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A measure for social norms and personal beliefs on child marriage: Developing the Child Marriage Acceptability Scale (CMAS)

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Abstract

Background

Child marriage persists due to poverty, social norms, gender inequality and limited education and has a disproportionate impact on girls' lives. Given the growing recognition of the role of social norms in perpetuating child marriage, we sought to develop a measure that captures child marriage acceptability using data from Ethiopia, Indonesia, Kenya, Malawi and Zambia.

Methods

We conducted a household survey (n = 6,559) among young people (15-24 years) alongside interviews and focus group discussions with various community members. Using a split-sample approach, we conducted an exploratory factor analysis (EFA), followed by a confirmatory factor analysis (CFA). Validation included multiple linear regression and triangulation with qualitative findings.

Results

The EFA resulted in a three-factor model of 'Social Norms', 'Personal Beliefs' and 'Economic Aspects', confirmed by CFA. Thirty-seven items were reduced to a 28-item Child Marriage Acceptability Scale (CMAS). We calculated CMAS scores (from 1 – 5 with 5 denoting the highest acceptability), with Indonesia scoring the highest acceptability (2.37) and Malawi scoring the lowest acceptability (1.69). Multiple regression analysis confirmed the hypothesis that CMAS scores were inversely related to girls' 'ideal age of marriage',

‘minimum acceptable age of marriage’ and ‘age of first marriage’. The qualitative findings confirmed key reasons of child marriage acceptability including gender roles, tradition, family honour, economic and educational factors, amongst others.

Conclusion

Measurement of social norms has been a major challenge for civil society. The CMAS fills this gap and makes a novel contribution in measuring the role of social norms, personal beliefs and economic aspects to assess the acceptability of child marriage. The CMAS is a 28-item, validated tested in five countries, with good initial psychometric properties. Policymakers and practitioners can use the CMAS to assess acceptability over time, informing efforts to reduce child marriage.

Keywords: child marriage acceptability scale, social norms, girls, young women, beliefs, child marriage

Plain English language summary

When a girl marries under 18 years, it is a child marriage. Families think child marriage is okay because they are poor, believe girls don’t need an education, or because it is common in their community (social norm). We have no way of measuring why people think child marriage is acceptable.

We surveyed and interviewed youth (15-24 years) in five countries and spoke to community members. Using statistical techniques, we used one part of the survey data to identify common themes in people’s responses, and the other part to see if these themes held true. We did further statistical analysis and compared survey results with interview data.

The analysis identified and confirmed the existence of three themes (three-factor model), which we call ‘Social Norms’, ‘Personal Beliefs’ and ‘Economic Aspects’. The final tool called Child Marriage Acceptability Scale (CMAS) had 28 questions and produced a score (Indonesia scored the highest and Malawi scored the lowest). Further analysis confirmed our idea that higher scores were linked to youth saying girls should marry at younger ages, and to lower ages of girls marrying. The interviews showed that fixed societal roles of men and women, traditions, honor, poverty, and low access to and value of education were why people felt child marriage was okay.

Tested in five countries, our data shows that the CMAS is a reliable tool that measures how acceptable people think child marriage is. Governments and organisations can use it to see if they are helping reduce acceptability over time.

List of Abbreviations

CMAI: Child Marriage Acceptability Index

CMAS: Child Marriage Acceptability Scale

SRHR: Sexual and Reproductive Health and Rights

FGD: Focus Group Discussion

IDI: In-depth Interview

KII: Key Information Interview

EFA: Exploratory Factor Analysis

CFA: Confirmatory Factor Analysis

Introduction

The world is 300 years away from ending child marriage — a human rights violation, which disproportionately affects the lives of girls and young women (1). Defined as a union in which one or both spouses are under the age of 18, the last decade has seen child marriage fall from 23% to 19% globally, with the biggest decline in South Asia (1). Despite progress, the practice remains common in South Asia, Sub-Saharan Africa, Latin America, the Middle-East, and North Africa, with Sub-Saharan Africa projected to retain high child marriage rates in the coming decades (1).

The consequences of child marriage are profound, negatively affecting nearly every aspect of a girl's life. Married girls are more likely to drop out of school, restricting their potential for financial independence, increasing economic disadvantage and limiting their agency (2–4). Married girls further face risks of early pregnancy, childbirth, domestic violence, social isolation, and mental health challenges (5,6). Beyond individual harm, child marriage further perpetuates cycles of poverty and gender inequality across generations (7).

A multitude of interdependent factors contribute to the persistence of child marriage worldwide. Psaki et al. (2021) identify two core drivers of the practice: social norms and attitudes, and poverty and economic factors. These core drivers underlie a lack of agency, lack of opportunity, and fear of girls' sexuality and pregnancy, all contributing to child marriage (8). Poverty, for example, limits access to education and restricts livelihood opportunities, such that child marriage acts as a means of securing financial stability or reducing economic burdens (2,9,10). Social norms – the unwritten rules governing acceptable behaviour in a society or group' (11) – can further contribute to these economic drivers of child marriage by positioning girls as financial burdens (and boys as family assets) (12). Child marriage is sometimes seen as a way to protect girls from sexual violence or pre-marital sex or pregnancy, thereby preserving the perceived honour of both girls and their

families (9). Indeed, pre-marital pregnancy itself can also be a driver of child marriage, again to preserve family honour (10).

