Journal of Adolescent Health 60 (2017) S15–S21

ELSEVIER

JOURNAL OF ADOLESCENT HEALTH

www.jahonline.org

Original article

Inequitable Gender Norms From Early Adolescence to Young Adulthood in Uganda: Tool Validation and Differences Across Age Groups

Lung Vu, M.D., Ph.D. [a,*], Julie Pulerwitz, Sc.D. [a,*], Brady Burnett-Zieman, M.P.H. [a], Cecily Banura, Ph.D. [b], Jerry Okal, Ph.D. [c], and Eileen Yam, Ph.D. [a]

[a] *Population Council, Washington, D.C.*
[b] *Child Health and Development Center, Makerere University College of Health Sciences, Kampala, Uganda*
[c] *Population Council, Nairobi, Kenya*

Article history: Received April 14, 2016; Accepted September 30, 2016
Keywords: Gender norms; Adolescents; GEM scale; Scale validation; Confirmatory factor analysis; Uganda

A B S T R A C T

Purpose: We aimed to describe and compare gender norms among 10- to 14-year-olds versus 15- to 24-year-olds and to conduct a rigorous evaluation of the GEM Scale's performance among these two age groups.
Methods: We conducted a two-stage cluster-sampled survey among 387 females and 583 males, aged 10–24 years, in rural and urban communities near Kampala, Uganda. We applied, assessed, and adapted the GEM Scale (Pulerwitz and Barker, 2008), which measures views toward gender norms in four domains. We describe levels of support for (in)equitable norms, by gender and age, and associations with key health outcomes (partner violence). Confirmatory factor analysis and multi-group measurement invariance analysis were used to assess scale performance.
Results: All participants reported high levels of support for inequitable gender norms; 10- to 14-year-olds were less gender equitable than their older counterparts. For example, 74% of 10- to 14-year-olds and 67% of 15- to 24-year-olds agreed that "a woman should tolerate violence to keep her family together." Comparing responses from males and females indicated similar support for gender inequity. Analyses confirmed a one-factor model, good scale fit for both age groups, and that several items from the scale could be dropped for this sample. The ideal list of items for each age group differed somewhat but covered all four scale domains in either case. An 18-item adapted scale was used to compare mean GEM Scale scores between the two age groups; responses were significantly associated with early sexual debut and partner violence.
Conclusions: Young people internalize gender norms about sexual and intimate relationships, and violence, at early ages. Programs to address negative health outcomes should explicitly address inequitable gender norms and more consistently expand to reach younger age groups. In this first application of the GEM Scale among 10- to 14-year-olds, we confirm that it is a valid measure in this setting.

IMPLICATIONS AND CONTRIBUTION

This study demonstrates that the GEM Scale is a quantitative tool that can be successfully used to measure views toward gender norms among both male and female youth in Uganda aged 10–24 years. Results highlight the need to implement gender-transformative programs and especially to expand their typical audience to 10- to 14-year-olds, in Uganda and similar contexts, ultimately preventing associated negative social and health outcomes.

Conflicts of Interest: The authors report no potential, perceived, or real conflict of interest.
Disclaimer: Publication of this article was supported by the International HIV/AIDS Alliance, under the Link Up project funded by the Ministry of Foreign Affairs of the government of the Netherlands. The opinions or views expressed in this supplement are those of the authors and do not necessarily represent the official position of the funder.
* Address correspondence to: Lung Vu, M.D., Ph.D., Population Council, 4301 Connecticut Ave, NW, Suite 280, Washington, DC 20008.
E-mail addresses: lvu@popcouncil.org (L. Vu); jpulerwitz@popcouncil.org (J. Pulerwitz).

1054-139X/
http://dx.doi.org/10.1016/j.jadohealth.2016.09.027

Gender norms—defined as societal expectations about men's and women's roles, rights, and responsibilities [1–3]—can strongly influence a number of behaviors, including health behaviors [4,5]. When these norms are inequitable, they can, e.g., support sexual risk-taking [6,7] and intimate partner violence [8–10], which are in turn associated with negative health outcomes such as HIV and other sexually transmitted infections [11–13]. They also can reinforce power imbalances that often subordinate women and grant men disproportionate power in decision-making and negotiating sexual relationships [3,14–17].

