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Adaptation and validation of social accountability measures in the context of contraceptive services in Ghana and Tanzania

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Abstract

Background: Changes in the values, attitudes, and interactions of both service users and health care providers are central to social accountability processes in reproductive health. However, there is little consensus on how best to measure these latent changes. This paper reports on the adaptation and validation of measures that capture these changes in Tanzania and Ghana.

Methods: The CaPSAI theory of change determined the dimensions of the measure, and we adapted existing items for the survey items. Trained data collectors used a survey to collect data from 752 women in Tanzania and 750 women in Ghana attending contraceptive services. We used reliability analysis, exploratory, and confirmatory factor analysis to assess the validity and reliability of these measures in each country.

Results: The measure has high construct validity and reliability in both countries. We identified several subscales in both countries, 10 subscales in Tanzania, and 11 subscales in Ghana. Many of the domains and items were shared across both settings.

Conclusion: The study suggests that the multi-dimensional scales have high construct validity and reliability in both countries. Though there were differences in the two country contexts and in items and scales, there was convergence in the analysis that suggests that this measure may be relevant in different settings and should be validated in new settings.

Trial registration: [ACTRN12619000378123](https://www.anzctr.org.au/Trial/Registration/Trial.asp?id=36113).

Keywords: Social accountability, Measurement, Contraception, Tanzania, Ghana

Background

Considerable progress has been made in increasing women's access to modern contraception [35]. Nevertheless, there is continuing unmet need, particularly for those with less education, lower incomes, and younger age, and high rates of discontinuation due to poor

quality of care and negative patient experience [10, 35, 39]. In recent years, there have been renewed efforts to understand better and address issues surrounding the quality of care and clients' experiences of contraceptive services. Studies have identified a range of quality care issues that negatively affect clients' experiences of interacting with contraceptive services [3, 17, 25].

Community engagement and more patient-centred care have come to the forefront as essential mechanisms

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to address issues around quality of care and poor client experience [24, 40]. Evidence increasingly indicates the positive effects of social accountability on improving the quality of care and experience in other health sectors and concerning contraception specifically [5, 13, 38]. We define social accountability as “citizens’ efforts at ongoing meaningful collective engagement with public institutions for accountability in the provision of public goods.” ([18], pg 161). It is often best recognized through the tools used to facilitate the process, such as community scorecards, social audits, and participatory budget. As a potentially transformative change process, social accountability transforms the norms, values, and attitudes of those seeking services and those providing them, which together can bring about changes in the health system delivery and, in the longer term, population health outcomes. However, the all-important changes in service users and providers’ norms, values, and attitudes are often not measured, possibly because they are not observable but rather latent and multi-dimensional.

Though few validated measures aim to capture these variables, a notable exception is CARE’s Women’s Voice tool that provides an important starting point for researchers in this area [34]. As part of a more extensive complex intervention study [36], we adapted and validated measures of service users’ attitudes and behaviors in a social accountability process to improve family planning services. In this paper, we describe the process of adapting the measures and assessing their validity and reliability in Ghana and Tanzania.

Methods

The larger study’s theory of change about how service users’ attitudes changed during the social accountability process determined the dimensions of the measures. To develop the survey items, we adapted existing items. Trained data collectors used a survey to collect data from women attending contraceptive services in Tanzania and Ghana. We used reliability analysis, exploratory, and confirmatory factor analysis to assess the validity and reliability of these measures in each country.

The development of these measures is part of a more extensive complex intervention study, Community and Provider Social Accountability Intervention (CaPSAI), undertaken in Tanzania and Ghana [36]. These countries were selected based on the following criteria: (1) existence of a national civil society organization (CSO) partner with experience in social accountability, (2) low modern contraceptive prevalence rate, (3) availability of contraceptive services at the point of contact where cost is not a barrier to access, (4) an enabling environment in terms of the potential for the health system to respond to the social accountability, and (5) the existence of

formal structures linking the community with the health system (e.g. health committees).