Global efforts to reduce child marriage have focused on expanding educational and livelihood opportunities for girls and their families. More recently, programmes have deliberately attempted to address social norms. Social norms change interventions seek to change social norms associated with unhealthy or harmful behaviour, which are closely linked to cultural perceptions and community attitudes towards child marriage (13).

While several indicators have been developed to monitor the outcomes of interventions aiming to reduce child marriage, including measures of educational attainment, adolescent pregnancy rates, access to economic resources, and gender-based violence, how to best measure social norms as a driver of child marriage remains a significant challenge (14). Self-reported measures of norms are susceptible to challenges, akin to challenges faced by measures of implicit attitudes, discrepancies between self-reported beliefs and observed behaviour(s), the risk of social desirability bias when individuals are asked about a sensitive topic, and difficulties in standardising measures for a construct as culturally variable as social norms (15,16).

Developed in 2015 by Plan International, with Coram Children's Legal Centre, the Child Marriage Acceptability Index (CMAI) was initially designed to measure norms and structural environmental factors that influence the acceptability of child marriage in Asian contexts (18). The *Yes I Do* programme (2016-2020) – aimed at reducing child marriage, teenage pregnancy, and female genital mutilation/cutting – used the CMAI in its baseline evaluation in Ethiopia, Indonesia, Kenya, Malawi, Mozambique, Pakistan and Zambia.

As a newly developed tool, however, the CMAI had not previously undergone any validity testing. Moreover, use of the tool during the 2016 baseline identified several ambiguous statements and a noticeable absence of items focusing on social norms. The latter is particularly problematic given the complex interplay between context, social, and gender norms, and the known discrepancies between personal beliefs and individual behaviours (17). For example, while a parent may believe that child marriage has no benefits for their daughter (personal belief on non-acceptability of child marriage), social norms around sexuality and pregnancy (e.g., marriage as the 'solution' if a girl is pregnant) or certain societal or economic pressures or incentives (e.g., economic advantages of receiving dowries or being in receipt of 'bride prices') (13,17) may still result in child marriage. A long history of theorising how social norms influence personal beliefs and individual behaviour (11) has resulted in complicated definitions that are difficult for practitioners to operationalise (18). Building on Plan International's efforts, we therefore sought to improve the CMAI by, first, developing new item statements focusing on personal beliefs and social norms concerning child marriage, and, second, by testing this revised measure's reliability and construct validity across five different contexts.

Methodology

Research design and procedures

The new Child Marriage Acceptability Scale (CMAS) was developed and validated in three steps. First, and informed by literature (13,14,17,19–21) and the experience conducting the baseline of the *Yes I Do* programme (22), we reviewed the items of the CMAI. Each item was assessed for face validity and new items were developed to reflect personal beliefs and social norms. We then administered the revised CMAI as part of an endline evaluation taking place in Ethiopia, Indonesia, Kenya, Malawi, and Zambia, and used exploratory approaches to explore the revised scale's underlying factor structure. Finally, we employed additional validation approaches with the remaining data, and we compared results to qualitative findings from the *Yes I Do* endline evaluation.

Measures

The revised CMAI measure included 37 items: 15 items reflecting personal beliefs and 17 reflecting social norms, and five additional statements focused on education and economic aspects that would make child marriage acceptable (Table 1). To assess personal beliefs, respondents were asked to respond to items by indicating whether they thought these statements were 'wrong' and if so, whether they would be willing to speak up on this item (agree = 1, unsure = 2, disagree and not ready to share = 3, disagree and ready to share = 4). For the social norm items, respondents were asked to think of the people around them whose opinions they value and answer the questions with those individuals in mind. Respondents could choose options ranging from none to all (none = 1, few = 2, half =3, most = 4, all = 5). Statements pertained to reasons of child marriage, as identified from the literature, including the influence of gender roles, agency and decision-making, family honour, dowry, protection from sexual violence, pregnancy and fertility, traditions and religion, law enforcement. Statements on education and economic aspects were scored on a 7-item Likert scale (strongly disagree = 1, disagree =2, slightly disagree = 3, neither agree nor disagree =4, slightly agree = 5, agree = 6, strongly agree = 7, don't know = 8, recoded as missing in the analysis).

