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Authors

Dagadu, Nana Apenem
Barker, Kathryn M
Okello, Sam BT
et al.

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BMJ Open Fostering gender equality and reproductive and sexual health among adolescents: results from a quasi-experimental study in Northern Uganda

Nana Apenem Dagadu,¹ Kathryn M Barker ,² Sam B T Okello,³ Brad Kerner,⁴ Callie Simon,¹ Dennis Nabembezi,⁵ Rebecka Inga Lundgren²

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¹Save the Children Federation, USA, Washington, DC, USA

²Center on Gender Equity and Health, University of California San Diego, La Jolla, CA, USA

³Care International Uganda, Kampala, Uganda

⁴Save the Children Federation, USA, Fairfield, CT, USA

⁵NaNa Development Consultants Limited, Kampala, Uganda

Correspondence to

Dr Nana Apenem Dagadu; nhanonhall@gmail.com

ABSTRACT

Objective To assess the impact of the Gender Roles, Equality and Transformations (GREAT) intervention: a narrative-based, resource-light, life-stage tailored intervention package designed to promote gender-equitable attitudes and behaviours, and improve sexual and reproductive health (SRH) and gender-based violence (GBV) outcomes among adolescents and their communities.

Design Repeated cross-sectional evaluation study, using propensity score matching combined with difference-in-difference estimation.

Setting Two postconflict communities in Lira and Amuru districts in Northern Uganda.

Participants Male and female unmarried adolescents (10–14 years, 15–19 years), married adolescents (15–19 years) and adults (over the age of 19 years) were selected using a stratified, two-stage cluster sample of primary and secondary schools and households (baseline: n=2464, endline: n=2449).

Primary outcome measures Inequitable gender attitudes and behaviours; GBV; and SRH knowledge and behaviours.

Results Statistically significant intervention effects were seen across all three outcomes—gender equity, GBV and SRH—among older and newly married adolescents and adults. Among older adolescents, intervention effects include shifts on: inequitable gender attitudes scale score: -4.2 (95% CI -7.1 to -1.4), $p<0.05$; Inequitable household roles scale score: -11.8 (95% CI -15.6 to -7.9), $p<0.05$; Inequitable attitudes towards GBV scale: -1.9 (95% CI -5.0 to -0.2), $p<0.05$; per cent of boys who sexually assaulted a girl in past 3 months: -7.7 (95% CI -13.1 to -2.3), $p<0.05$; inequitable SRH attitudes scale: -10.1 (95% CI -12.9 to -7.3), $p<0.05$. Among married adolescents, intervention effects include shifts on: Inequitable household roles scale score: -6.5 (95% CI -10.8 to -2.2), $p<0.05$; inequitable attitudes towards GBV scale: -4.7 (95% CI -9.8 to -0.3), $p<0.05$; per cent who reacted violently to their partner: -15.7 (95% CI -27.1 to -4.4), $p<0.05$; inequitable SRH attitudes scale: -12.9 (95% CI -17.3 to -8.5), $p<0.05$.

Conclusion The GREAT intervention model demonstrates the promise of a resource-light, life-stage tailored programme that employs culturally appropriate, participatory and narrative-based techniques to advance gender equity and adolescent health. This type of

Strengths and limitations of this study

- This study evaluates the impact of a multicomponent, age-tailored mass media (narrative-based) intervention in postconflict Northern Uganda.
- The study is one of the first of its kind to evaluate the effectiveness of a mass media campaign in a postconflict setting.
- Propensity score matching was used due to high levels of contamination between the control and intervention groups.
- The possibility of information or social desirability bias in self-report of the study's sensitive topics (sexual behaviour, family planning use and gender-based violence) may not be ruled out.
- The study was not designed to assess the independent effects of each component of the multicomponent intervention.

programming contributes towards reductions in GBV and improved adolescent SRH outcomes.

INTRODUCTION

Global evidence indicates that sexual and reproductive health (SRH) is strongly influenced by gendered attitudes, behaviours and norms cultivated within social systems. Equitable or not, these norms intensify during adolescence—a period of rapid physical, emotional, cognitive and social transitions¹—and influence health outcomes.^{2–4} Rather than focusing on their vulnerability to poverty, gender-based violence (GBV) and poor health and social outcomes,⁵ their potential can be maximised by leveraging their strengths and assets. One way to address this is engaging adolescents and communities in multilevel and multicomponent interventions and gender-transformative approaches that centre gender equality and address and challenge power imbalances in safe spaces for reflection and dialogue.^{6 7} Mass media

campaigns, when accompanied by opportunities for dialogue and reflection, have emerged as a promising practice for raising awareness and transforming underlying attitudes and norms as well as changing behaviour related to SRH behaviours.^{8 9} Studies have found that applying a life-course perspective and strengthening social networks lay the groundwork for positive adolescent SRH.^{10–14}

Despite growing investment in gender transformative interventions for adolescents, evidence of their effect is still limited,^{1 15 16} especially at different stages of the adolescent life course. Furthermore, few such programmes have been scaled up and even fewer documented.¹⁵ Fewer still are studies that examine how to engage both adolescents and their communities to address gender dynamics in postconflict settings. One such setting—communities in postconflict Northern Uganda—represents a context with well documented and widespread GBV, disrupted social and human services, eroded cultural traditions, and heightened economic and physical insecurity.^{17–19} Layered onto inequitable gender norms, unhealthy behaviours and sexual and reproductive vulnerabilities, these conditions have been proven especially harmful to adolescent girls.^{20 21}

Gender Roles, Equality and Transformations intervention

To respond to this gap, the Gender Roles, Equality and Transformations (GREAT) community-based programme was piloted in the Northern Ugandan districts of Gulu, Lira and Amuru from August 2012 to September 2014. GREAT aimed to promote gender-equitable attitudes and behaviours among adolescents (aged 10–19) and their communities to reduce GBV and improve SRH. The intervention package was tailored for four life stages: (1) very young adolescents (VYAs), aged 10–14 years old; (2) older adolescents (OAs), aged 15–19 years old; (3) newly married/newly parenting adolescents (NM/NPs) aged 15–19 years old and (4) adults aged 20 years and older.