Young people are exposed to societal messages related to appropriate gender norms early in life, and by adolescence, norms may be incorporated into a young person's worldview. In fact, developmental psychologists have demonstrated that messages around gender roles are transmitted before adolescence [18]. However, the degree to which these views are fixed prior to adolescence is unclear. Moreover, many health-related behaviors that are influenced by inequitable gender norms are not common until adolescence or later. Thus, adolescence (and especially early adolescence) presents a window of opportunity for interventions that interrogate gender norms and discuss health behaviors, before these behaviors begin to manifest [18]. Such interventions could influence gender norms at a time when adolescent gender socialization processes are under way [19–21]. Indeed, the views toward gender norms acquired during adolescence often influence behaviors later in life [22,23] and may be among the most influential social determinants of health [24]. It is, therefore, important to understand how young people view gender norms at different ages—as well as the different perspectives of adolescent boys and girls, and of married and unmarried young people.

Over the past 15 years or so, a number of sexual and reproductive health–focused programs across the global South have sought to shift gender norms in a direction that increases equity [25,26]. A tool that has often been used to measure the effects of these "gender-transformative" programs is the GEM Scale [27]. It was developed to meet the need for a reliable and easily administered tool that could measure views toward gender norms regarding sexual health, violence, and intimate partnerships at a given point in time and that could capture shifts in these views after a program had been implemented. Although several scales had been developed to assess gender norms [28], few were focused on these topics and applicable in these programmatic settings. Over time, the GEM Scale has been validated and used in a number of different country settings, with people ranging from fifteen to 60 years old, and among both boys/men and girls/women [27,29–34].

Global efforts for youth have tended to focus on measuring and shifting gender norms among the 15- to 24-year-olds [8,23,26,30]. Far less is known about views toward gender norms, and the potential to shift these norms, among early adolescents (aged 10–14 years). Meanwhile, calls for increased attention to and investment in the sexual and reproductive health and rights of early adolescents, particularly adolescent girls [16,17], have led to new programming [17,31,32], and a related need to measure their effects. The present study applies the GEM Scale to a representative sample of 10- to 24-year-old Ugandan youth to: enable an exploration of their views toward gender norms and a comparison across different ages, test the relationship between these views and key sexual and reproductive health and right outcomes, and examine the usefulness of the scale for 10- to 14-year-olds.

Methods

Study design and participants

A two-stage cluster-sampled household survey was conducted from July 2015 to September 2015. Eligible participants were males and females between 10- and 24-years old, who lived in Wakiso and Kampala Districts, Uganda. These districts were selected to provide a representative sample of rural and urban communities: Kampala district is entirely urban, whereas 92% of the population of Wakiso District—which immediately surrounds the city of Kampala—live in rural areas.

A list of enumeration areas (EAs) used in the 2014 census was obtained from the Uganda National Bureau of Statistics. In the first stage, census EAs were randomly selected in each district; a total of 24 EAs were selected for the study. In the second stage, approximately, 40 households were systematically selected in each EA (to yield the desired sample size). Finally, data collectors used the Kish Grid system (Kish L. Survey Sampling. New York: John Wiley and Sons, Inc.; 1965.) to construct a list of eligible individuals in each selected household and randomly select one participant per household (for a total of 960 individuals in the sample).

Using the Kish Grid, the data collectors first listed males presently residing in the house in order of decreasing age, followed by females in the same order. One person was selected from this list using a random number table. If the prelisted individual did not meet eligibility criteria, the second was screened, and so on. The survey was conducted in the participant's household and took an average of 40 minutes to complete. Depending on participant preference, face-to-face interviews were conducted in either Luganda—the predominant local language—or English. The surveys were written in English, translated to Luganda, and then back-translated to English. Survey questions covered sociodemographic background, acceptance of (in)equitable gender norms, sexual behaviors, and experience with violence.

Measures

To assess views toward gender norms, we applied the GEM Scale [33]. The items addressed support for inequitable gender norms in four content domains: violence, reproductive health and disease prevention, sexuality, and domestic chores and daily life. Response categories included "agree," "partially agree," and "do not agree." We coded all items such that a higher score represented support for more equitable gender norms.

Statistical analysis

Factor structure. As the scale had been widely used among 15- to 24-year-olds, but never among 10- to 14-year-olds, we analyzed the data separately for the two age groups: 10–14 (N = 297) and 15–24 years (N = 663). Power analyses indicated that these sample sizes were adequate for a validation study using confirmatory factor analysis (CFA; data not shown) [35]. Prior research had determined that the scale had one factor for the 15- to 24-year-old population [33]. To assess the factor structure when applying the scale with a new subpopulation, we used exploratory factor analysis (EFA)—with scree plots, Kabacoff's parallel analysis, and Velicer's Minimum Average Partial—to determine if we would again find one factor [36]. During EFA, we specified a

range of factors and used oblique rotation methods to produce factor loadings. Oblique rotations were used because of a high expectation of correlation between factors [36]. We subsequently calculated factor loadings to assess item relationships with underlying factors; items with factor loadings of .3 or greater were retained [37,38].