Table 1. *List of statements of the revised CMAI*

	We would like to know if you think any of the following statements are wrong and should be changed in your community. We also would like to understand how ready or willing you are to take action by speaking out on the issues you think are wrong. *Answer options: Agree = 1, Unsure = 2, Disagree and not ready to share = 3, Disagree and ready to share = 4*
	A girl marrying under 18 is preferable because younger brides are more obedient and respectful of their husbands
	Marrying a girl under 18 protects her from pre-marital sex

A girl marrying under 18 is acceptable because she does not need secondary education
A girl marrying under 18 is acceptable as only the husband needs to work in the future
A girl marrying under 18 will ensure that she gets a good groom
Even if a girl does not want to be married she should honour the decisions/ wishes of her family
Marrying a girl under 18 protects her family's honour and reputation
Marrying a girl under 18 resolves family disputes
It is acceptable for a girl to marry under 18 if she is in love
Marrying a girl under 18 protects her from sexual violence and sexual harassment
A pregnant girl should marry, even if she is under 18
An unmarried girl who is pregnant is a bad girl
A married girl under 18 will give birth to healthier babies than girls who marry later
Girls should marry under 18 as it is part of our religious practices
Girls should marry under 18 to respect our traditions/culture
How many of the people whose opinion matters most to you…. *Answer options: None = 1, Few = 2, Half =3, Most = 4, All = 5*
Think that a girl marrying under 18 is preferable because younger brides are more obedient and respectful of their husbands
Think marrying a girl under 18 protects them from pre-marital sex
Think a girl marrying under 18 is acceptable because she does not need secondary education
Think a girl marrying under 18 is acceptable as only the husband needs to work in the future
Expect girls to be married before the age of 18
Think that a girl marrying under 18 will get a good groom
Think that it is okay to marry a girl under 18 to protect her family's honour and reputation
Think that it is okay to marry a girl under 18 to resolve family disputes
Accept marriage of girls under 18 years if she is in love
Expect girls under 18 to agree with marriage decisions that are made by others
Think that marrying girls under 18 protects her from sexual violence and sexual harassment
Expect a pregnant girl to marry, even if she is under 18
Think that an unmarried girl who is pregnant is a bad girl
It is acceptable for a girl to marry under 18 as she will give birth to healthier babies than girls who marry later
Think that marrying girls under 18 is part of our religious practices
Think that marrying girls under 18 is part of our traditions/ culture
Think that if a girl marries under the age of 18, her family should pay a fine or be arrested

It is acceptable for a girl to marry under 18.... *Answer options: Strongly Disagree = 1, Disagree = 2, Slightly disagree = 3, Neither Agree nor Disagree = 4, Slightly agree = 5, Agree = 6, Strongly Agree = 7, Don't know = 8 (coded as missing in the analysis)*
Because there is a lack of education opportunities
Because there are no job opportunities for her to work
To solve financial problems of the family
To marry under 18 to give her financial security
To reduce the poverty of her family

Sampling and recruitment

The endline evaluation consisted of a household survey, which contained all 37 items of the revised CMAI (Table 1). Survey respondents were young women and men aged between 15 and 24 years from *Yes I Do* implementation sites in each country. In Malawi and Kenya, a non-implementation site was also sampled. A two-stage cluster sampling was used. In the first stage, villages or hamlets or enumeration areas were treated as clusters and were selected using a (pseudo-) random approach. In the second stage, households were randomly selected using systematic sampling, with one young person from each household completing the survey. In West Lombok in Indonesia and the Malawi study sites, between 25 to 30 households were selected at random from each cluster while in Ethiopia and Zambia, the number of households were selected at random, proportional to population size of the village. In Sukabumi, Indonesia, all hamlets were sampled, and households were sampled at random, proportional to population size. In Kenya, in the study sites, accessibility to households and certain villages was challenging due to large distances between them. Hence, villages and households were purposively sampled.

The sample size was calculated to detect a 10% reduction over five years in the proportion of young women (15–24) with a live birth or first pregnancy, using a power of 0.8, significance level (α) of 0.05, design effect of 1.5, and a female-to-male ratio of 75:25 given the disproportionate impact from child marriage on women. The final sample size, after data management, was 6,559 across all countries (1,589 = Indonesia, 1,530 = Ethiopia, 1,409 = Kenya, 1,622 = Malawi, 809 = Zambia). The mean age of respondents was 18.8 years. The sample consisted of 74% female and 26% male respondents.

The qualitative study component included purposively selected young people, parents/caregivers, religious leaders, community leaders, health workers, community-based and youth organisations, and governmental stakeholders, who took part in focus group discussions (FGDs), in-depth interviews (IDIs) and/or key informant interviews (KIIs). FGDs focused on group norms and perspectives around child marriage, its reasons and circumstances. IDIs captured personal experiences and opinions on child marriage. KIIs were

conducted with persons who were knowledgeable about child marriage and related practices in the study sites. The qualitative component was only conducted in implementation sites in Malawi and Kenya. The number of study participants and principal data collection method per country are presented in Table 2.

Data collection was conducted by a team of female and male research assistants, supervised by a lead researcher. The survey was administered using tablets, while interviews were audio-recorded upon consent. The tools were translated from English into several languages (Bahasa Indonesia, Amharic, Swahili, Chichewa, and Chewa), with all translations discussed and agreed upon during the training with research assistants. All tools were pre-tested prior to data collection. Daily de-brief meetings were held between the research team members during data collection.

Those above 18 years old provided consent to participate. Those under 18 years (and under 16 years in Zambia) assented to participate in the study, with consent obtained from their caregivers.

