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Changes in family-level attitudes and norms and association with secondary school completion and child marriage among adolescent girls: results from an exploratory study nested within a cluster-randomised controlled trial in India

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Abstract

Background: We evaluated the impact of *Samata*, a 3-year multi-layered intervention among scheduled caste/scheduled tribe (SC/ST) adolescent girls in rural northern Karnataka, on family-level (parents or guardian) attitudes and direct and indirect norms related to child marriage and girl's education.

Method: Endline data from 1840 family members were used to assess the effect of *Samata* on attitudes and norms related to schooling and child marriage, while data from 4097 family members (including 2257 family members at baseline) were used to understand the shifts in attitudes and norms over the period 2014-2017.

Results: Overall, we found the programme had little impact on family-level attitudes and norms. However, there were shifts in some attitudes, norms, and perceived sanctions between baseline (when girls were aged 13-14 years) and endline (when girls were aged 15-16 years), with some becoming more progressive (e.g. direct norms related to child marriage) and others more restrictive (e.g. norms around girls completing secondary education, and norms related to child marriage and educational drop-out (blaming girls for eve teasing, and limiting girls' mobility so as to protect family honour)). Moreover, non-progressive norms related to marriage and education were strongly associated with child marriage and secondary school non-completion among adolescent girls in this rural setting.

Conclusions: Norms hypothesised to be important for marriage and schooling outcomes were indeed associated with these outcomes, but the intervention was not able to significantly shift these norms. In part, this may have been due to the intervention focusing much of its' initial efforts on working with girls alone

rather than family members, the relevant reference group. Future interventions that seek to affect norms should conduct formative research to clarify the specific norms affecting the outcome(s) of interest; likewise, program planners should ensure that all activities engage those most influential in enforcing the norm(s) from the beginning.

Trial registration: ClinicalTrials.gov registration number NCT01996241.

Introduction

Despite significant advancement in global access to and retention in school, adolescents are twice as likely to be out of school than younger children. Global estimates from 2015 suggest that about 63 million adolescents aged 12-15 years are denied their right to education and about 17% of adolescents of secondary school age (18% girls and 16% boys) are out of school (UNESCO Institute for Statistics (UIS) and UNICEF 2015). India has made significant progress towards universalising primary education, but school completion rates at secondary level and beyond remain challenging. Estimates from the UNESCO 2016 report suggest that 47 million Indian secondary- and higher-secondary school age youth have dropped out of school (UNESCO Institute for Statistics (UIS) and Global Education Monitoring Report (GEMR) 2016).

While there have been recent improvements in reducing gender inequality in school retention globally, girls still lag behind in some settings. Evidence suggests that despite strong political commitment and efforts to promote gender equality in schooling, boys still outnumber girls in secondary school completion (CARE USA 2017). This is particularly true of historically disenfranchised populations, such as scheduled caste and scheduled tribe (SC/ST) populations in northern Karnataka – where this study took place (T S. Beattie et al. 2019). Here SC/ST girls have the lowest rates of secondary school enrolment and retention, and the highest rates of child marriage of any group in Karnataka state, highlighting how gender, caste and regional disparities affect educational uptake and child marriage (T S. Beattie et al. 2019). A series of factors, at different levels, influence these outcomes. These include, individual-level factors such as personal attitudes

and knowledge, material constraints such as access to resources, and structural factors such as laws that disadvantage women and girls (Cislaghi and Heise 2018c). Within this interplay of factors, social norms can act as either a "brake" in the process of social change (CARE USA 2017; Heise and Manji 2016) or an accelerator; thus, understanding the role that social norms play in sustaining specific practices is important.