Over the 2-year period, each life stage cohort was exposed to four intervention components suited to the literacy and contextual environment of Northern

Uganda (see [figure 1](#)). Each component was tailored to the respective life stage. The first component, the Community Action Cycle (CAC), is an iterative six-phase community mobilisation process. It engaged 382 community leaders across parishes (comprising of several villages) to reflect on and better understand how gender inequality, GBV and poor SRH outcomes are linked. Through this process, community leaders in each parish identified priority issues in collaboration with their communities, developed a plan to address those issues, carried out the plan and monitored and evaluated their progress. The second component, a 50-episode serial radio drama set in the fictional town of Oteka ('great' in Luo), was developed using the Transtheoretical Model behaviour change theory²² and the Pathways to Change tool.²³ The drama included four storylines tailored to VYA, OA, NM/NPs and adults to engage, entertain, inform and spark substantive discussion in communities about gender, violence and SRH including family planning. Complementing the radio drama was a toolkit of participatory activities, including storybooks on puberty for VYA boys and girls, as well as a life-sized board game, radio discussion guides, and activity cards tailored to each life stage. This suite of games and activities was designed to improve puberty and SRH knowledge and catalyse reflection, dialogue, and action around gender inequitable attitudes and behaviours, SRH and GBV. These activities with the GREAT toolkit were conducted in existing adolescent clubs and groups (dance groups, savings clubs, etc) in an average of three small groups per village. The decision to roll out GREAT through existing groups was based on the desire to develop a less costly, and therefore more easily scalable, approach. Finally, to meet the increased need for health services, GREAT trained village health teams (VHTs—ie, community health workers) to improve access to and quality of youth-friendly services.

The overall intervention approach was grounded in two theoretical perspectives: (1) understanding that gender identities established early in life set children on a path which shapes their future²⁴ and (2) recognition that gender norms influence health-related behaviours both directly and indirectly, particularly during the transitional period of adolescence when gender norms and identities begin to coalesce.^{1 3} In addition, we applied six key principles to intervention design as informed by a review of existing global adolescent programmes:

1. Use a positive youth development lens to engage adolescents as active change agents, leverage their assets and foster agency.^{5 25}
2. Shift gender attitudes, behaviours and norms by using mass media and participatory narrative approaches to correct misinformation, encourage critical reflection and dialogue, and change expectations for appropriate behaviour.^{8 12 15 16 26}
3. Adopt a gender synchronised approach—engaging both girls and boys, sometimes apart, sometimes together.²⁷

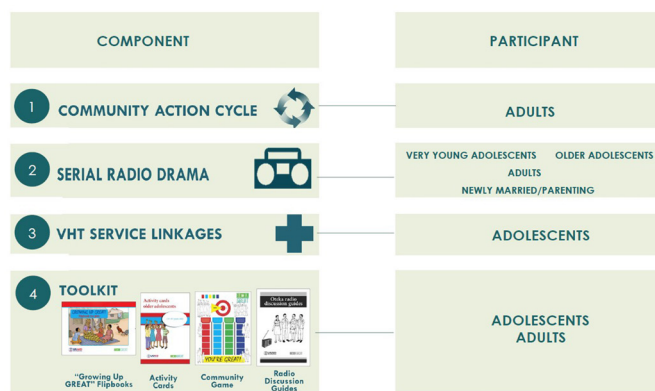


Figure 1 GREAT intervention package and its four components. GREAT, Gender Roles, Equality and Transformations; VHT, village health team.

Table 1 Study participants by life stage at baseline and endline

Life stage	Age (in years)	Description	Baseline sample size (females; males)	Endline sample size (females; males)
Very young adolescents	10–14	Boys and girls; attending school	450 (F: 225; M: 225)	450 (F: 227; M: 223)
Older adolescents	15–19	Boys and girls; unmarried, without children (in and out of school)	1107 (F: 556; M: 551)	1094 (F: 549; M: 545)
Newly married/newly parenting adolescents	15–19	Boys and girls; married/cohabitating with or without children (in and out of school)	506 (F: 304; M: 202)	507 (F: 307; M: 200)
Adults	20+	Men and women; community members	401 (F: 194; M: 207)	398 (F: 216; M: 182)
Total			2464 (F: 1279; M: 1185)	2449 (F: 1299; M: 1150)

- Focus on life course transitions when adolescents learn new roles and norms.²⁸
- Develop multilevel interventions to ensure that new ideas and information diffuse through the social ecology and create an enabling environment for individual change.^{6 28 29}
- Design for scale, using resource-light activities (eg, low cost, minimal staff time) that can be implemented outside a pilot setting via integration within existing community or school groups.³⁰

This paper presents evidence from an outcome evaluation designed to assess whether the GREAT intervention:

- Increased gender-equitable values, attitudes and behaviours among adolescents aged 10–19 and adults.
- Improved SRH knowledge, attitudes and access to services among adolescents 10–19.
- Decreased tolerance of GBV among adolescents and significant others.

We also present findings on intervention effects adult provision of advice and support to young people.