Table 2. *Number of study participants, per country, and principal data collection method*

Participants/ respondents	Ethiopia	Indonesia	Kenya	Malawi	Zambia
Survey					
Young women and men (15-24 years)	1589	1530	1409	1622	809
Focus Group Discussions (FGDs) (average 8 participants per group)					
Girls 15-19 years	-	2	2	2	2
Young women 20-24 years	-	2	2	2	2
Young women 15-24 years	2	-	-	-	-
Boys 15-19 years	-	2	2	2	2
Young men 20-24 years	-	2	4	2	2
Young men 15-24 years	2	-	-	-	-
Parents and caregivers	3	3 or 4	NA	2	2
In-depth interviews (IDIs)					
Girls 15-19 years	-	6	2	2	2
Young women 20-24 years	-	4	2	2	2
Young women 15-24 years	4	-	-	-	-
Boys 15-19 years	-	4	-	2	2
Young men 20-24 years	-	4	2	2	2

Young men 15-24 years	3	-	-	-	-
Parents and caregivers	2	4	2	2	2
Grandmothers/ initiators	2	-	2	1	2
Anti-HTP[2] committee members	2	-	-	-	-
Traditional/ religious leaders	3	4	4	2	4
Teachers	3	4	2	1	2
Health/ social workers	2	6	1	1	2
CBO/ youth organization staff	3	7	2	2	-
Key Informant Interviews (KIIs)					
NGO staff	2	7	1	5	1
(District-level) Government officials	7	5	1	4	1

Analysis

Validation was conducted using mixed methods. Construct validity was examined using a split-sample approach, whereby cases were randomly assigned to one of two randomly generated databases, stratified by gender and age (23). Exploratory Factor Analysis (EFA) was conducted on the first subsample (n = 3457) to reduce the data to a smaller set of latent factors and to identify the items that best represented those factors. A geomin rotation method was specified, allowing the extracted factors to correlate, and models specifying one through six factors were estimated. Item retention was guided by several a priori criteria. Specifically, items were removed if they exhibited factor loadings below 0.45 (explaining less than 20% of variance in the latent construct); were cross-loading, defined as significant loadings on two or more factors; and showed evidence of substantial residual covariances, as indicated by modification indices. Additionally, any factors with fewer than three items demonstrating robust loadings were considered for removal (24). The final decision on the number of factors retained was further based on statistical fit, model interpretability, and theoretical coherence. The final factor structure identified in the exploratory stage was then cross-validated using Confirmatory Factor Analysis (CFA) on the second subsample (n = 3502) to test whether the factor solution adequately represented the observed data.

All analyses were conducted in MPlus (Version 8.2) (25) using the weighted least square mean and variance adjusted (WLSMV) estimator. Model fit was evaluated using standard model fit indices including $\chi 2$, where $p \geq .05$ indicates good fit; Standardized Root Mean Square Residual (SRMR), where values of $< .08$ indicates acceptable model fit (26); the Bentler Comparative Fit Index (CFI), where values of $> .90$ or $> .95$ indicate adequate and

good fit, respectively (27); Tucker-Lewis Index (TLI), where values of > .90 or > .95 indicate adequate and good fit, respectively (27); and Root Mean Square Error of Approximation (RMSEA), where values of < .08 or < .06 indicate adequate and excellent fit, respectively (28). Internal reliability was assessed using a composite reliability analysis (29).

With the final items, we calculated an average score of acceptability (from 1 to 5, with 5 denoting the highest acceptability). We further examined the relationship between average child marriage acceptability score and 'age of first marriage', 'the lowest minimum acceptable age of marriage for girls', and 'the ideal age for marriage of girls'. Respondents who reported their marital status to be 'married', 'divorced' or 'widowed' were asked for their age (in integers) when they first married. All respondents were asked what they considered to be the 'lowest acceptable age that a girl could marry' and the 'ideal age for a girl to marry'. Multiple linear regression was conducted with sex/gender[1] (male = 1, female = 0), age, country (1 = Indonesia, 2 = Ethiopia, 3 = Kenya, 4 = Malawi, 5 = Zambia), whether they were married as a child (yes = 1, no = 0) entered as covariates. Here, we hypothesised that child marriage acceptability score would be inversely related to responses provided for 'age of first marriage' and 'the lowest minimum acceptable age of marriage for girls' and to 'the ideal age for marriage of girls'.

Qualitative data was analysed using thematic content analysis. Research teams in each country coded all transcripts based on a generic coding framework developed based on the literature, baseline data, featuring key reasons that make child marriage acceptable, also included in the CMAS. As coding progressed, new codes were added. The teams then discussed the results of the coding and established themes. We compared these themes in an inter-country analysis matrix. The qualitative findings were used to validate the findings from the confirmatory factor analysis.

Ethical considerations

The KIT Institute Research Ethics Committee provided overall approval for research studies for the *Yes I Do* programme. In addition, approvals were sought and secured from the following ethics committees in each country: the Ethical Review Committee of the Amhara Region Public Health Institute in Ethiopia, the Research Ethics Commission of Unika Atmajaya Jakarta in Indonesia, the African Medical and Research Foundation (AMREF) Ethics and Research Committee in Kenya, National Health Sciences Research Committee and University of Malawi Research Ethics Committee in Malawi, and the ERES Converge

[1] In Indonesia, respondents were asked which gender they identified as while in other countries, the question referred to their sex.