The Karnataka Health Promotion Trust (KHPT), in collaboration with London School of Hygiene and Tropical Medicine (LSHTM), implemented a 3-year multi-layered intervention known as *Samata*, among rural SC/ST adolescent girls in two districts in northern Karnataka. The program's overall aim was to improve girls' secondary school enrolment and completion, and to delay age at marriage. Our underlying hypothesis was that child marriage and secondary school drop-out are linked, and that keeping girls in school would indirectly lead to later marriage. The intervention took place in two demographically similar districts in Karnataka state: Vijayapura and Bagalkote. In both the districts, around three quarters of the population live in rural areas, and 82% of rural SC/ST households live below the poverty line (Office of the Registrar General & Census Commissioner 2011; International Institute for Population Sciences (IIPS) and ICF 2017, http://rchiips.org/nfhs/NFHS-4Reports/India.pdf). Previous research from this setting revealed that concerns around maintaining a girl's 'purity' after menarche are common and are connected with norms of family 'honour' and maintaining "marriageability (Ramanaik et al. 2018; Roest 2016). Related to this, 'eve teasing' of adolescent girls (harassment by men and boys (name calling, whistling, being pelted with small stones)) – or the fear thereof - is commonly described in Indian settings (Roest 2016), and can lead to a family terminating a girl's education and arranging an early marriage. Restrictive norms often limit girls' mobility, education, aspirations, self-esteem, and participation in decision-making on matters that are crucial to their lives and livelihoods (Bhagavatheeswaran et al. 2016; Mallika et al. 2012).

The *Samata* programme worked with adolescent girls and boys, parents and village communities to change norms around girl education and marriage and overcome poverty-related drivers of school drop-out and early marriage. Specifically, it: (i) established safe spaces for girls to meet and develop life skills; (ii)

provided academic tutoring for girls; (iii) engaged boys in a sports-based programme designed to promote gender equality; (iv) sensitised parents to value girls' education and challenge norms around child marriage, and (v) link families to government financial incentives for girls in school. The intervention also worked with schools to introduce attendance tracking and active follow-up of frequent absenteeism/drop-out; introduce school safety policies designed to protect girls from harassment at school; train school staff on issues around gender and female drop-out; and strengthen the school governing committees. The programme was delivered to all SC/ST girls aged 13-16 years in the intervention village clusters, regardless of if they were enrolled in the Trial.

The term "social norms" refers to the unwritten rules of acceptable and appropriate behaviour in a given group or society. While many theories exist of how norms influence behaviour (Legros and Cislaghi 2019), one dominant approach conceptualizes norms as beliefs about; i) what others in one's group do (descriptive norms, e.g. most girls in this community marry before 16), and ii) what others in one's group approve of (injunctive norms, e.g. people disapprove of unmarried 17-year-old girls) (Mackie et al. 2015). Social norms are different from people's individual attitudes, their internal dispositions towards something (e.g. I prefer it when girls are not married until they are 18 years old). People's attitudes can be aligned or misaligned with the norm, resulting in different trajectories for interventions and highlighting the need for accurate measurement (Cislaghi and Heise 2018b). Importantly, non-compliance with a norm can result in social sanctions or believes about the negative effects (e.g. if I don't marry my daughter when she reaches menarche, this may damage the family honour and make it more difficult/expensive to marry her).

Recently, social norms scholars have hypothesised that social norms can have both direct and indirect influences over a practice (Cislaghi and Heise 2018a). They have a direct influence when the norm "you are expected to X" overlaps with the practice "do X". For instance, the norm "you are expected to marry girls soon after they reach menarche" directly influences the practice of "marrying off your daughter soon after menarche". Or, the norm "a son's education should be prioritised over a daughter's" directly may influence the practice of "sending sons to school and not daughters" (among impoverished families that

must prioritise). Conversely, norms have an indirect influence when the norm "you are expected to do Y", influences the practice to "do Z". For instance, the norm "girls should refrain from premarital sex" may indirectly influence the practice of withdrawing girls from school when parents are concerned their daughter might receive unwanted sexual attention. It has been argued that understanding the universe of norms affecting a given practice can contribute to the design of effective interventions (Cislaghi and Heise 2018b).