Construct validity. After identifying a similar one-factor structure with EFA, we then performed two separate CFAs using the structural equation modeling technique—and with multi-group measurement invariance analysis—for participants aged 10-14, and participants aged 15-24. CFA examines how well the GEM Scale model fits the data [39]. Good-fitting models are indicated by a Tucker-Lewis (TLI) and Comparative Fit Index (CFI) greater than .90 and a Root Mean Square Error Approximation (RMSEA) less than .08 [40–42]. Multi-group invariant (MI) analysis was performed to determine whether the item loadings were the same across the two age groups and across the male and female groups.

Internal consistency reliability. The default for estimating internal scale consistency is typically the coefficient alpha. However, the coefficient alpha can become negatively biased when a Likert response format with fewer than five points is used, as is the case with the GEM Scale [43]. In such instances, the ordinal coefficient theta has been recommended as a more suitable alternative to coefficient alpha, as interpretation is similar but ordinal theta avoids this propensity for negative bias [43]. We provide both coefficient alpha and ordinal theta results when assessing internal consistency reliability.

Descriptive analysis of views toward gender norms and associations with HIV-related outcomes. We coded the answer choices of individual items as "agree"/"partly agree" (0) or "disagree" [1]. To compare responses to individual items, we used chi-square tests. To create the GEM Scale, we summed the responses to the items; thus, a higher number is a more equitable score. To enable a comparison of the GEM Scale scores across the two age groups, we selected the 18 items that worked best across the groups. Specifically, items 3, 5, 8, 12, 13, and 18 had low factor loadings for both age groups and were dropped (see findings section for more detail). We then used *t*-tests to compare the mean scores of the 18 item scale across the two age groups.

Finally, we assessed bivariate relationships between views toward gender norms and several key health-related outcomes, including age of sexual debut, condom use at last sex, and experience of physical and/or sexual partner violence. Experience with physical or sexual violence was measured during the past 12 months. The analysis focused on 15- to 24-year-olds, as only a few 10- to 14-year-old respondents reported previous sexual experience. Statistical significance was determined at p value $\leq .05$. Weights corresponding to the differences in cluster and household size were calculated and taken into account in the analysis. All analyses were conducted using Stata software, version 13 (StataCorp, College Station, TX).

Ethical approval

The study was approved by the Institutional Review Board of the Population Council (New York), the Research Ethics Committee of Makerere University (Kampala), and the Uganda National Council of Science and Technology (Kampala). We obtained written consent from adult participants and emancipated minors—who were defined by the Uganda National Guidelines for Research involving human participants, as being aged 15–17 years who are pregnant, married, have a child, or cater for their own livelihood [44]—and from the parents or guardians of other participants aged 10–17 years old.

Table 1
Characteristics of the study population (N = 960)

	Weighted frequency (%)
Residence	
Kampala	62.4
Wakiso	37.6
Sex	
Male	40.4
Female	59.6
Age	
10–14 years old	33.7
15–24 years old	66.3
Currently attending school	
Yes	41.5
No	58.5
Highest level of school attended	
No education	.5
Primary	43.6
Secondary	46.7
Tertiary	9.2
Marital status	
Never married/single	86.8
Never married/living with a sex partner	4.4
Married	7.4
Divorced/separated/widowed	1.4
Ever had sex	
No	52.3
Yes	47.7

The analysis has been weighted using svy command in Stata software version 14. Only 4 participants aged 10–14 years reported having ever had sex.

Results

Sample characteristics

About half of the sample came from Wakiso district and half came from Kampala district, 40% were male, 42% were currently attending school, and nearly all had some level of education. Most participants (84%) had never been married, and about half ever had sex (Table 1). All participants stated that they had heard about HIV.

Factor structures and construct validity of the GEM scale across age groups and sex

EFA among 10- to 14-year-olds (n = 297) suggested that one principal component (one factor) should be extracted. Next, eight items had factor loadings of less than .3 and were removed. The 16 remaining items represent four content domains: violence, reproductive health and disease prevention, sexuality, and domestic chores and daily life (Table 2). CFA confirmed the one-factor structure model and showed that all factor loadings for the final 16 items were above .3 and significant. The model fit indices were good, and as follows: RMSEA = .044; CFI = .92, TLI = .90. The internal consistency of the scale was alpha = .74 and ordinal theta = .84.