Institutional Review Board and the National Health Research Authority in Zambia. In each study site, permissions were also sought at the local level (for instance from traditional leaders). The principles stated in the Declaration of Helsinki were followed by the research team.

Results

Exploratory Factor Analysis

The results of the EFA are presented in Table 3. The identifiers of the statements can be found in Table 4. Model fit indices indicated that a six-factor structure provided the best fit for the data. However, further examination of the factor loadings suggested that only two items (PB14 and PB15) loaded onto one of the factors. The five-factor model also showed acceptable fit, yet inspection revealed substantial cross-loadings, with no items loading robustly (> 0.45) on one factor. Similarly, the four-factor model indicated that all items loading above 0.45 exhibited cross-loadings onto a second factor, further limiting its interpretability.

Table 3. *Exploratory Factor Analysis Model Fit Results*

	χ^2	*df*	*p*	CFI	TLI	RMSEA (90% CI)	SRMR
One-factor	67814.166	629	<.001	0.790	0.777	0.176 (0.175-0.177)	0.277
Two-factor	38067.155	593	<.001	0.883	0.868	0.135 (0.134-0.136)	0.139
Three-factor	16532.043	558	<.001	0.950	0.940	0.091 (0.90-0.092)	0.046
Four-factor	10679.028	524	<.001	0.968	0.960	0.075 (0.074-0.076)	0.035
Five-factor	7116.318	491	<.001	0.979	0.972	0.062 (0.061-0.064)	0.029
Six-factor	5402.268	459	<.001	0.985	0.978	0.056 (0.054-0.057)	0.026

Note: χ^2 = chi-square goodness of fit statistic; df = degrees of freedom; *p* = statistical significance; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA (90% CI) = root-mean-square error of approximation with 90% confidence intervals; SRMR = standardized root-mean square residual.

In contrast, the three-factor solution demonstrated robust (>0.45), positive, and significant factor loadings across three distinct factors, except for SN17 and PB12, both of which had loadings < 0.45, and PB11, which exhibited cross-loadings on Factors 2 and 3 (Table 4). Modification indices further suggested residual covariances between SN3 and SN4, SN12 and SN13, and EE1 and EE2. Factor 1 included items that, when scored highly, describe the presence of social norms that are consistent with child marriage acceptability and was thus labelled the "Social Norms". Factor 2 included items that, when scored highly, were indicative of child marriage acceptability for "Economic" reasons and were therefore labelled "Economic". Finally, Factor 3 included items that, when endorsed, are indicative of personal beliefs that are consistent with child marriage acceptability and were labelled "Personal Beliefs".

Confirmatory Factor Analysis

Based on these results, we chose to proceed with the CFA tested a 28-item, three-factor model, excluding the following items: SN3, SN4, SN12, SN13, SN17, EE1, EE2, PB11, and PB12. This revised three-factor solution (Tables 4 and 5) demonstrated improved fit in the second randomly generated sample ($\chi 2 = 5480.888$, df = 347, $p < 0.001$, CFI = 0.976, TLI = 0.974, RMSEA = 0.065 (0.063 – 0.067), SRMR = 0.053). Composite reliability scores for each factor were 0.944, 0.975, and 0.959, for Social Norms, Economic, and Personal Beliefs, respectively. Supplementary Material 1 summarises the results of the CFA per country.

Table 4. *Standardised Factors Loadings for the Three-Factor Model*

Factor Loadings		F1	F2	F3
1.	Think that a girl marrying under 18 is preferable because younger brides are more obedient and respectful of their husbands (SN1)	0.768*	0.001	-0.058*
2.	Think that marrying a girl under 18 protects her from pre-marital sex (SN2)	0.774*	-0.016	0.109*
3.	Think that a girl marrying under 18 is acceptable because she does not need secondary education (SN3)	0.764*	-0.001	0.046*
4.	Think that a girl marrying under 18 is acceptable as only the husband needs to work in the future (SN4)	0.722*	0.058*	0.070*
5.	Expect girls to be married before the age of 18 (SN5)	0.823*	-0.047*	-0.076*
6.	Think that a girl marrying under 18 will ensure that she gets a good groom (SN6)	0.820*	0.024	-0.036*
7.	Think that marrying a girl under 18 protects her family's honour and reputation (SN7)	0.825*	0.038*	-0.037*

