes	-.01	.04	.17*	.22***	-.04	.21	.12**	.16***

*p < .05.

**p < .01.

***p < .001.

among adolescent boys in Kinshasa whereas a positive relationship was revealed for girls. Similarly, the perception of being too short was negatively associated with body satisfaction among girls in Shanghai and boys in Indonesia, while the perception of being more developed than peers was positively associated with body satisfaction for boys and girls in Indonesia, but negatively associated with body satisfaction for girls in Shanghai (Table 5).

While factors within adolescents' social contexts were significantly associated with body satisfaction, the association also varied across settings and by sex. Specifically, closeness to parents was related to body satisfaction only for boys and girls in Indonesia and Kinshasa. Parental communication was associated with body satisfaction for both sexes only in Indonesia, and having discussed bodily changes with anyone was significantly related to body satisfaction in Indonesia and Shanghai. Parental awareness was significantly related to body satisfaction only for girls in Kinshasa. Perceiving that there are caring people in the neighborhood was positively associated with body satisfaction for girls in Shanghai and for boys in Indonesia.

Discussion

These analyses highlight the extent to which body satisfaction differs between boys and girls across four distinct geographies and cultures and the extent to which gender norms, as well as individual, family, and neighborhood level factors relate to body satisfaction. Notable was that adolescents in Kinshasa were the most likely to be satisfied with their bodies and those in Shanghai were least likely to be satisfied. Surprisingly, sex differences in body satisfaction were only apparent in the two Asian settings, where girls were less satisfied than boys. This suggests that perhaps culture and context influence adolescent perceptions of body dissatisfaction and that the gendered nature of body dissatisfaction may not be a universal phenomenon [11,13]. This is consistent with racial and ethnic comparisons of body satisfaction in North America where White women have been repeatedly found to value thinness more than black women [21] and Black women are less likely to express body dissatisfaction [22]. In the United States, Asian American women are also more likely to endorse thinness as a component of body satisfaction than other ethnic groups [23]. A high premium on thinness has also been reported in China [24]. In a 26 country study of female body dissatisfaction, Swami et al. [25] found that the ethnic differences in body satisfaction was more pronounced in lower as compared with higher income settings within countries.

Equally unanticipated were the associations between body satisfaction, GSR, and GST. While we hypothesized that those with more gender equal attitudes would also have more body satisfaction, that did not prove to be the case [26]. Rather, we found that there was a positive association between GST for both boys and girls in Kinshasa and Indonesia and for girls in Shanghai, with similar associations among boys and girls for GSR in Indonesia and Kinshasa. Given that higher GSR and GST scores are associated with more hegemonic or traditional norms, we are puzzled as to why adolescents who perceive such traditional gender norms would be more satisfied with their bodies.

There are a number of plausible explanations for our findings. Holmqvist-Guttario [11] has hypothesized that even in countries such as Sweden where policies espouse equality, inequalities in power (e.g. in wages) persist and these impact perceptions of

one's body. Voelker et al. [18] have also suggested that adolescents who endorse more traditional gender roles may be more heavily influenced by media body image ideals. This is consistent with what Swami et al. also found [25]. While plausible in higher income settings, it does not explain the strong associations we found in Kinshasa where media penetration is low. Rather, it may be that social change challenging traditional norms is uncomfortable—a discomfort reflected in the relationships we see between traditional gender roles and traits and body satisfaction; and conversely, endorsing traditional gender stereotypic norms and traits may be more socially sanctioned and thus reinforced. There is evidence, for example, that there is a relationship between social change and depression for adolescents that has been referenced to explain the rise in adolescent suicidality in a number of sub-Saharan countries [27]. A similar dynamic may be at play here. It also may be that at different stages of development there are variable levels of comfort that could confound the associations that we find; however, the work of McCabe and Ricciardelli [28] would not support this hypothesis. Greater clarity awaits future research.

One of the most consistent predictors of body satisfaction in our study was self-perceived health. With the exception of Cuenca, adolescents who perceived their health as good to excellent were more likely to report greater body satisfaction compared to those who deemed their health fair or poor. These findings are in line with those of Meland et al. [19] in the Norwegian Health Behaviour of School-aged Children Study and also that of Field and Thompson [29] suggesting that body satisfaction may very well be a proxy for an overall sense of health and well-being.

Similarly, we found that perceived weight and height were closely aligned with body satisfaction, although the direction of the relationship depended on the site. Adolescents who perceived themselves as too fat in Shanghai, Indonesia, and Cuenca were less satisfied with their bodies, while being too thin was associated with less body satisfaction in Kinshasa. Here again, the differences may reflect Voelker et al. [18] observations of body satisfaction reflecting media defined body ideals. The Kinshasa findings may also reflect the relationship between health status and body satisfaction in that community with thinness associated with poorer health status. Conversely, it may reflect different norms of beauty in sub-Saharan Africa compared with other sites. Ozodiegwu et al. reflect this perspective noting that adolescent females in sub-Saharan Africa aspired not to obesity but to being voluptuous [30]. Likewise, Scott et al. note that historically being heavy has been seen as a sign of prosperity not obesity [31]. What is clear is that community gender norms do appear to influence weight and a host of other health-related outcomes [32].

Being out of sync with peers on pubertal timing, whether it was too slow (as in Indonesia and Kinshasa and girls in Indonesia) or too fast (as seen for boys and girls in Indonesia and Shanghai), was associated with less body satisfaction. This is supported by studies in the United States, which have shown that boys who were slow maturers and girls who were fast maturers have less body satisfaction than normally developing peers [10,33]. Consistent with the research of McCabe and Ricciardelli [28], we found that whether puberty had commenced was not an important factor for body satisfaction. A more finely graded assessment of pubertal status might yield different results.

Finally, turning to family influences, we found that closeness to parents was significantly related to body satisfaction among

adolescents in Kinshasa and Indonesia, and among girls in Shanghai. While most of the research to date has been conducted in North America, previous research has also found positive relationships between parental support and body satisfaction [18]. Byely et al. [27] hypothesize family influence works through one or more of the following mechanisms: modeling behavior, direct communications, and/or perceptions of family relationships. Given that parenting factors exerted different associations to body satisfaction across sites and across sex, more research is needed to understand exactly how parenting might influence body satisfaction across different cultural settings.

Limitations

While this is the first community-based cross-national study of body satisfaction among young adolescents in low- and middle-income countries, there are a number of limitations worth noting. First, for none of the sites is there a national or even city-wide representative sample. Rather, the samples were purposively drawn to include the lowest income sectors of their urban communities. The lack of socioeconomically diverse populations may further limit generalizability; however, the rationale to restrict the study's focus on low-income young people is that they have been shown to sustain the greatest burden of gender inequality in low- and high-income countries (see, for example, child marriage and early school leaving).

Additionally, the sample size was small in Cuenca, which may have resulted in a lack of statistical power in this site.

Finally, we were not able to examine body dissatisfaction from the three negative questions asked, as they could not be scaled. Body satisfaction among early adolescents might be nuanced and sometimes contradictory, which could not be captured with our measure.

Adolescence is a pivotal time for formation of body image and comfort [18]. The present study focuses on body satisfaction. We explore these relationships among young adolescents 10–14 years of age where pubertal development and physiological changes are most dramatic and the potential consequences on body comfort the greatest [28,33]. We explore the factors associated with body comfort in four very different cultural and geographic contexts taking a population rather than clinical perspective; and while we are left with significant site differences we also see cross-site commonalities that suggest that self-perceived body comfort and health are intertwined.

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