Recognising that SC/ST communities in north Karnataka adhere to strong social norms and attitudes related to girl's education, gender roles, early marriage, and sexual initiation, *Samata* aimed to address these through an intense multi-layered intervention working with girls, their families (parents or guardians), boys and other key stakeholders in the community (T. S. Beattie et al. 2015). The norm change components of the intervention included work at multiple levels. At the individual level, the programme aimed to address adolescent girls' attitudes and beliefs around their education and marriage. At the family-level, the programme aimed to address traditional norms (both direct and indirect norms) that encourage families to marry daughters early and withdraw their daughters from secondary education. The community level intervention was implemented at two levels. First, the programme worked with adolescent boys in the villages to challenge gender norms that allow boys to be disrespectful towards girls (e.g. eve-teasing) and devalue their education. Second, the intervention worked with school teachers to encourage them to value girls' education, to actively track and follow-up when girls miss school, and to make the school a more welcoming environment for girls. Further details of the intervention can be found here (Raghavendra and Anderson 2013).

This was among the first trial of its' kind globally. At trial end, we found no overall impact on child marriage or retention of girls in secondary school, although we did see a small but significant increase in female school retention in one of the two districts (Prakash et al. 2019). We also found that child marriage and school drop-out rates at trial end were far lower than we anticipated (based on district level data available at the start of the trial) in both the intervention and comparison communities, perhaps reflecting secular trends in child marriage and secondary school attendance across India (T S. Beattie et al. 2019). In this

current analysis, we sought to: (i) examine if the intervention had an impact on family level (parents or guardians) attitudes and norms related to girl's education and early marriage; (ii) explore whether family level attitudes and social sanctions have changed over time; and (iii) understand how direct and indirect norms and attitudes at the family level are associated with girls' secondary education and marriage. Findings from this study will shed new light on what is holding certain behaviours in place in this context, leading to more effective strategies for transforming deeply entrenched gender norms and behaviours.

Methods

Study design and participants

Data used for the analysis were drawn from two cross-sectional surveys with adolescent girls and their family members who participated in the baseline and endline behavioural surveys of the *Samata* evaluation. The evaluation design involved a two-arm cluster-randomised controlled trial with parallel assignment, using a mixed-method approach; baseline and endline quantitative surveys, a longitudinal qualitative study, and process evaluation, and has been previously described (T. S. Beattie et al. 2015).

In brief, from a sample frame of 121 villages, 80 village clusters[1] (40 intervention, 40 control) were randomly selected encompassing 296 villages (119 intervention, 177 control) and 129 secondary schools (69 intervention, 60 control) (21). From 80 village clusters, a cohort of 2457 adolescent girls from SC/ST communities who were in standard 7 in 2012 and 2013 (the final year of primary school) were eligible for the baseline study. Of these, 2275 adolescent girls (92.5%) and 2257 family members (91.9%) participated in the baseline study (Feb-Jun 2014 (cohort 1); Jul-Sep 2014 (cohort 2)). At endline, 1788 adolescent girls (72.7%) and 1840 family member (74.9%) participated in the survey (May-Jul 2016 (cohort 1); May-Jul 2017 (cohort 2)), after the completion of secondary school final exams. At both baseline and endline, questionnaires were translated into *Kannada* and pre-tested with adults from non-trial villages, before being

[1] A 'village cluster' comprises one 'main' village with one or more eligible high-schools plus the surrounding 'feeder' villages, which do not contain a high-school but have SC/ST adolescents living there who attend the high-school in the 'main' village.

finalised for the survey. To assess changes in individual attitudes and family level norms related to girls' education, marriage and mobility/teasing, we used longitudinal data collected from 4097 family members (2257 baseline and 1840 endline) interviewed in two survey rounds between 2014-2017. In addition, we used data collected from 1788 girls at endline to assess associations between family level attitudes and norms and girls' education and marriage outcomes at age 15/16 years. Data was collected using paper-based questionnaire and double entered using the Census and Survey Processing System (CSPro; https://www.census.gov/population/internatioan/software/cspro).

Ethics

Parents/guardians provided written informed consent, and adolescent girls provided written informed assent, for their participation in the study. The surveys were administered by trained female field investigators and all interviews were conducted in Kannada (the local language) in a private setting. Repeat visits were made to find girls or family members who were not available on the survey day. Interviewers referred girls needing help or counselling support to the nearest *Santhwana Centre*[2]. The study was approved by ethics committees at St John's Medical College, Bangalore (Ref 111/2013), LSHTM (Ref 7083), and the University of Manitoba (Ref H2014:414). The study protocol was registered at clinicaltrials.gov (NCT01996241) (T. S. Beattie et al. 2015).