Table 2
Confirmatory factor analysis stratified by age (10–14 vs. 15–24 years old)

GEM scale items		Factor loadings	
		10–14 (n = 297)	15–24 (n = 663)
Q1	There are times a woman deserves to be beaten.	**.31**[a]	.20
Q2	A woman should tolerate violence in order to keep her family together.	**.48**[a]	**.39**[a]
Q3	If someone insults a man he should defend his reputation with force if he has to.	.24	.28
Q4	It is okay for a man to hit his wife if she will not have sex with him.	**.33**[a]	.23
Q5	A man using violence against his wife is a private matter that should not be discussed outside the couple.	.16	.20
Q6	It is alright for a man to beat his wife if she is unfaithful.	.29	**.43**[a]
Q7	It is a woman's responsibility to avoid getting pregnant.	**.44**[a]	.23
Q8	A man should be angered/shocked if his wife asks him to use a condom.	−.16	.23
Q09	Women who carry condoms on them are easy.	**.47**[a]	**.36**[a]
Q10	Only when a woman has a child is she a real woman.	**.42**[a]	**.52**[a]
Q11	A real man produces a male child.	**.43**[a]	**.51**[a]
Q12	It disgusts me when I see a man acting like a woman.	−.12	−.06
Q13	A woman should not initiate sex.	.17	.27
Q14	You do not talk about sex, you just do it.	**.32**[a]	.28
Q15	A woman who has sex before she marries does not deserve respect.	.04	**.38**[a]
Q16	Men need sex more than women do.	**.39**[a]	**.34**[a]
Q17	Men are always ready to have sex.	**.52**[a]	**.40**[a]
Q18	A man needs other women, even if things with his wife are fine.	.19	.21
Q19	It is the man who decides how he wants to have sex.	**.39**[a]	**.36**[a]
Q20	Giving the kids a bath and feeding the kids are the mother's responsibility.	**.31**[a]	**.46**[a]
Q21	A woman's most important role is to take care of her home and cook for her family.	**.34**[a]	**.49**[a]
Q22	A man should have the final word on decisions in his home.	**52**[a]	**.54**[a]
Q23	The husband should decide what major household items to buy.	**.47**[a]	**.57**[a]
Q24	A woman should obey her husband in all things.	**.39**[a]	**.54**[a]
Fit indices from CFA; one latent factor			
Chi-square		140.23 ($p < .01$)	117.8 ($p < .01$)
RMSEA		.039	.031
CFI		.93	.97
TLI		.92	.96
Internal consistency of retained items			
Number of items retained		16	14
Cronbach's alpha		.76	.78
Ordinal theta		.85	.87

Bold values indicate retained items.
CFI = Comparative Fit Index; RMSEA = Root Mean Square Error Approximation; TLI = Tucker-Lewis.
[a] Retained items (16 items retained among 10–14; 14 items retained among 15–24 years old). Six dropped items are: Q3, Q5, Q8, Q12, Q13, and Q18.

EFA among 15- to 24-year-old participants (n = 663) also suggested one principal component (one factor). Ten items were dropped from the original 24-item scale. The 14 remaining items represent all the same four content domains (Table 2). CFA confirmed the one-factor structure model and showed that all factor loadings for the 14 retained items were above .3 and significant. The model fit indices were excellent, and as follows: RMSEA = .0031; CFI = .97, TLI = .96. The internal consistency of the scale was alpha = .78 and ordinal theta = .87.

To confirm the scale performance across males and females, we performed CFA with the multigroup invariance (MI) option, using the whole sample. Findings indicate that factor structures, factor loadings, and fit indices of the scale are comparable across the two gender groups. Likewise, MI analysis was conducted to compare scale performance between 10- to 14-year-olds and 15- to 24-year-olds. Findings from this analysis corroborate those from the two separate CFAs: factor loadings on some items differed between the two groups.

Of the dropped items from two separate CFAs analysis for the 10–14 and 15–24 age groups, six of the same items were dropped among both groups. To permit comparison of scale scores across both age groups (which requires the same list of items), we dropped these six items, to create an 18-item scale. We conducted additional CFA analysis using the whole sample and findings confirmed that this revised, 18-item scale is valid.

Views toward gender norms

Levels of support for inequitable gender norms are presented in Table 3. Overall, respondents reported substantial support for inequitable gender norms. For example, about 70% of the sample agreed that "a woman should tolerate violence to keep her family together," and about 40% agreed that "it is alright for a man to beat his wife if she is unfaithful." Over 65% agreed that it is a woman's responsibility to avoid pregnancy, and more than half agreed that "women who carry condoms on them are 'easy'." About 60% agreed that "men are always ready to have sex," or "men need more sex than women do."

When comparing the two age groups, the younger respondents showed significantly higher levels of support for inequitable gender norms in 14 statements (of the 18 statements in the adapted GEM Scale). For example, 86% of those aged 10–14 years agreed that "giving the kids a bath and feeding the kids are the mother's responsibility;" compared with 78% of 15- to 24-year-olds. Similarly, 89% of younger participants, versus 74% of older participants, agreed that "a man should have the final word on decisions in his home." When combined into a summed GEM Scale, the mean score again supports these observations: younger respondents showed significantly lower levels of support for equitable gender norms (6.4 vs. 7.9; $p < .0001$).