8.	Think that marrying a girl under 18 resolves family disputes (SN8)	0.776*	0.074*	-0.030
9.	Think that it is acceptable for a girl to marry under 18 if she is in love (SN9)	0.622*	0.033*	0.067*
10.	Expect girls under 18 to agree with marriage decisions that are made by others (SN10)	0.814*	-0.043*	-0.112*
11.	Think that marrying a girl under 18 protects her from sexual violence and sexual harassment (SN11)	0.785*	0.013	0.140*
12.	Expect a pregnant girl should marry, even if she is under 18 (SN12)	0.489*	-0.058*	0.364*
13.	Think that an unmarried girl who is pregnant is a bad girl (SN13)	0.484*	-0.099*	0.171*
14.	Think that a married girl under 18 will give birth to healthier babies than girls who marry later (SN14)	0.671*	0.122*	-0.007
15.	Think that girls should marry under 18 as it is part of our religious practices (SN15)	0.666*	0.107*	0.146*
16.	Think that girls should marry under 18 to respect our traditions/culture (SN16)	0.735*	0.056*	0.004
17.	Think that if a girl marries under the age of 18, her family should pay a fine or be arrested (SN17)	-0.171*	0.041*	0.326*
18.	Because there is a lack of education opportunities (EE1)	-0.091*	0.104*	0.912*
19.	Because there are no job opportunities for her to work (EE2)	-0.088*	0.098*	0.919*
20.	To solve financial problems of the family (EE3)	0.003	-0.027*	0.965*
21.	To marry under 18 to give her financial security (EE4)	0.005	-0.017	0.957*
22.	To reduce the poverty of her family (EE5)	0.024*	-0.030*	0.970*
23.	A girl marrying under 18 is preferable because younger brides are more obedient and respectful of their husbands (PB1)	0.000	0.773*	0.016
24.	Marrying a girl under 18 protects her from pre-marital sex (PB2)	0.018	0.715*	0.170*
25.	A girl marrying under 18 is acceptable because she does not need secondary education (PB3)	-0.085*	0.883*	-0.102*
26.	A girl marrying under 18 is acceptable as only the husband needs to work in the future (PB4)	-0.084*	0.878*	-0.039*
27.	A girl marrying under 18 will ensure that she gets a good groom (PB5)	-0.038*	0.855*	-0.015
28.	Even if a girl does not want to be married she should honour the decisions/ wishes of her family (PB6)	-0.058*	0.739*	-0.016
29.	Marrying a girl under 18 protects her family's honour and reputation (PB7)	-0.001	0.847*	0.038*

30.	Marrying a girl under 18 resolves family disputes (PB8)	0.021	0.811*	-0.024
31.	It is acceptable for a girl to marry under 18 if she is in love (PB9)	0.099*	0.647*	0.168*
32.	Marrying a girl under 18 protects her from sexual violence and sexual harassment (PB10)	0.027*	0.763*	0.169*
33.	A pregnant girl should marry, even if she is under 18 (PB11)	0.077*	0.489*	0.385*
34.	An unmarried girl who is pregnant is a bad girl (PB12)	0.138*	0.373*	0.129*
35.	A married girl under 18 will give birth to healthier babies than girls who marry later (PB13)	-0.018	0.788*	0.072*
36.	Girls should marry under 18 as it is part of our religious practices (PB14)	-0.011	0.776*	0.129*
37.	Girls should marry under 18 to respect our traditions/culture (PB15)	0.005	0.796*	0.054*

Factor Correlations			
Factor 1: Social Norms	1		
Factor 2: Personal Beliefs	0.229*	1	
Factor 3: Economic	0.077*	0.305*	1

*Note: * = effects are statistically significant (p < .05).*

Table 5. *Standardised Factors Loadings for the Child Marriage Acceptability Index (CFA Sample, N = 3502)*

Factor Loadings		Social Norms	Personal Beliefs	Economic
1.	Think that a girl marrying under 18 is preferable because younger brides are more obedient and respectful of their husbands (SN1)	0.764		
2.	Think that marrying a girl under 18 protects her from pre-marital sex (SN2)	0.761		
3.	Expect girls to be married before the age of 18 (SN5)	0.768		
4.	Think that a girl marrying under 18 will ensure that she gets a good groom (SN6)	0.832		
5.	Think that marrying a girl under 18 protects her family's honour and reputation (SN7)	0.841		
6.	Think that marrying a girl under 18 resolves family disputes (SN8)	0.781		
7.	Think that it is acceptable for a girl to marry under 18 if she is in love (SN9)	0.612		
8.	Expect girls under 18 to agree with marriage decisions that are made by others (SN10)	0.775		
9.	Think that marrying a girl under 18 protects her from sexual violence and sexual harassment (SN11)	0.812		
10.	Think that a married girl under 18 will give birth to healthier babies than girls who marry later (SN14)	0.719		
11.	Think that girls should marry under 18 as it is part of our religious practices (SN15)	0.735		
12.	Think that girls should marry under 18 to respect our traditions/culture (SN16)	0.752		
13.	To solve financial problems of the family (EE3)			0.967
14.	To marry under 18 to give her financial security (EE4)			0.957
15.	To reduce the poverty of her family (EE5)			0.968
16.	A girl marrying under 18 is preferable because younger brides are more obedient and respectful of their husbands (PB1)		0.780	
17.	Marrying a girl under 18 protects her from pre-marital sex (PB2)		0.765	
18.	A girl marrying under 18 is acceptable because she does not need secondary education (PB3)		0.820	
19.	A girl marrying under 18 is acceptable as only the husband needs to work in the future (PB4)		0.848	