METHODS

Sampling

Baseline (June 2012) and endline (October 2014) cross-sectional surveys were conducted with a total of 4913 participants in the Northern Ugandan districts of Lira and Amuru (detail provided in [table 1](#)). Respondents were selected using a stratified, two-stage cluster sample of primary and secondary schools (VYA) and households (all other life stages) within participating subcounties. Within each subcounty, parishes were selected using probability proportional-to-parish-size (number of villages) sampling. Subsequently, a random sample of two villages was selected from each parish according to probability proportional-to-size (approximate number of households in the villages) and for each selected village, households were selected using simple random sample techniques. Schools for VYAs were sampled randomly and stratified across primary and secondary samples. The same 20 villages in Amuru and 26 villages in Lira and 28 schools (14 in each district) sampled at baseline

were also sampled at endline. The endline sample size was matched to the baseline sample calculated as 2000 adolescents and adults in order to allow for a design effect of 2, 10% non-response rate, 5% non-completion rate and measurement of changes in knowledge, attitudes and behaviour of at least 10%. Additionally, sample sizes of individual life stages were established to allow within group comparisons.

The sampling design also included an intervention and a matched control group. However, due to a high level of exposure in the control villages to the Oteka radio broadcasts (48% coverage), the pre–post trial study design was not possible. As such, we used the cross-sectional baseline and endline data and applied propensity score matching to distribute observed baseline covariates evenly between exposed and unexposed participants.³¹ We obtained effect sizes using difference-in-differences estimates to account for unobserved covariates between the two groups (further information on the statistical approach described below).³²

Exposure to GREAT was defined as ever listening to the Oteka radio programme and/or participating in small group activities using the GREAT Toolkit within the last 6 months. No exposure was defined as no exposure to either the Oteka programme or toolkit activities. Exposure was defined as occasional or frequent (weekly) exposure to either or both Oteka programme and/or toolkit activities. Individuals exposed to information through the radio drama who could not remember specific character names were taken as unexposed to GREAT project interventions.

Patient and public involvement

The intervention approach was guided by a technical advisory group (comprised of representatives from government, civil society and community, and youth leaders) and designed with the goal of eventual scale up and sustainability. The intervention development was also informed through life history ethnographic research with adolescents, their parents and community leaders; extensive in-country programme design; pretesting with adolescents and stakeholders; and routine monitoring efforts

and feedback sessions with adolescents and adults. Local partner organisations and community members were also involved in the pretesting of the baseline and endline study, and participated in dissemination workshops and community meetings following baseline, midline qualitative assessment, and endline surveys.

Instruments

Interview instruments were developed in consultation with GREAT partners and local experts. Questionnaires for OA, NM/NP and adults followed a structured format with Likert-style response options for level of exposure to intervention components and dichotomous responses (yes/no or agree/disagree) for attitudes, group membership, behaviours and topics discussed. The VYA questionnaire was structured in the same way as those for the older age groups, but also included participatory elements, such as quantifiable card sorts, with the aim of engaging children, improving comprehension, reducing courtesy bias, and decreasing potential sensitivity of questions (see Appendix A for instruments).

Measures

The four study outcomes—gender inequity, GBV, SRH and supportive behaviours by adults—were measured using both individual items and composite scales for each life stage. We included behavioural measures and attitudinal precursors to behaviour for each of the four outcomes. Previously-validated gender measures were adapted for use (Mishra *et al*, 2014),³³ including a modified Gender-Equitable Men scale. All scales were calculated as the average of dichotomous items multiplied by 100 (range: 0–100). Individual scale items are described in table 2. Internal consistency of each scale was assessed using Cronbach's alpha for unexposed and exposed endline samples by life stage. Candidate scales with alpha significantly less than 0.6 were not included in analysis. These included the VYA scales on inequitable gender norms scale and inequitable attitudes towards GBV. Cronbach's alphas for scales included in the analyses ranged from 0.54 to 0.88, indicating moderate to good internal consistency (alpha values provided in table 2).³⁴

The four outcomes in the analyses were:

Gender inequity

The gender inequity domain included two behavioural measures for VYAs: helping a sister with chores (for boys) or being helped by a brother (for girls); and talking to parents or guardians about continuing education (for girls) or about a sister continuing education (for boys). For OAs, one behavioural measure was included—talking to parents or guardians about a sister continuing education (for boys)—as well as two scales of behavioural precursors: inequitable gender attitudes and household roles. For NM/NPs the same two behavioural precursor scales were used, as well as two behavioural measures: male involvement in at least two childcare activities in a

typical week; and reports of spousal help with household chores.

Gender-based violence

This domain included one behavioural measure for VYAs: touching (for boys) or having been touched (for girls) on the buttocks or breasts without permission in the past 3 months. OAs were asked this same behavioural measure, as well as two behavioural precursor measures: attitudes towards GBV (scale) and a single item indicating confidence about getting help. For NM/NPs, the inequitable attitudes about GBV scale was used as well as one behavioural measure: violent reaction to a partner, among those who got angry in the past 3 months.

Sexual and reproductive health

Among VYAs, two knowledge items were assessed: recognition that boys and girls experience different rates of body changes in puberty; and ability to identify at least two puberty indicators. For both OAs and NM/NPs behavioural precursor scales were used—inequitable for these life stages included an inequitable SRH attitudes and contraceptive self-efficacy—and two behavioural measures: current family planning use and intended future family planning use.

Supportive behaviours by adults

One behavioural measure from the adult sample was included in this domain to assess adult role-modelling and individual change. A behavioural precursor measure was also included to assess inequitable gender attitudes among adults.

Statistical analysis

Exposed and unexposed endline participants were propensity score matched to baseline participants using a logistic regression model. Propensity scores were calculated using sex, age, education level and religion, district, and employment status and sampling weights. For NM/NPs and adult respondents, the number of biological children and marital status were also included. The propensity scores at endline were generated separately for the exposed and unexposed respondents. Regression models were estimated with cluster robust standard errors at village level to compute marginal outcome estimates for the counterfactuals for the exposed group. The difference in marginal outcome estimates between the counterfactuals and exposed endline group are the effect sizes of exposure to the GREAT interventions. The p-score suite of commands in Stata V.13 was used for these analyses. All analyses were conducted using Stata V.13.

Statistical analyses considered sampling weights, clustering and stratifications. While unweighted descriptive statistics were calculated to summarise the data, sampling survey weights were used for all other analyses. Less than 2% of the data were missing for any given response item and across all the items.