Measures

Family Questionnaires: A set of statements depicting different attitudes, direct norms and beliefs about negative consequences around marriage (7 statements) and education (7 statements), and indirect norms related to family honour and marriage (eve-teasing and freedom of movement (4 statements)) were used to assess the effect of the intervention on these outcomes at endline as well as changes in attitudes and norms during the project period (Appendix Table 1). All statements were asked on a 3-point Likert Scale (1=agree, 2=somewhat agree, 3=disagree) and are fully described in the results Tables. While some were asked in a

[2] Government-funded centres providing financial and emotional support to women experiencing violence, forced marriage, and other gender-based issues

'positive' direction, relative to a set of progressive values (e.g. Our family believes in the value of girls completing their secondary school education), the remainder were in a 'negative' direction relative to a set of progressive values (e.g. It is best if girls get married before age 18). To maintain the uniformity, at the analysis stage, we made all statements represent negative attitudes and norms (relative to progressive values) among family members (Appendix Table 1). All statements were converted into binary statements by coding agree/somewhat agree as 1, and disagree as 0; for simplicity in the text, we have called this 'agree vs. disagree'.

Girls' questionnaire: one outcome related to education (completion of secondary school [appeared for 10th standard exam]) and one on child marriage (proportion married by trial end line), were used in the analysis. All analyses were conducted using STATA (version 14.0; StataCorp, College Station, TX).

Analysis

The analyses pre-specified in the protocol and trial registration focused on the primary outcomes of school retention and child marriage and were reported in the main Trial paper (Prakash et al. 2019). This current paper reports on secondary, exploratory analyses of the trial data. The statistical analysis comprised of four steps: (i) we first report the profile of participants who responded to the family level questionnaire and analyse differences in the characteristics of participants at endline compared with baseline (to assess any significant changes in the profile of respondents between baseline and endline) as well as differences in the characteristics of participants in the intervention compared with the control trial arm at endline (to compare the profile across arms). Next, (ii) to assess the impact of the intervention on social norms, we examine individual-level analysis of attitudes and norms reported by family members by trial arm at endline; (iii) to assess changes in family-level social norms and attitudes over time, we compared the cluster-level summaries of attitudes and norms between baseline and endline. Finally, (iv) we assess associations at endline between family level attitudes and social norms and girls' education and marriage outcomes using logistic regression analysis.

To assess the intervention effect on reported attitudes and social norms of family members, individual-level endline data of family members was used. This analysis accounted for clustering of family-level norms within villages and used mixed-effects regression models. Unadjusted analyses of outcomes controlled for village strata and cluster at baseline. Adjusted analyses controlled additionally for literacy status and caste of respondent, as well as village type (feeder vs main).

To assess changes in family-level social norms and attitudes over time, we examined cluster-level summaries at endline compared with baseline, both overall and by trial arm. Cluster-level summaries are presented in the form of line graphs for each of the outcomes of interest (marriage, education, eve-teasing and freedom of movement). Three lines were plotted in these graphs representing changes between baseline and endline in a 'positive' direction (i.e. norms became more gender equitable over time) (green colour lines), changes in a 'negative' direction (red colour lines) (i.e. norms became less gender equitable over time) and no change (blue lines).

To examine if family level attitudes and norms were indeed associated with girl education and marriage outcomes, we used endline data from families and girls. Associations are reported in the form of adjusted odds-ratio (aOR) and 95% confidence intervals (CI). The regression analysis adjusted for family-level characteristics that differed between the baseline and endline trial survey rounds (age and sex of the respondent, literacy, occupation, relationship to adolescent girl (parent, grandparent, spouse etc.), and for other variables selected *a-priori* (control vs. intervention arm, study cohort (chort-1 vs. 2), village type (feeder vs. main), and district (Bagalkote vs. Vijayapura)).