Table 3
Levels of inequitable gender norms stratified by age and gender (18 items)

Statements (items)		Inequitable gender norms among, 10–14 years old (% agreed)			Inequitable gender norms among 15–24 years old (% agreed)		
		Male	Female	Total	Male	Female	Total
Q01	There are times a woman deserves to be beaten.	30.2	31.6	30.9	29.9	21.0	24.3
Q02	A woman should tolerate violence in order to keep her family together.	69.8	77.9	74.1	64.3	69.2	67.4
Q04	It is ok for a man to hit his wife if she will not have sex with him. c*	13.3	11.1	12.1	10.7	5.3	7.3
Q06	It is alright for a man to beat his wife if she is unfaithful. c*	41.9	48.3	45.3	31.7	37.8	35.6
Q07	It is a woman's responsibility to avoid getting pregnant. b**, c*	56.0	68.4	62.5	60.3	77.0	70.1
Q09	Women who carry condoms on them are easy.	51.7	50.5	51.1	56.5	52.9	54.2
Q10	Only when a woman has a child is she a real woman. c*	71.7	74.3	73.1	53.5	56.8	55.6
Q11	A real man produces a male child. c***	68.6	57.0	62.5	40.3	42.0	41.4
Q14	You do not talk about sex, you just do it. c***	52.4	53.8	53.1	36.2	34.9	35.4
Q15	A woman who has sex before she marries does not deserve respect. c***	75.3	77.4	76.4	50.1	55.5	53.5
Q16	Men need sex more than women do. b***	74.6	69.9	72.2	62.2	80.8	74.0
Q17	Men are always ready to have sex.	65.7	60.0	62.7	60.0	64.4	62.8
Q19	It is the man who decides how he wants to have sex. c***	71.7	71.1	71.4	53.0	46.1	48.7
Q20	Giving the kids a bath and feeding the kids are the mother's responsibility. c**	80.0	91.7	86.2	70.2	82.4	77.9
Q21	A woman's most important role is to take care of her home and cook for her family.	91.2	96.3	93.9	86.5	91.5	89.6
Q22	A man should have the final word on decisions in his home. c***	87.1	91.5	89.4	72.7	74.3	73.7
Q23	The husband should decide what major household items to buy. c**	74.2	80.5	77.5	60.4	56.9	58.2
Q24	A woman should obey her husband in all things. c**	92.5	94.2	93.4	83.3	80.2	81.3
Mean of summarized scores of 18 items; lower scores indicate lower support for equitable gender norm c***		6.32	5.94	6.12	8.16	7.71	7.87

Clustering effects and survey weights were adjusted for in all analysis.
*sig at $p < .05$; **sig at $p < .01$; ***sig at $p < .001$.
Comparing male versus female aged 10–14 years: neither individual items nor summarized scores were significant.
b = comparing male versus female aged 15–24 years: two individual items were significant; summarized scores were not significant.
c = comparing 10–14 versus 15–24 years old: 12 individual items were significant; summarized scores were significant.

Given that this was the first application of the GEM Scale with 10- to 14-year-olds and that there can be substantial developmental shifts within the 10- to 14-year range, we also examined 10- to 12-year-olds separately from 13- to 14-year-olds. Responses were similar and there were no significant differences between GEM Scale scores. In addition, females and males reported similar responses, and when combined into the GEM Scale, the mean scores were not significantly different. This result was found among the sample as a whole, as well as when separated into 10- to 14-year-olds and 15- to 24-year-olds. Similarly, there were no significant differences in the mean of GEM Scale scores between married and unmarried respondents nor between those living in urban versus rural locations.

Associations between views toward gender norms and health outcomes

Less equitable responses (i.e., a lower GEM Scale score) were associated with several negative health outcomes (Table 4). For example, participants who had experienced sexual or physical violence were less likely to support equitable gender norms, scoring an average of 7.4 compared with 8.1 among those who had not experienced such violence ($p = .03$). Likewise, those who had experienced early sexual debut had significantly lower support for equitable gender norms, compared with those with later sexual debut (6.1 vs. 8.3, $p < .001$). Those who had used a condom at last sex also had higher GEM Scale scores than those who had not, but this difference was not statistically significant (8.0 vs. 7.5, $p = .27$).