Table 2 Summary of scales, coefficients of reliability (Cronbach's alpha) by life stage and exposure status, and included items

Inequitable gender attitudes scale	VYA	OA	NM/NP	Adult
Sample size by exposure status (unexposed; exposed)	U: 149; E: 301	U: 513; E: 594	U: 220; E: 287	U: 177; E: 244
Alpha coefficients	–	U: 0.65; E: 0.61	U: 0.66; E: 0.64	U: 0.64; E: 0.63
1. Giving a bath and feeding kids are the mother's responsibility 2. A woman's role is taking care of her home and family 3. A man should have the final word about decisions in the home 4. A woman should obey her husband in all things 5. Men are always ready to have sex 6. There are times when a woman deserves to be beaten 7. A woman should tolerate violence to keep her family together 8. If someone insults a man, he should defend his reputation with force if he has to 9. Girls who carry condoms are promiscuous 10. It is solely a woman's responsibility to avoid getting pregnant 11. Men should be offended (outraged) if their wives ask them to use a condom				
Inequitable household roles sharing scale	VYA	OA	NM/NP	Adult
Alpha coefficients	–	U: 0.59; 0.61	U: 0.75; E: 0.70	U: 0.74; E: 0.66
1. A woman's role is taking care of her home and family 2. A man should have the final word about decisions in the home 3. Giving a bath and feeding kids are the mother's responsibility 4. It disgusts me when I see a man acting like a woman (not asked of adults) 5. A woman should obey her husband in all things 6. It is more important for boys to get an education than girls (not asked of older adolescents) 7. If there is a limited money to pay for school fees, it should be spent on sons first (not asked of older adolescents) 8. Boys should have more free time than girls (not asked of older adolescents)				
Inequitable attitudes towards GBV scale	VYA	OA	NM/NP	Adult
Alpha coefficients	–	U: 0.62; E: 0.60	U: 0.62; E: 0.54	U: 0.60; E: 0.59
1. If someone insults a man, he should defend his reputation with force if he has to 2. There are times when a woman deserves to be beaten 3. A woman should tolerate violence to keep her family together 4. A man using violence against his wife is a private matter that shouldn't be discussed outside the couple 5. Physically beating your children is a good way to make them behave 6. I believe it is important to use non-violent ways of disciplining youth, instead of physical violence				
Inequitable attitudes about SRH scale	VYA	OA	NM/NP	Adult
Alpha coefficients	–	U: 0.71; E: 0.67	U: 0.69; E: 0.62	–
1. Men should be offended (outraged) if their wives ask them to use a condom 2. Men are always ready to have sex 3. Girls who carry condoms are promiscuous 4. Only when a woman gives birth to a child is she a real woman 5. Only when a man has a child will he be a respected member of his clan 6. An ideal married couple will produce a child in the first year of marriage 7. A man and a woman should decide together what type of contraceptives to use				

GBV, gender-based violence; NM/NP, newly married/newly parenting adolescent; OA, older adolescent; SRH, sexual and reproductive health; VYA, very young adolescent.

RESULTS

Background characteristics

Across all life stages, most respondents were Catholic, and predominantly ethnic Acholi in Amuru district and ethnic Lango in Lira district (table 3). Primary education was high across cohorts (64% of adults and 80% of VYAs), and most participants indicated that their highest level of education was primary school (85% of OAs, 76% of NM/NPs and 59% of adults). The majority of adults were married (79%) and 44% were employed.

Exposure to the intervention and diffusion

As shown in table 4, exposure to the intervention components varied by life stage. Overall, however, 61% of all

respondents reported being exposed to the Oteka radio programme. Exposure to the toolkit was much lower (about 7% overall), although 21% of VYAs reported using the toolkit through school-based implementation. VHT and CAC exposures were also low at 6% and 14%, respectively.

Intervention effect on gender inequity

Overall, the results show several significant improvements in behaviours and behavioural precursors (ie, knowledge and attitudes) related to gender inequity (table 5). Of the nine life stage measures in this domain, seven exhibited significant shifts towards greater gender equity. Among VYAs, there was a significant increase in brothers

Table 3 Background characteristics of endline survey respondents

Characteristic	Very young adolescents (n=450)	Older adolescents (n=1094)	Newly married/newly parenting (n=506)	Adults (n=398)
Age, median	13.5	16	18	31
Sex, %				
Male	49.6	49.8	39.4	45.7
Female	50.4	50.2	60.6	53.0
Religion, %				
Catholic	56.5	63.5	68.6	59.1
Pentecostal	14.3	10.6	*	12.1
Protestant	24.8	25.2	22.3	27
Other	4.5	0.8	9.15	2
Tribe, %				
Aholi	46.7	50.3	49.8	47.9
Lango	50.9	49.4	49.4	51.7
Other	2.5	0.4	0.8	0.5
Education level†, %				
Primary 4/5	41.6			
Primary 6/7	21.3			
Senior 1/2	17.1			
None		3.0	9.35	22.3
Primary		85.4	75.8	58.6
Secondary		15.3	14.9	19.1
Currently schooling		58.4		
Marital status, %				
Cohabiting			44.8	
Married			38.7	
Single parents			16.6	
Married/cohabiting				78.8
Never married				8.9
Separated				12.3
In romantic relationship, %		24.5	79.2	
Employed, %		19.2	34.4	44.5
Have at least one child, %			71.6	
No of children, mean				4.0
Currently living with brother/sister, %	81.6	76		
Self/partner currently pregnant, %			27.1	
Has a trusted adult to talk to, %	58.9	83.5	86.9	

*Cells with no data indicate response option or question not asked.