Results

Study Population

The median age of participants responding to the family questionnaire was 39 years (IQR: 35.0-45.0); two thirds (67%) were female and two thirds (68%) were illiterate (Table 1). Most (83%) were married. While the majority were engaged in agricultural or informal labour (78%) and around 14% were unemployed, a

small minority (8%) had their own business or salaried employment. Most participants were parents (83%), or grandparents (6%). At each survey round, about 77% of family-level respondents belonged to scheduled caste; 20% were from the poorest economic group (relative to the rest of the sample), and 60% belonged to a family with a non-literate household head.

Family level attitudes and norms at endline by trial arm

Table 2 shows the effect of *Samata* on attitudes, descriptive norms, injunctive norms and beliefs about negative outcomes at endline among the family members, by trial arm. Cluster-level findings were similar to individual-level analyses and so we have presented only individual-level analyses in Table 2. We found a significant shift in injunctive norms around early marriage for girls (the majority of people important to me expect me to arrange my daughter's marriage before she reaches 18) in the intervention arm (32% agree) compared with the control arm (37% agree); and a significant worsening in the injunctive norm related to eve teasing and family honour (the majority of people important to me would question my daughters modesty if she attracted teasing and attention from boys) (43% agree intervention vs. 36% control). We found little difference by trial arm in any other statement related to marriage, education, eve teasing or mobility.

Changes in family level attitudes and norms between baseline and endline (cluster-level summaries)

To assess changes in family-level social norms and attitudes over time, we examined cluster-level summaries at end line compared with baseline, both overall and by trial arm. We found no difference when we stratified by trial arm compared with overall (data not shown) and so to simplify the results and increase study power, we present overall findings only (Figures 1a-1c). The intra-cluster correlation was almost 1.0 for all statements suggesting that families within each village-cluster had similar attitudes and perceptions.

Cluster-level summaries of attitudes and norms around girls' marriage (direct norm) are presented in Table 1a. Results show that compared to baseline, there was a shift in ideal age of marriage (it is best that the girls marry before age 18) (40% agree at baseline vs. 25% at endline) and a similar shift in the descriptive norm 'most of the families in the village marry their daughter before age 18' (68% agree at baseline vs 57% at endline). However, around one-third of respondents at both time points (30% baseline and 34% endline) reported that others expected them to marry their daughter before she turns 18 (injunctive norm). Dowry payment seems to be highly normative, with 90% of families at both time-points believing that it is necessary to give dowry to arrange a good marriage and approximately two-thirds of family believing that the cost of marriage would go up if a girl was married after age 18 (60% agree baseline vs. 65% endline). Only a few families (9% baseline vs. 8% endline) reported shame as a negative consequence resulting from later age of marriage.

Figure 1b shows cluster-level summaries of attitudes and norms around girls' education (direct norm). Just under one quarter of participants believed 'it is unnecessary to educate girls because they will eventually marry and leave' (22% agree baseline vs. 25% endline), and around 20% said 'my family does not believe in the value of girls completing secondary school' (19% agree baseline vs. 22% endline), with little evidence of change in these attitudes over time. There was an increase in the proportion of families who thought 'the majority of families in my village do not send their daughters to school' (50% baseline; 60% follow-up), and a slight increase in the proportion who thought 'the majority of people important to me think I should not send my daughter to secondary school' (13% agree baseline vs. 17% endline). The prioritisation of boys education over girls appears highly normative with 80% of participants at both time-points agreeing that 'most families in my village educate their sons longer than daughters', and 42% of participants at baseline and 51% at end line agreeing that 'the majority of people important to me think I should educate my sons longer than my daughters'. Interestingly, most families agreed that if their daughters dropped out of secondary school, this would lead to child marriage with an increase between baseline (50%) and endline (77%).

Figure 1c shows cluster-level summaries of attitudes and norms around eve teasing and girl's mobility (indirect norm). 24% at baseline and 22% at end line agreed that 'it is a girl's fault if she is sexually harassed by a fellow pupil or teacher'. A substantial proportion (44% baseline; 53% endline) also reported that the majority of families in their village would blame girls if they get harassed or teased, with a significant increase over time (as girls aged). Similarly, there were substantial increases in gender inequitable injunctive norms around eve teasing (the majority of people important to me would question my daughters' modesty if she attracted teasing and attention from boys) (12% baseline; 40% end line) and girls' mobility (the majority of people important to me expect me to protect our family reputation by not letting our daughter roam free in the village (28% baseline; 63% endline).