Discussion

The global development community has long articulated the importance of addressing the broad social and health needs of youth. The negative effects of inequitable gender norms on young people has been an important part of this discussion. Findings from this study provide evidence that very young people—in this case, early adolescents through young adults in Uganda—express high support for inequitable gender norms. These norms covered a range of issues related to sexual health

Table 4
Associations between equitable gender norms and HIV-related risk factors (bivariate analysis; N = 663)

	GEM Scale score (std. error)	*p* value
Had sex before the age of 15		<.001
No	8.25 (.19)	
Yes	6.05 (.45)	
Used a condom at last sex (N = 462)		.27
No	7.46 (.28)	
Yes	8.02 (.35)	
Experience with physical or sexual violence		.03
No	8.13 (.19)	
Yes	7.35 (.31)	

The analysis was limited to the subsample of participants aged 15–24 years (N = 663).
Analysis of condom use variable was further restricted to those who were sexually active (N = 462).
Clustering effects and survey weights were adjusted for in all analysis.
GEM Scale summarized scores were calculated for 18 final items; higher scores indicate higher support for equitable gender norms.

and disease prevention, violence, and domestic life, and were statistically associated with health-related behaviors, including early sexual debut and partner violence. The findings also reaffirm other literature indicating that efforts to tackle gender inequity—and negative consequences thereof—must shift societal acceptance of inequitable gender norms [1,13,14].

This study also sheds new light on how early adolescents in Uganda (aged 10–14) view gender norms. Not only did they report support for inequitable gender norms, this support was substantially (and statistically) greater than that of their older counterparts. And that when separating 10- to 14-year-olds into 10- to 12-year-old and 13- to 14-year-old subgroups, no statistically significant differences were found. Our research empirically demonstrates that these younger adolescents have already internalized inequitable social expectations about how men and women should behave.

There are several implications that can be derived from these findings, including programmatic ones. While there is a growing body of "gender-transformative" interventions being implemented to address negative social and health outcomes, such as HIV and violence [25], they rarely reach 10- to 14-year-olds. These findings suggest that it is critical that programs and policies more consistently include 10- to 14-year-olds when promoting equitable gender norms, including the rights, responsibilities, and roles of men and women in society. And given this age range is a transitional one between childhood and older adolescence—with a variety of physical, biological, and social changes—such programs and policies should also take into account the specific needs of this age group. Another implication is that young people may become somewhat more gender equitable over time. This is perhaps due to 10- to 14-year-olds taking societal messages around relationships and gender at face value, given developmental stage and a lack of personal experience. And, as young people grow older, and they increasingly have experience with intimate and sexual partnerships, this perhaps leads to some flexibility in their views (as the reality does not always match the societal messages). This is a topic that would benefit from additional inquiry and research. In addition, further research is needed to understand the implications of these findings for youth who do not conform to these norms, particularly those whose sexual identities or behaviors are not heteronormative.

Other findings highlight the similarities between how young women and young men see gender norms. In general, both supported a wide range of inequitable norms, stressing the fact that norms are created and reinforced across societies and that both men and women contribute to this. Interventions hoping to shift gender norms should always be aware of this and work with both males and females. And findings were also similar between married and unmarried youth, and between urban and rural youth, indicating that these views are quite widespread.

An important goal of this research was to explore whether the GEM Scale could work with 10- to 14-year-olds. Building on over a decade of use among older adolescents and adults, this study is the first to apply and demonstrate the scale's utility and validity when applied to youth aged 10 to 14 years. Scale performance was good among this age group, as well as the 15- to 24-year-olds, and across males and females. Given calls in the literature to develop tools to quantitatively assess younger adolescents' views on gender norms [19,20,45–47], our analysis suggests the GEM Scale's potential to meet this need.

The GEM Scale has been adapted in various settings over time, to respond to specific cultural contexts, and different subpopulations [30,31]. Reflecting a "best practice," it is recommended that the GEM Scale be tested in each new setting, to confirm if any items are not clear/do not work well, and that the scale is internally consistent (through, e.g., the ordinal theta) [48]. Our results confirmed that the scale performed well for both the older and younger age groups. However, when assessing fit separately by age group, several items were dropped from the original 24-item GEM Scale, and the items retained for each group differed somewhat. It is recommended that when conducting research (or evaluations) with a specific subpopulation only, it is best to use the list of items that fits best for that subpopulation. In this case, as an important goal was to compare responses across age groups, a blended, 18-item adaptation of the scale was created, which was confirmed to work well across the whole sample.