†Unless stated otherwise education level refers to the highest level of education attained, whether or not the level was completed.

helping sisters with chores, with 84% of exposed VYAs reporting this compared with an estimated 62% in the counterfactual group ($p < 0.05$). Among OAs, there were

significant reductions in mean scores on the inequitable gender attitudes and household roles scales. Exposed OA boys were also significantly more likely to report discussing

Table 4 Exposure to great intervention components among all endline participants by life stage

Life stage	Exposure (%)			
	Radio	Toolkit	CAC	VHT
Very young adolescents	68.1	21.4	5.8	10.7
Older adolescents	58.9	3.3	4.8	9.3
Newly married/newly parenting	58.3	4.9	6.8	22.1
Adults	61.9	1.8	9.8	25.2
Total	61.1	6.5	6.2	14.6

CAC, Community Action Cycle; VHT, village health team.

sisters' education with parents (72%) than among the estimated counterfactual group (56%) ($p < 0.05$). The two remaining measures were not statistically significant, but trended towards increased gender equality. For example, exposed VYAs reported more discussions with parents about sisters' education (69%) than estimated had they not been exposed (52%).

Gender-based violence

Marked reductions were observed in some key behaviours and behavioural precursors of GBV for the older life stage but not for VYAs (table 6). Among VYAs, there

were no significant intervention effects on girls' and boys' reports of experiencing and perpetrating recent unwanted touching. Among both OAs and NM/NPs, there were significant intervention effects reducing inequitable attitudes towards GBV, and among OAs there was a significant positive intervention effect on confidence in seeking help for unwanted touching. For OAs, effects on behaviours were mixed by gender. Among OA boys exposed to the intervention, only 4% reported perpetrating unwanted touching, compared with an estimated 12% had they not been exposed ($p < 0.05$), while among

Table 5 Intervention effects on gender inequity by life stage

Outcome	N exposed	Overall % or mean		Intervention effect
		Obs.	CF	
Very young adolescents†				
% helped sister with chores/was helped by brother	256	83.5	62.4	21.1 (4.1, 44.7)*
% discussed with parents/guardians about continuing with education/ sister continuing her education	256	68.8	52.4	17.1 (-2.9, 35.7)
Older Adolescents‡				
Inequitable gender attitudes scale§ (mean)	553	49.8	54.0	-4.2 (-7.1, -1.4)*
Inequitable household roles (mean)	553	49.6	63.1	-11.8 (-15.6, -7.9)*
% boys who ever talked to their parents or another adult about the importance of sisters continuing with studies	334	72.2	56.0	16.2 (6.2, 26.2)*
Newly married/newly parenting‡				
Inequitable gender attitudes scale (mean)	224	55.9	59.6	-3.7 (-7.7, 0.3)
Inequitable household roles scale (mean)	224	62.6	69.1	-6.5 (-10.8, -2.2)*
% men involved in at least two childcare activities in a typical week	224	51.8	41.5	10.3 (0.9, 19.7)*
% that was helped by spouse with household chores	224	65.4	53.4	11.9 (2.3, 21.5)*

* $P < 0.05$

†Effects adjusted/matched on age, person staying with, presence of sibling of opposite sex in household, education level, current schooling status, religion and district.

‡Effects adjusted/matched on age, marital status, education level, sex, religious affiliation, had biological children or not, employment status and district.

§This scale and all other scales were calculated from 0 to 100 as the average of dichotomous items multiplied by 100.

CF, counterfactual or expected outcome in absence of exposure; Obs, observed outcomes among the exposed.

Table 6 Intervention effects on gender-based violence by life stage

Outcome	N exposed	Overall % or mean		Intervention effect
		Obs.	CF	
Very young adolescents†				
% of girls whom boys touched on their buttocks or breasts without their permission in past 3 months	137	8.4	14.1	-5.7 (-16.0, 3.5)
% of boys who touched a girl on her buttocks or breasts without permission in past 3 months	172	6.8	7.2	0.4 (-19.3, 11.3)
Older adolescents‡				
Inequitable attitudes towards GBV scale§	553	23.6	25.5	-1.9 (-5.0,-0.2)*
% who are confident that they would get help if they are being touched in ways that make them feel uncomfortable	553	91.2	82.7	8.5 (3.2, 13.8)*
% of girls whom boys touched on their buttocks or breasts without their permission in past 3 months	219	16.7	18.5	-1.8 (-7.4, 3.8)
% of boys who touched a girl on her buttocks or breasts without permission in past 3 months	334	4.3	12.0	-7.7 (-13.1,-2.3)*
Newly married/newly parenting‡				
Inequitable attitudes towards GBV scale	224	23.6	28.3	-4.7 (-9.8,-0.3)*
% who reacted violently to the partner	224	5.3	21.0	-15.7 (-27.1,-4.4)*

*P<0.05

†Effects adjusted/matched on age, person staying with, presence of sibling of opposite sex in household, education level, current schooling status, religion and district.

‡Effects adjusted/matched on age, marital status, education level, sex, religious affiliation, had biological children or not, employment status and district.

§This scale and all other scales were calculated from 0 to 100 as the average of dichotomous items multiplied by 100.

CF, Counterfactual or expected outcome in absence of exposure; GBV, gender-based violence; Obs, Observed outcomes among the exposed.

OA girls there was no significant intervention effect on reports of experiencing unwanted touching. Among male and female NM/NPs living with their partner, there was a significant intervention effect on violent reactions to a partner, declining from 21% estimated among the counterfactual group to 5% among the exposed group (effect size=-15.7%, 95% CI -27.1% to -4.4%).