Associations with family-level attitudes and norms on daughters' schooling and marriage

One of the core aims of this paper was to assess whether the family level attitudes and norms thought to be important for schooling and marriage outcomes, were indeed associated with the main trial outcomes (secondary school completion and delays in marriage). Table 3 shows associations between family level attitudes/ norms at end line and (i) secondary school completion and (ii) child marriage rates.

In adjusted analyses, we found that endline levels of secondary school completion were significantly associated with personal disapproval of child marriage (aOR:0.49; 95% CI: 0.38-0.63), perceived norms around child marriage (aOR:0.64; 95% CI: 0.50-0.81) and not anticipating family shame if a girl is married after age 18 (aOR: 0.49; 95% CI: 0.34-0.70). Attitudes and norms related to dowry costs were not associated with secondary school completion. Secondary school completion was associated with more supportive attitudes and perceived norms about the importance of secondary education for girls (aOR: 0.26; 95% CI: 0.19-0.34), and not valuing boys' education over girls' (aOR: 0.66; 95% CI: 0.52-0.83). There was no association between secondary school completion for girls and believing that dropping out of school would lead to child marriage. Although there was no association between families' attitudes or descriptive norms around eve teasing (indirect norm) and secondary school completion, there was a strong association between secondary school completion and injunctive norms related to eve teasing and girls' mobility.

Specifically, girls were less likely to complete secondary school if their families perceived normative pressure to protect the family's reputation (aOR: 0.76; 95% CI: 0.60-0.96) and reported that those important to them would question their daughters' modesty if she attracted teasing and attention from boys (aOR: 0.78; 95% CI: 0.61-0.99).

Similarly, child marriage was more frequently observed among girls from families with more supportive attitudes toward child marriage (aOR: 3.99; 95% CI: 2.68-5.94), and who perceived child marriage as more common and more expected of them by others (injunctive norm) (aOR: 2.29; 95% CI: 1.52-3.45 and aOR: 2.32; 95% CI: 1.60-3.36). It was also more common in families that perceived that marrying a child after 18 would bring shame upon the family (aOR: 2.57; 95% CI: 1.54-4.30). It was not associated, however, with beliefs or perceptions about the practice of dowry or the costs of marriage for older women over 18. We found no associations between families' attitudes or descriptive norms related to eve teasing (indirect norm), and child marriage. However, attitudes and injunctive norms that do not value girls completing secondary school education (indirect norm), and injunctive norms (aOR: 2.30; 95% CI: 1.50-3.52), related to eve teasing (indirect norm) (aOR: 1.50; 95% CI: 1.03-2.20) and girls' mobility (indirect norm) (aOR: 1.56; 95% CI: 1.04-2.35), were all strongly associated with child marriage.

Discussion:

In this study, we found little impact of the *Samata* intervention on either family-level attitudes or norms related to girls' education, child marriage, eve teasing or girl's mobility. However, when we pooled data from across trial arms, we did find that some attitudes, norms and beliefs about negative outcomes related to not following the social norm (i.e. child marriage or girl school drop-out) shifted between baseline (when girls were aged 13-14 years) and endline (when girls were aged 15-16 years), with some becoming more progressive (e.g. around child marriage) but most becoming more restrictive (e.g. around value of girls' secondary education, blaming girls for eve teasing, and limiting girls' mobility so as to protect family honour). This is consistent with the tightening of restrictions on girls once they reach menarche and begin to attract attention from boys and young men. In addition, we found that patriarchal injunctive norms

around girls' education, early marriage, eve teasing and freedom of movement (i.e. what I think others think I should do) were strongly associated with child marriage and secondary school non-completion among adolescent SC/ST girls in this rural South Indian setting. Together these findings suggest that the direct and indirect norms hypothesised to be important for marriage and schooling outcomes were indeed associated with these outcomes, but that the intervention did not significantly impact on most of these norms. These findings are consistent with our findings from the main Trial that found no overall impact of *Samata* on child marriage or secondary school drop-out (Prakash et al. 2019). Furthermore, despite improvements at the national level in secondary school completion and age at marriage (T S. Beattie et al. 2019), in this setting, as girls reach mid-adolescence, norms around maintaining family honour and therefore restricting girls' mobility and her education, become more rigid.