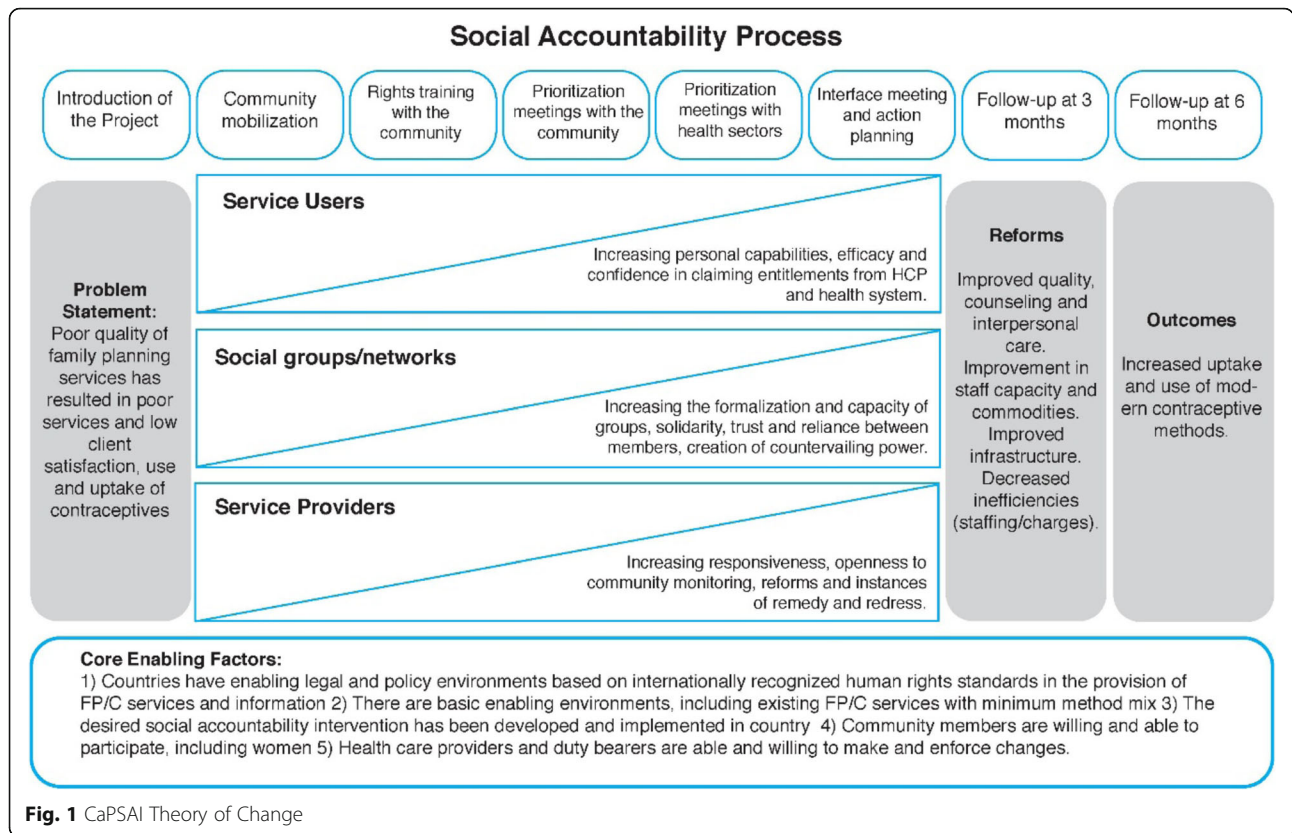
The study took place in Mbeya City and Chunya districts in Tanzania, and Abura-Asebu-Kwamankese, Komenda-Edna-Eguafo-Abirem, and Mfantiman districts in Ghana. The sites were selected based on (1) the provision of contraceptive services; (2) availability of the following methods: a barrier method, a short and long-acting method, emergency contraception, and at least referral for permanent methods in districts; and (3) no social accountability interventions in FP/C currently underway [36] Table 1.