Sexual and reproductive health

For the final outcome of interest, there were significant improvements in the SRH domain for the older life stages, but not for the VYAs (table 7). There were no significant intervention effects on the two indicators of VYAs' puberty knowledge, although knowledge was high in both the exposed group and the estimated counterfactual. For example, among the exposed group, 89% could identify at least two puberty indicators, compared with an estimate of 86% had they not been exposed. There was a significant intervention effect on reducing inequitable SRH attitudes and increasing contraceptive self-efficacy among both OAs and NM/NPs. Current family planning (FP) use also experienced an increase among sexually active OAs and NM/NPs, though statistically significant only among NM/NPs. Specifically, 41% of exposed

sexually active OAs reported contraceptive use compared with an estimated 31% had they not received the intervention (effect size=10.1, 95% CI=-1.0 to 21.1). Among NM/NPs, 44% reported current FP use among those exposed to the intervention, compared with a 33% counterfactual estimate (effect size=10.4, 95% CI=1.1 to 19.6). OAs and NM/NPs also experienced significant positive intervention effects on intentions to use FP in the future, among those currently not using a method.

Supportive environment via adult role-modelling and individual change

Results for adult participants indicated a significant intervention effect on decreasing inequitable gender attitudes (effect size=-8.0, 95% CI=-12.8 to -3.1) (table 8). The proportion of adults who helped adolescents who wanted to avoid getting pregnant increased by 17% (95% CI 1.8 to 32.3) and the proportion of adults who talked to adolescents about what it means to be a respectful man or woman in the community increased by 23% (95% CI 7.7 to 38.5).

DISCUSSION

The GREAT intervention was developed using hypothesis-driven design, as informed by existing theory, empirical

Table 7 Intervention effects on sexual and reproductive health (SRH) attitudes and behaviours by life stage

Outcome	N exposed	Overall % or mean		Intervention effect
		Obs.	CF	
Very young adolescents†				
% recognise that boys and girls experience different rates of body changes in puberty	309	83.5	74.7	-11.2 (-39.4, 0.1)
% able to identify at least two puberty indicators	309	89.3	86.1	3.2 (-4.2, 14.0)
Older adolescents‡				
Inequitable SRH attitudes scale§	553	40.6	50.7	-10.1 (-12.9,-7.3)*
Contraceptive self-efficacy	553	48.4	37.8	10.6 (5.8, 15.4)*
% Currently practising FP (among sexually active)	251	40.8	30.7	10.1 (-1.0, 21.1)
% who intend to use an FP method in future (among all OAs)	553	70.0	54.2	15.8 (9.5, 22.2)*
Newly married/newly parenting‡				
Inequitable SRH attitudes scale	224	37.8	50.7	-12.9 (-17.3,-8.5)*
Contraceptive self-efficacy	224	67.5	59.2	8.3 (4.2, 12.4)*
% currently practising FP	224	43.8	33.4	10.4 (1.1, 19.6)*
% who intend to use a FP method in future	224	85.0	75.0	10.4 (2.3, 18.5)*

*P<0.05

†Effects adjusted/matched on age, person staying with, presence of sibling of opposite sex in household, education level, current schooling status, religion and district.

‡Effects adjusted/matched on age, marital status, education level, sex, religious affiliation, had biological children or not, employment status and district.

§This scale and all other scales were calculated from 0 to 100 as the average of dichotomous items multiplied by 100.

CF, counterfactual or expected outcome in absence of exposure; FP, family planning; OAs, older adolescents; Obs, observed outcomes among the exposed.

work, global adolescent programming and formative ethnographic research. It was hypothesised that life stage-tailored and gender-synchronised delivery of narrative-based programme components (ie, radio drama, puberty story books and story-based activity cards) would achieve desired outcomes. Findings suggest that the five scales—gender equitable attitudes, household roles, inequitable attitudes towards GBV, SRH norms, and contraceptive self-efficacy—were internally consistent across all

domains. Furthermore, these scales appeared to tap into constructs positively impacted by GREAT, with statistically significant improvements shown across all five domains for NM/NPs and in three domains for OAs. For example, both OAs and NM/NPs in the intervention were less likely to hold inequitable gender attitudes as compared with the counterfactual unexposed groups (mean: -4.2 points and -3.7 points lower on the scale scores which ranged from 0 to 100 ($p<0.05$)). Results also indicate that

Table 8 Enabling environment for gender equitable attitudes and practices (adult respondents)

Outcome	N exposed	Overall % or mean		Intervention effect
		Obs.	CF	
Inequitable gender attitudes scale‡ (mean) [†]	183	54.0	62.0	-8.0 (-12.8, -3.1)*
Helped a young person who wanted to avoid getting pregnant [†]	183	41.6	53.4	17.0 (1.8, 32.3)*
Spoke to a young person about what I means to be a respectful man or woman in the culture [†]	183	52.4	69.3	23.1 (7.7, 38.5)*

*Significant at $p<0.05$.

†Effects adjusted/matched on age, marital status, education level, sex, religious affiliation, had biological children or not, employment status and district.

‡This scale and all other scales were calculated from 0 to 100 as the average of dichotomous items multiplied by 100.

Obs, Observed outcomes among the exposed; CF, Counterfactual or expected outcome in absence of exposure.

GREAT contributed to reductions in rates of GBV and improvements in SRH outcomes, particularly for OAs and NM/NPs. For example, the proportion of those self-reporting they reacted violently towards a sexual partner was 16 percentage points lower among NM/NPs in GREAT as compared with the counterfactual unexposed group (5.3% vs 21%, a difference of 15.7% (95% CI 4.4 to 27.1, $p < 0.05$). Findings from the adult sample indicate significant intervention effects on decreasing inequitable gender attitudes, increased willingness to help adolescents who want to avoid getting pregnant, and an increased proportion of adults who talked to adolescents about what it means to be a respectful man or woman in the community.

The intervention effects seen are particularly notable given that the GREAT approach is relatively resource light, consisting of weekly radio drama sessions, community mobilisation efforts conducted at the parish (rather than village) level and adolescent engagement through existing community groups using a participatory toolkit. Findings suggest that listening to the Oteka radio drama was the main way respondents were exposed to GREAT, and therefore, the primary driver of the changes identified by the evaluation. This is consistent with high radio listenership in northern Uganda. Only a small percentage of respondents, outside of VYAs, reported participating in the small group based activities using the GREAT Toolkit. This may be either because respondents were unable to identify exposure to other GREAT intervention elements when asked in the survey or too few individuals were actually exposed because the intervention used existing adolescent groups and clubs to enhance scalability, rather than forming new ones.