20.	A girl marrying under 18 will ensure that she gets a good groom (PB5)		0.844	
21.	Even if a girl does not want to be married she should honour the decisions/ wishes of her family (PB6)		0.723	
22.	Marrying a girl under 18 protects her family's honour and reputation (PB7)		0.868	
23.	Marrying a girl under 18 resolves family disputes (PB8)		0.797	
24.	It is acceptable for a girl to marry under 18 if she is in love (PB9)		0.699	
25.	Marrying a girl under 18 protects her from sexual violence and sexual harassment (PB10)		0.803	
26.	A married girl under 18 will give birth to healthier babies than girls who marry later (PB13)		0.803	
27.	Girls should marry under 18 as it is part of our religious practices (PB14)		0.832	
28.	Girls should marry under 18 to respect our traditions/culture (PB15)		0.823	
Factor Correlations				
Factor 1: Social Norms		1		
Factor 2: Personal Beliefs		0.246*	1	
Factor 3: Economic		0.102*	0.408*	1

*Note: * = effects are statistically significant (p < .05)*

Multiple Linear Regression

Average child marriage acceptability scores were then calculated, with lower scores indicating greater unacceptability and higher scores indicating greater acceptability of child marriage[2]. Child marriage acceptability scores were, on average, highest in Indonesia (2.37), followed by Ethiopia (2.11), Kenya (1.73), Zambia (1.90), and Malawi (1.69) (Table 6). This pattern is consistent when disaggregated by gender and by marital status, with differences emerging when disaggregated by district (see Supplementary Material 2).

Table 6. *CMAS scores per country*

Country	**Observations**	**Mean Score**	**SD**	**Min**	**Max**
Ethiopia	1586	2.11	0.49	1.00	4.32
Indonesia	1428	2.37	0.44	1.39	4.07

[2] For items with missing values, the score per observation was also considered to be missing

Kenya	1375	1.73	0.45	1.00	3.61
Malawi	1602	1.69	0.66	1.00	4.32
Zambia	796	1.90	0.62	1.00	4.57

Table 7 summarises the result of the regression models with 'age at first marriage', 'lowest minimum acceptable age of marriage for girls', and 'ideal age of marriage for girls' as three dependent variables. For each one-unit increase in the acceptability score, there is a statistically significant decrease in the reported age of first marriage by 0.21 years, in the reported lowest minimum acceptable age of marriage by 0.35 years, and in the reported ideal age of marriage by 0.40 years, controlling for gender, country and age.

Table 7. *Regression results*

VARIABLES	Age of first marriage	Lowest Minimum acceptable age of marriage for girls	Ideal age for marriage of girls
CMAS Score	-0.211***	-0.351***	-0.406***
	(0.0536)	(0.0566)	(0.0537)
Gender/Sex			
Male	0.867***	0.103	-0.327***
	(0.115)	(0.0677)	(0.0661)
Country			
Indonesia	0.865***	3.425***	4.117***
	(0.142)	(0.0911)	(0.0679)
Kenya	0.803***	3.018***	4.111***
	(0.149)	(0.113)	(0.109)
Malawi	0.363***	1.097***	1.437***
	(0.136)	(0.0951)	(0.0725)
Zambia	0.943***	1.495***	2.809***
	(0.160)	(0.108)	(0.0928)

Age	0.150***	0.0197*	-0.00199
	(0.0199)	(0.0111)	(0.0111)
Married as a child	-3.157***	-0.522***	-0.666***
	(0.0688)	(0.113)	(0.0976)
n =	1,745	6,784	6,784
R-squared	0.623	0.226	0.338

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Validating the scale with insights from the qualitative data

The finding that child marriage acceptability was highest in Indonesia and Ethiopia was corroborated by the qualitative data. Key themes and examples of quotes demonstrating child marriage acceptability and shifts in acceptability per country can be found in Supplementary Material 3. In Indonesia, the *merariq* custom (marriage by elopement) and *siri* marriage (Islamic marriage) sanctioned child marriage. The fear of pre-marital sex prompted some families to marry their daughters early. In Ethiopia, the fear of out-of-wedlock pregnancies, the subsequent need to protect the girl's and family's honour, and the desire for bride price made child marriage an acceptable practice among community members.

In Malawi and Zambia, which had the lowest acceptability scores, participants expressed greater concern about teenage pregnancy than child marriage. There is some evidence that school re-entry was starting to be prioritised as a solution to pregnancy instead of child marriage, mainly due to new community by-laws. Child marriage was considered acceptable for reasons of poverty, school drop-out, lack of economic prospects and teenage pregnancy. Increasingly, gatekeepers did not push girls to marry if they were pregnant, unlike in Indonesia and Ethiopia.

In Kenya, there was peer pressure to marry young, especially for out-of-school youth. Being pregnant and in a few cases undergoing female genital mutilation/cutting (FGM/C) as an initiation rite into womanhood justified child marriage at the individual and community level. Traditional leaders as custodians of culture, often accepted child marriage, but some leaders were gradually taking a neutral position. This gradual shift among traditional and religious leaders was taking root in all countries. Across all countries, most youth and

community members supported child marriage prevention and many were involved in the same.