Our original study hypothesis was that school drop-out and child marriage were linked, and that preventing the former would help delay a girl's age at marriage (T. S. Beattie et al. 2015). However, our subsequent research has found that school drop-out and child marriage are not necessarily causally connected, with one frequently occurring without the other (Ramanaik et al. 2018; Prakash et al. 2019). Thus, while child marriage is often linked with fears around family honour, and can lead to subsequent withdrawal from education, school drop-out without marriage is often associated with family deprivation. In our current analysis, we find that family-level attitudes and direct and indirect norms have a strong association with child marriage and schooling outcomes. Our findings contribute to the social norms literature by highlighting a possible constellation of norms directly and indirectly sustaining child marriage and girls' withdrawal from education. Thus, maintaining a girl's sexual 'purity' (and her family's honour) is an underlying indirect norm that can result in restricting a girl's mobility, withdrawing her from education, fearing the impact of 'eve teasing' and marrying a girl when she reaches menarche (Ramanaik et al. 2018).

We found little evidence of impact of *Samata* on family-level attitudes or norms. Although social norms were identified as a target in the project's original theory of change, the initial focus of *Samata* was on

empowering girls, encouraging boys to support girls' education, working with schools, and linking families to government schemes for school uniforms, books, and tutoring. It was only after qualitative research revealed the importance of attitudes and norms around family honor that the project shifted to work more directly with families. Efforts to shift norms may have been too diffuse and too short lived to have had impact. In addition, the intervention took place in the context of sweeping secular changes occurring in India with regards to girls' education and child marriage (T S. Beattie et al. 2019), with secondary school completion rates far higher and child marriage rates far lower at endline than we anticipated when designing the trial. In such a context, it may have been difficult to shift norms over and above what was already occurring in the local context.

Although our intervention did not demonstrate an effect, the social norms literature does document a range of social norms interventions that have successfully changed behaviour. A recent systematic review by Yamin and colleagues (Yamin et al. 2019), for example, found a large proportion (89%) of the social norms interventions they reviewed to be effective, although 83 out of 89 studies they reviewed were from high-income countries. The RCT literature on effectiveness of social norms interventions in low and middle-income countries, and especially the literature on interventions tackling gender-related practices is limited, with most studies looking at gender attitudes, rather than norms (e.g. (Doyle et al. 2018; Saeed Ali et al. 2017)), with some notable exceptions including (Ashburn et al. 2017; Pettifor et al. 2015). Some commentators suggest that norms related to gender require a longer time to change, and that any single intervention is only contributing to a slow historical change process that might take years to complete (Seguino 2007; Inglehart et al. 2017).

Whether descriptive or injunctive norms exert more influence on people's behaviour is an open question in the literature (Schultz et al. 2007). The existing evidence is contradictory: empirical studies (conducted on a variety of health outcomes) suggest that either descriptive norms are stronger (Reno et al. 1993), that

injunctive norms are stronger (Hamann et al. 2015), or that neither is stronger and what matters is their alignment (Lee et al. 2007; J. R. Smith and Louis 2008; Joanne R Smith et al. 2012). While most of our findings confirm that both descriptive and injunctive direct norms are important for child marriage and girls' education, respectively, when we examined associations between indirect norms (marriage or education, eve teasing, girls' mobility) and these outcomes (education; marriage, respectively), we found that indirect injunctive norms were most strongly associated with these outcomes in this setting. Deviating from strong social norms is challenging for SC/ST families living in rural north Karnataka where communities are tightly knit and everyone knows everyone else's business. Our qualitative research suggests, that decisions around marriage often involves extended family (grandparents, maternal uncles, brothers etc.) and discussions with other families (parents of potential spouses), with such discussions starting any time after the birth of a girl child. In contrast, the decision to withdraw or keep a child in school may be made more immediately and in response to factors which don't necessarily involve extended family members (e.g. the girls' academic achievement; the need for female labour within the home, etc) (Bhagavatheeswaran et al. 2016; Ramanaik et al. 2018). Thus, shifting norms related to family honour and child marriage may be more complex than shifting norms related to keeping girls in secondary school, and may not be captured within programmatic timeframes.