Our study adds to previous literature that shows high levels of support for inequitable gender norms among young people aged 15–24 years and that support for inequitable norms is associated with important health indicators such as partner violence and age of sexual debut. And, it is the first to shed light on how early adolescents (aged 10–14 years) also hold inequitable views (as measured by the GEM Scale). Findings demonstrate that views of this younger age group were actually more inequitable than that of their older counterparts. As early adolescents are often not reached by gender-transformative intervention programs, these findings highlight the need to implement such programs among 10- to 14-year-olds in Uganda (and similar contexts), ultimately preventing associated negative social and health outcomes. Moreover, using rigorous analytical methods, we found that the GEM Scale is a good measure of views toward gender norms for the full age range (10–24 years old), and thus a useful tool for future research and program evaluation.

Acknowledgments

The authors would like to thank all field supervisors and interviewers who contributed to survey data collection. They are especially grateful to all the participants who contributed their time to this study. Special thanks to Douglas Nsibambi for coordinating the data collection.

Funding Sources

This study was funded by the Dutch Ministry of Foreign Affairs (SRHR Fund, Category A, Activity no. 24914) through a subcontract from the International HIV/AIDS Alliance under the Link Up project.

References

[1] Gupta GR. Gender, sexuality, and HIV/AIDS: The what, the why, and the how. Can HIV AIDS Policy Law Rev 2000;5:86–93.
[2] Connell RW. Theorising gender. Sociology 1985;19:260–72.
[3] West C, Zimmerman DH. Doing gender. Gend Soc 1987;1:125–51.
[4] Byrnes JP, Miller DC, Schafer WD. Gender differences in risk taking: A meta-analysis. Psychol Bull 1999;125:367–83.
[5] Verbrugge LM. Gender and health: An update on hypotheses and evidence. J Health Soc Behav 1985;26:156–82.
[6] Varga CA. How gender roles influence sexual and reproductive health among South African adolescents. Stud Fam Plann 2003;34:160–72.
[7] Eggleston E, Jackson J, Hardee K. Sexual attitudes and behavior among young adolescents in Jamaica. Int Fam Plan Perspect 1999;25:78–91.
[8] Go VF, Sethulakshmi CJ, Bentley ME, et al. When HIV-prevention messages and gender norms clash: The impact of domestic violence on women's HIV risk in slums of Chennai, India. AIDS Behav 2003;7:263–72.