While it was not captured in the scale, qualitative findings show that, in Malawi and Zambia especially, child marriage was an acceptable solution to pregnancy. This was also closely linked to school drop-out and was prevalent in Kenya to some extent. Although questions regarding economic security are present in the CMAS, the role of education vis-à-vis child marriage did not emerge. This aligns with qualitative findings as well, particularly in Malawi and Zambia.

Discussion

Building on lessons learned from previous unvalidated measures, such as the CMAI developed by Plan International, and the Early Marriage Acceptability Scale (30,31), both developed for Asian contexts, we sought to develop and validate the Child Marriage Acceptability Scale (CMAS) for global use. Easy to administer, and available in multiple languages, the CMAS is a 28-item measure of child marriage acceptability, capturing personal beliefs, social norms, and economic aspects. Developed and validated across five countries using a hybrid approach, initial psychometric testing demonstrated strong properties, with evidence of a three-factor structure, good factorial validity and high external validity. Consistent with our hypotheses, CMAS scores were significantly and inversely related with 'age at first marriage', 'lowest minimum acceptable age of marriage for girls', and 'ideal age of marriage for girls'. Qualitative findings confirmed the CMAS scores. The key reasons that make child marriage acceptable included the role of tradition and religion, poor economic conditions, unequal gender roles, protection of family honour, fear of pre-marital sex, fear of pregnancy, fertility and lack of agency and decision-making power (8–10,12,30,32). These factors are addressed in the CMAS items and while we tested the CMAS in five countries to support global use, different factors may emerge depending on the context. For instance, child marriage as a response to pregnancy strongly emerged as a qualitative finding in Malawi and Zambia, while this was not or less the case in Ethiopia, Indonesia and Kenya.

The CMAS contributes to the growing field of social norms measurement. In recognition of legitimate epistemological and methodological concerns regarding social norm measurement (16,33), the CMAS represents a practical tool that could be used alongside context-specific, qualitative approaches to understand whether, and if so, how child marriage acceptability changes over time. The CMAS can support governments and development partners to develop and monitor interventions aiming to reduce child marriage, as part of broader social protection and health programmes (34). Measuring changes in acceptability may require longer measurement intervals (i.e. 5 years or longer) as

social and norm change is a long and fragile process (16,35)(32). Again, complementary qualitative research could nuance how this change occurs and could capture accompanying aspects such community backlash (16). Future research could employ the CMAS in conflict settings, where wars both erode and reinforce norms and where research on norms and child marriage remains limited (16,32).

This study has several limitations. First, the scale was only tested among young people (15-24 years), and is yet to be validated with other actors such as caregivers, community and religious leaders, who play a key role in shaping and maintaining norms. Although we triangulated scale scores with qualitative data which captured community members' perspectives, future validation with diverse respondent groups is needed. Second, the cross-sectional design limits our ability to ascertain predictive validity of the CMAS and the scale's longitudinal use would strengthen its utility (Morgado et al. 2018). Third, a potential method effect may have influenced the factor structure, as the three distinct question formats aligned with the three-factor solution (36). Fourth, though the household survey was informed by literature and data collected in 2016 (*Yes I Do* baseline), the final items comprising the CMAS were not directly validated by the target populations (37). It is worth noting that we opted for an unweighted mean to ensure ease of use and because only three items (related to economic aspects) had higher response ranges. The difference between weighted and unweighted scores was likely minimal (38).

Conclusion

The CMAS is a 28-item, validated instrument to measure acceptability of girl child marriage, focusing on personal beliefs, social norms and economic aspects. Developed using a mixed-methods approach, and tested in five countries, the scale demonstrates good initial psychometric properties. The scale is recommended for use by researchers, programmers and policymakers to monitor child marriage acceptability over time, thereby contributing to our growing understanding of what drives child marriage and how to address it globally.

Declarations

Ethics approval and consent to participate

Ethical approval was granted by the KIT Royal Tropical Institute Research Ethics Committee (proposal S69); the Ethical Review Committee of the Amhara Region Public Health Institute in Ethiopia, the Research Ethics Commission of Unika Atmajaya Jakarta in Indonesia, the African Medical and Research Foundation (AMREF) Ethics and Research Committee in Kenya, National Health Sciences Research Committee and University of Malawi Research Ethics Committee in Malawi, and the ERES Converge Institutional Review Board and the National Health Research Authority in Zambia. In each study site, permissions were also sought at the local level (for instance from traditional leaders). The study was conducted in line with the ethical principles of the Declaration of Helsinki. All participants gave informed consent.

Parental or caregiver consent was obtained for participants under 18 years of age, and under 16 years of age – in the case of Zambia.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request and upon permission of KIT Institute.

Authors' contributions

TK and MK conceptualized the study. MK and TK coordinated the data collection alongside researchers in each country. TK conducted data management. TK and FV conducted the quantitative data analysis while TK and MK conducted the qualitative data analysis. All authors were involved in the writing. TK prepared the manuscript, with substantial input and contributions from FV and MK. MK secured the funding. All authors reviewed and approved the final version of the manuscript.

Competing interests

The authors declare that there were no competing interests.

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