Limitations

An accurate assessment of the effectiveness of GREAT is based on the challenging task of measuring changes in complex social constructs (eg, gender inequity) in eight distinct subgroups (male/female early adolescents, OA, NM/NPs and adults). Although psychometric testing of the measures at endline yielded reliable scales for OA, NM/NPs and adults, the VYA scales did not achieve adequate internal consistency. Some measures, especially the measures for VYAs, would have benefitted from additional piloting and refinement prior to the baseline, had time permitted. The results also rely on self-report of sexual behaviour, family planning use and GBV, which may be biased due to social desirability or recall. In addition, little change was observed among VYAs in study outcomes due to several potential reasons. First, this may be due to the fact that attitudes and knowledge were high at baseline, and therefore, a significant change was more difficult to achieve. Second, only a few behavioural measures for this age group were included in the survey, and thus it may have been that the inclusion of additional behavioural measures would have captured change. Finally, it may also have been due to weaknesses in the intervention itself. For example, it may have been

that the intervention did not have the correct content or approach for VYA participants.

As with many community-based interventions in rural areas, intervention coverage was one of the most complex and challenging issues confronting GREAT implementation. First, there was high exposure to the radio broadcasts in both control and experimental villages. Although we overcame this issue through the use of propensity score matching, we were unable to assess intervention effectiveness through our original quasi-experimental pre-post study design. Second, the intervention occurred within parishes that had received other radio programmes in the past. In order to isolate effects of GREAT's Oteka radio show, we chose to code individuals who could not remember specific character names in Oteka as unexposed to GREAT. It is possible that the effects of GREAT would be larger if we had taken a less conservative approach in our exposure criteria. While the intervention components were extensively pre-tested and revised, the intervention would have benefited from a proof of concept (pilot) phase to assess the package in routine implementation circumstances. Future research and pilot studies would benefit from additional investment such as this, which would likely yield benefits in terms of ease of implementation, improved coverage and package adjustments based on better understanding of change mechanisms.

Finally, this study was not designed to assess the independent effects of each component. Given the theoretical importance of understanding the value of single-component vs multicomponent interventions,⁶ future research investments to assess these independent vs combined intervention component effects is necessary. Another priority is to improve approaches to assess dosage and exposure to generate evidence on how much intervention is sufficient to reach a tipping point of behaviour change, a research question prioritised by Haberland *et al.* Future research on gender transformative approaches with early adolescents should also apply longitudinal methods to assess programmatic impacts over time. Although it is unknown whether changes in this study have been sustained, evaluation results using a longitudinal cohort with 10–14 years boys and girls in Kinshasa who participated in an adaptation of GREAT reveal not only that some of the initial intervention effects were sustained 3 years postintervention, but also that new positive SRH results were observed within the cohort of VYAs.³⁵

Implications

At the time of this study, northern Uganda was in the process of transitioning to a postconflict state and the majority of its inhabitants had left camps for internally displaced persons and had returned to their ancestral homes (land belonging to their lineage). Families were struggling to regain their economic capacity and revitalise cultural values and traditions. In order to help young people overcome these challenges, community leaders

were working to revitalise cultural traditions in ways that supported more equitable, peaceful relationships that would lead to healthier communities. Perhaps because of this context, communities may have been more open to interventions that address violence. To our knowledge, GREAT is the only programme that simultaneously engages VYAs, OAs and first-time parents using life-stage tailored content on GBV and SRH. This is despite widespread acknowledgement of the need for multicomponent, life-stage tailored, and gender transformative programming approaches, and little evidence available on their effectiveness.¹⁶ This article addresses this gap and suggests that shifting gendered attitudes and SRH behaviours among girls and boys across adolescent life stages—even with a relatively resource-light approach—is achievable in this study setting.

Results of this study confirm that gender norms appear largely static; masculinity and femininity are still embodied by procreation, ideal women are obedient and nurturing, and ideal men are providers with authority over women, a situation that is common across Uganda, including non-conflict settings.³⁶ This participatory, narrative-based intervention is resource-light and should be scaled and tested in other contexts to address broader community-level norm change and SRH and GBV outcomes in culturally appropriate ways. In addition, this intervention targets multiple outcomes simultaneously (gender attitudes, violence, SRH) among boys/men and girls/women at different life course stages. This intersectional approach is increasingly recognised as essential due to the cross-cutting nature of gender across the life cycle. The promising measures highlighted in this paper can also be applied and further refined in other research initiatives to advance available gender and SRH measures. Donors, health researchers and implementers must build on this growing momentum to implement and rigorously test gender transformative approaches to advance gender equity, improve adolescent SRH and achieve sustained change.

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Written informed assent and parental consent (participants under age 18), and consent (participants over age 18) were obtained prior to each interview. Interviews were conducted in a place of convenience—school, home, or community location—for each respondent.