Our study benefited from the randomised controlled trial design, involving a large number of clusters. This meant we could rigorously test the impact of our intervention in an unbiased, rigorous way. The longitudinal design and the large sample size also meant we were able to analyse changes over time and include analyses at a cluster as well as at an individual level. Surveying both families and girls meant we could examine associations between family-level norms and girls' outcomes. As well as these strengths, our study also had limitations. Social norms research is a new and rapidly evolving academic field, which made the measurement and analysis of our attitudes and norms data challenging and complex, especially as we were wanting to capture data on different social norms (marriage, education, eve teasing, mobility) and across multiple domains (attitudes, descriptive and injunctive norms, beliefs around negative outcomes related to

deviating from the norm). This meant the questions we asked may not have been the most ideal to capture the norms and domains we were trying to measure. The data captured may have been subject to social desirability bias, particularly due to the national and state level campaigns promoting girls' education and the new laws making child marriage illegal (T S. Beattie et al. 2019). This may have resulted in under-reporting in non-desirable attitudes and norms related to these outcomes, and also in under-reporting by girls of their marital and educational statuses at trial endline. Some of the attitudes like most of the population endorsing necessity of dowry were secularly prevalent in the society across the Trial arms, and hence, may not show its association with education. The cross-sectional analysis we conducted using endline data means we cannot infer causation with regards to family-level norms and marriage/education outcomes. Although less-progressive norms were associated with school-drop out and child marriage, this could have been due to post-event rationalisation by parents. Future analyses will examine the predictors of school dropout and child marriage, to include a range of factors including family-level norms, using longitudinal girl and family data. Lastly, as this study was an exploratory study nested within the main trial, the outcomes reported in this study were not included in the trial registration.

Taken together, the main Trial found no overall impact of *Samata* on child marriage or secondary school drop-out among low-caste adolescent girls at trial end. However, the findings from the secondary analyses presented here suggest that family-level norms related to education, marriage, eve teasing and girls' mobility are strongly associated with marriage and education outcomes among 15-16 years old adolescent girls in this setting. In addition, these are influenced by underlying norms related to girl's sexual purity and family honour. Future interventions looking to shift these norms would benefit from working intensively with families and communities, identifying context-specific indirect norms prior to the start of interventions, and focusing efforts on creating new positive norms (rather than challenging deeply held existing norms). Our findings are important in the context of the wider social norm field because at present, there are few well-tested interventions focused on shifting purity and marriage norms. Existing evaluated interventions have focused on gender norm change as it relates to promoting reproductive health or reducing

violence against women and girls (Levy et al. 2020); however, the effect of norm change interventions on girls' education and early marriage have been less explored. Findings from this study will help pave the path to effectively designing future norm change interventions in a similar context.

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Registration

ClinicalTrials.GovNCT01996241.

Protocol

The trial protocol can be accessed at: https://www.ncbi.nlm.nih.gov/pubmed/25881037

Compliance with ethical standards

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Disclosure of potential conflicts of interest

On behalf of all the co-authors, I declare no conflicts of interest.

Ethical approval

The study was approved by ethics committees at St John's Medical College, Bangalore (Ref 111/2013), LSHTM (Ref 7083), and the University of Manitoba (Ref H2014:414). This information is also being included in the method section of the manuscript.

Informed consent

Written informed consents were obtained from family members (parents/guardians) participated in the study. Written consents were also obtained from the family members about the participation of adolescent girls from their household. Separate informed assents (written) were taken from adolescent girls before their participation in the study. The surveys were administered by trained female field investigators to ensure the sensitivity and all the questions were asked in the local language (i.e. *Kannada).*

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