[9] Jejeebhoy SJ. Wife-beating in rural India: A husband's right? Evidence from survey data. Econ Polit Wkly 1998;33:855–62.
[10] Hindin MJ. Understanding women's attitudes towards wife beating in Zimbabwe. Bull World Health Organ 2003;81:501–8.
[11] Jewkes RK, Dunkle K, Nduna M, et al. Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: A cohort study. Lancet 2010;376:41–8.
[12] Zablotska IB, Gray RH, Koenig MA, et al. Alcohol use, intimate partner violence, sexual coercion and HIV among women aged 15–24 in Rakai, Uganda. AIDS Behav 2007;13:225–33.
[13] Francisco L, Abramsky T, Kiss L, et al. Violence against women and HIV risk behaviors in Kampala, Uganda: Baseline findings from the SASA! Study. Violence Against Women 2013;19:814–32.
[14] Campbell CA. Male gender roles and sexuality: Implications for women's AIDS risk and prevention. Social Sci &Medicine 1995;41:197–210.
[15] Do M, Fu H. Is women's self-efficacy in negotiating sexual decisionmaking associated with condom use in marital relationships in Vietnam? Stud Fam Plann 2011;42:273–82.
[16] Pulerwitz J, Amaro H, Jong WD, et al. Relationship power, condom use and HIV risk among women in the USA. AIDS Care 2002;14:789–800.
[17] Worth D. Sexual decision-making and AIDS: Why condom promotion among vulnerable women is likely to fail. Stud Fam Plann 1989;20: 297–307.
[18] Martin CL, Ruble DN, Szkrybalo J. Cognitive theories of early gender development. Psychol Bull 2002;128:903–33.
[19] Blum RW, Astone NM, Decker MR, et al. A conceptual framework for early adolescence: A platform for research. Int J Adolesc Med Health 2014;26: 321–31.
[20] Igras SM, Macieira M, Murphy E, et al. Investing in very young adolescents' sexual and reproductive health. Glob Public Health 2014;9:555–69.
[21] Hill JP, Lynch ME. The intensification of gender-related role expectations during early adolescence. In: Brooks-Gunn J, Petersen AC, eds. Girls at Puberty: Biological and Psychosocial Perspectives. Boston, MA: Springer US; 1983:201–28.
[22] Pleck JH, Sonenstein FL, Ku LC. Masculinity ideology: Its impact on adolescent males' heterosexual relationships. J Soc Issues 1993;49: 11–29.
[23] Holt S, Buckley H, Whelan S. The impact of exposure to domestic violence on children and young people: A review of the literature. Child Abuse Negl 2008;32:797–810.
[24] Palmer L, Cho NK, Igras SM, et al. Advancing promising program and research/evaluation practices for evidence-based programs reaching very young adolescents: A review of the literature. Washington, DC: Institute for Reproductive Health, Georgetown University; 2010.
[25] Dworkin SL, Treves-Kagan S, Lippman SA. Gender-transformative interventions to reduce HIV risks and violence with heterosexually-active men: A review of the global evidence. AIDS Behav 2013;17:2845–63.
[26] Gay J, Hardee K, Croce-Galis M, Hall C. What works to meet the sexual and reproductive health needs of women living with HIV/AIDS. J Int AIDS Soc 2011;18:56.
[27] Pulerwitz J, Barker G. Measuring attitudes toward gender norms among young men in Brazil development and psychometric evaluation of the GEM scale. Men and Masculinities 2008;10:322–38.
[28] Smiler AP, Epstein M. Measuring gender: Options and issues. In: Chrisler JC, McCreary DR, eds. Handbook of Gender Research in Psychology. New York: Springer Science+Business Media, LCC; 2010. pp.133–57.
[29] Verma RK, Pulerwitz J, Mahendra V, et al. Challenging and changing gender attitudes among young men in Mumbai, India. Reprod Health Matters 2006;14:135–43.
[30] Pulerwitz J, Michaelis A, Verma R, et al. Addressing gender dynamics and engaging men in HIV programs: Lessons learned from Horizons research. Public Health Rep 2010;125:282–92.
[31] Barker G, Manuel C, Heilman B, et al. Evolving Men: Initial results from the International men and gender Equality survey (IMAGES). Washington, DC and Rio de Janeiro: International Center for Research on Women and Instituto Promundo; 2011.
[32] Singh AK, Verma R, Barker G. Measuring gender Attitude: Using gender-equitable men scale (GEMS) in various socio-cultural settings. Chanakyapuri, New Delhi: UN Women; 2013.
[33] Pulerwitz J, Hughes L, Mehta M, et al. Changing gender norms and reducing intimate partner violence: Results from a quasi-experimental intervention study with young men in Ethiopia. Am J Public Health 2015;105:132–7.
[34] Pulerwitz J, Hui W, Arney J, et al. Changing gender norms and reducing HIV and violence risk among workers and students in China. J Health Commun 2015;20:869–78.
[35] Ercan I, Kan I. Reliability and validity in the scales. J Uludağ Univ Med Fac 2004;30:211–6.
[36] Noar SM. The role of structural equation modeling in scale development. Struct Equation Model 2003;10:622–47.
[37] Jain A, Nuankaew R, Mongkholwiboolphol N, et al. Community-based interventions that work to reduce HIV stigma and discrimination: Results of an evaluation study in Thailand. J Int AIDS Soc 2013;16(3 Suppl. 2):18711.
[38] Hair JFJ, Anderson RE, Tatham RL, et al. Multivariate data analysis (5th edition). Upper Saddle River, NJ: Prentice Hall; 1998.
[39] Martens MP. The use of structural equation modeling in counseling psychology research. Couns Psychol 2005;33:269–98.
[40] Vandenberg RJ, Lance CE. A review and synthesis of the measurement invariance Literature: suggestions, practices, and recommendations for organizational research. Organizational Res Methods 2000;3:4–70.
[41] Widaman KF. Common factor analysis versus principal component analysis: Differential bias in representing model parameters? Multivariate Behav Res 1993;28:263–311.
[42] Fabrigar LR, Wegener DT, MacCallum RC, et al. Evaluating the use of exploratory factor analysis in psychological research. Psychol Methods 1999;4:272.
[43] Zumbo B, Gadermann A, Zeisser C. Ordinal versions of coefficient alpha and theta for Likert scale. J Mod Appl Stat Methods 2007;6:21–9.
[44] Uganda National Council for Science and Technology (UNCST). National Guidelines for research involving human Subjects as research participants. Kampala, Uganda: UNCST; 2014:19.
[45] Johns Hopkins Bloomberg School of Public Health, World Health Organization. The global early adolescent Study: An exploration of the Evolving Nature of gender and social Relations. Baltimore: Johns Hopkins Bloomberg School of Public Health; 2014.
[46] Kågesten A, Gibbs S, Blum RW, et al. Understanding factors that shape gender attitudes in early adolescence globally: A mixed-methods systematic review. PLoS ONE 2016;11:e0157805.
[47] Idele P, Gillespie A, Porth T, et al. Epidemiology of HIV and AIDS among adolescents: Current status, inequities, and data gaps. J Acquir Immune Defic Syndr 2014;66:S144–53.
[48] DeVellis RF. Scale Development: Theory and applications. Thousand Oaks, California: SAGE; 2012.