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ORCID iD

Kathryn M Barker <http://orcid.org/0000-0002-6242-0217>

REFERENCES

- Chandra-Mouli V, Plesons M, Adebayo E, *et al*. Implications of the global early adolescent study's formative research findings for action and for research. *J Adolesc Health* 2017;61:S5–9.
- John NA, Stoebenau K, Ritter S. *Gender socialization during adolescence in low- and middle-income countries: conceptualization, influences and outcomes. Innocenti discussion paper*. Florence, Italy: UNICEF Office of Research - Innocenti, 2017.
- 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.
- Petroni S, Fritz K. *Improving the health of women and adolescents: an unfinished agenda*. New York, NY: United Nations Department of Economic and Social Affairs, 2013.
- Catalano RF, Skinner ML, Alvarado G, *et al*. Positive youth development programs in low- and middle-income countries: a conceptual framework and systematic review of efficacy. *J Adolesc Health* 2019;65:15–31.
- Haberland NA, McCarthy KJ, Brady M. A systematic review of adolescent girl program implementation in low- and middle-income countries: evidence gaps and insights. *J Adolesc Health* 2018;63:18–31.
- Kågesten A, Chandra-Mouli V. Gender-transformative programmes: implications for research and action. *Lancet Glob Health* 2020;8:e159–60.
- Sedlander E, Rimal RN. Beyond individual-level theorizing in social norms research: how collective norms and media access affect adolescents' use of contraception. *J Adolesc Health* 2019;64:S31–6.
- USAID. Mass media: reaching audiences far and wide with messages to support healthy reproductive behaviors. *High Impact Practices in Family Planning* 2017.
- Heymann J, Levy JK, Bose B, *et al*. Improving health with programmatic, legal, and policy approaches to reduce gender inequality and change restrictive gender norms. *Lancet* 2019;393:2522–34.
- Lundgren R, Burgess S, Chantelouis H, *et al*. Processing gender: lived experiences of reproducing and transforming gender norms over the life course of young people in northern Uganda. *Cult Health Sex* 2019;21:387–403.
- RG-ANDM M, Page E. *GAGE rigorous review: girls' clubs, life skills programmes and girls' well-being outcomes*. London: Gender and Adolescence: Global Evidence, 2017.
- Sawyer SM, Affi RA, Bearinger LH, *et al*. Adolescence: a foundation for future health. *Lancet* 2012;379:1630–40.
- Viner RM, Ozer EM, Denny S, *et al*. Adolescence and the social determinants of health. *Lancet* 2012;379:1641–52.



- 15 Lane C, Brundage CL, Kreinin T. Why we must invest in early adolescence: early intervention, lasting impact. *J Adolesc Health* 2017;61:S10–11.
- 16 Levy JK, Darmstadt GL, Ashby C, *et al*. Characteristics of successful programmes targeting gender inequality and restrictive gender norms for the health and wellbeing of children, adolescents, and young adults: a systematic review. *Lancet Glob Health* 2020;8:e225–36.
- 17 Bukuluki P, Kisuule JD, Makerere AB, *et al*. Perceptions of the drivers of sexual and gender based violence in post conflict Northern Uganda. *ILSHS* 2013;10:84–102.
- 18 Kinyanda E, Musisi S, Biryabarema C, *et al*. War related sexual violence and it's medical and psychological consequences as seen in Kitgum, Northern Uganda: a cross-sectional study. *BMC Int Health Hum Rights* 2010;10:28.
- 19 Statistics UBo ICF. *Uganda demographic and health survey 2016: key indicators report*. Kampala, Uganda: Uganda Bureau of Statistics, 2018.
- 20 Kibombo R, Neema S, Ahmed FH. Perceptions of risk to HIV infection among adolescents in Uganda: are they related to sexual behaviour? *Afr J Reprod Health* 2007;11:168–81.
- 21 Magadi MA, Agwanda AO, Obare FO. A comparative analysis of the use of maternal health services between teenagers and older mothers in sub-Saharan Africa: evidence from demographic and health surveys (DHS). *Soc Sci Med* 2007;64:1311–25.
- 22 Prochaska JO, Redding CA, Harlow LL, *et al*. The transtheoretical model of change and HIV prevention: a review. *Health Educ Q* 1994;21:471–86.
- 23 Petraglia J, Galavotti C, Harford N, *et al*. Applying behavioral science to behavior change communication: the pathways to change tools. *Health Promot Pract* 2007;8:384–93.
- 24 Blum RW, Mmari K, Moreau C. It begins at 10: how gender expectations shape early adolescence around the world. *J Adolesc Health* 2017;61:S3–4.
- 25 Alvarado G, Skinner M, Plaut D. *A systematic review of positive youth development programs in Low-and middle-income countries*. Washington, DC: YouthPower Learning, Making Cents International, 2017.
- 26 Riley AH, Barker K, Lundgren R. From theory to practice: what global health practitioners need to know about social norms and narrative interventions. *J Commun Healthc* 2021;14:102–4.
- 27 Greene MLA. *Synchronizing gender strategies a cooperative model for improving reproductive health and transforming gender relations*. Interagency Gender Working Group (IGWG), 2010.
- 28 Lundgren R, Gibbs S, Kerner B. Does it take a village? fostering gender equity among early adolescents in Nepal. *Int J Adolesc Med Health* 2018;32. doi:10.1515/ijamh-2017-0164. [Epub ahead of print: 30 Apr 2018].
- 29 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.
- 30 World Health Organization. *Nine steps for developing a scaling-up strategy*. France: World Health Organization, 2010.
- 31 Rosenbaum PR, Rubin DB. The central role of the propensity score in observational studies for causal effects. *Biometrika* 1983;70:41–55.
- 32 Shadish WR, Cook TD, Campbell DT. *Experimental and quasi-experimental designs for generalized causal inference*. Boston New York: Houghton Mifflin Company, 2002.
- 33 Mishra A, Nanda P, Speizer IS, *et al*. Men's attitudes on gender equality and their contraceptive use in Uttar Pradesh India. *Reprod Health* 2014;11:41.
- 34 Nunnally JC. *Psychometric theory*. 2nd ed. New York: McGraw-Hill, 1978.
- 35 Center on Gender Equity and Health. *Growing up great! GEAS wave 4 report*. La Jolla, CA: University of California San Diego, 2021.
- 36 Adams MK, Salazar E, Lundgren R. Tell them you are planning for the future: gender norms and family planning among adolescents in northern Uganda. *Int J Gynaecol Obstet* 2013;123 Suppl 1:e7–10. Nov.