Dimensions of the measure

The theory of change drew on existing empirical and theoretical work on social accountability more broadly and specifically related to sexual and reproductive health (see [7, 8, 36]). This informed the dimensions in the measure. The theory of change, Fig. 1, details the inputs of the social accountability process (across the top of the diagram), how these correspond to the cumulative intermediate outcomes at three levels: (1) service users, (2) social networks and (3) service providers, which in turn, effect intended reforms in the quality of care that contribute to contraceptive choice, including increased uptake and use of modern contraceptive methods. As detailed in elsewhere, social accountability engages community members and health services actors in dialogues to identify shared challenges and develop action plans that can lead to improvements in service quality in the health system and in at the individual level, the service user or potential user knowledge and engagement with the health system, both in terms of their own health seeking behaviour and their participation in dialogues with authorities [36].

Item adaptation and development

Following the development of the dimensions, we identified existing validated measures for each domain. We drew heavily on CARE’s Women VOICES tool, a validated measure the aimed to capture similar intermediate outcomes concerning maternal health in Malawi [34]. We added three domains to those used in the VOICES tool to represent the CaPSAI theory of change fully. First was the ‘Knowledge and awareness of rights’ domain that aimed to capture the service user’s perception of rights were also included [42]. For service users’ efficacy with health care providers, we used the National Health Service (NHS) measure of patient activation [28]. To capture changes in service user’s awareness of how to bring about changes and improve their local services, we created items based on theoretical work on political capabilities [22, 41]. We adapted five VOICES validated scales with acceptable reliability to the contraceptive



services and local context; for example, family planning services have a charge in Ghana but not in Tanzania. A total of 14 domains were included with 75 items (see Tables 2 and 3). A five-point Likert scale was used for all the item with the exception of two sets of items had different ranges in their original format. A 6 point scale was used for Self-efficacy with health care providers (set A) ‘Women’s participation in household decision- making’ and a dichotomous scale was used for ‘Self-efficacy with health care providers (set A)’ as originally used [28, 34].

We ascertained content validity of the overall items through consultation with experts in social accountability and family planning, and the Principal Investigators who reviewed the questionnaire. Also, the World Health Organization (WHO) Forms Committee, which was

Table 1 Characteristics of the study settings [36]

Type of facilities	Ghana (n = 8)	Tanzania (n = 8)
District Hospital	1	0
Health Centre /Clinic	6	2
Health Post (Community-based Health Planning Services - Ghana)	1	Not Applicable
Dispensary (Tanzania)	Not Applicable	6

Table 2 Domains identified based on Theory of Change

Domains	Number of Items
Knowledge and awareness of rights ^c	8 ^b
Women’s participation in household decision- making ^a	10 ^b
Self-efficacy with health care providers ^c	13 ^b
Self-efficacy for participation at community meetings ^a	6 ^b
Perception of service quality ^a	6 ^b
Political capabilities ^c	5 ^b
Collective efficacy ^a	4 ^b
Community support in time of crisis ^a	4 ^b
Mutual responsibility for and support of services ^a	5 ^b
Participation in negotiated spaces ^a	4
Joint monitoring and accountability of services ^a	2
Transparency ^a	3
Equity of negotiated spaces ^a	3
Quality of negotiated spaces ^a	3

^avalidated from CARE’s Women VOICES Tool

^bscales tested in this study

^cnew scales

Table 3 List of items included, per domain

Domain	Likert Range	No.	Item
Knowledge and awareness of rights	1–5	38	A healthcare provider can refuse to provide me family planning services because of who I am.
		39	The government ensures that family planning services are free of cost (Tanzania) or The government ensures that family planning methods are free of cost (Ghana)
		40	I have the right to privacy during my family planning visit. ^a
		41	The healthcare provider should not share my information with other people.
		42	If I am unhappy with the care I received, I know there are ways to make a complaint. ^a
		43	Healthcare providers must answer all my health-related questions. ^a
		44	Healthcare providers should inform me about the different family planning options ^a
		45	I can refuse any family planning method offered if I do not want to use it. ^a
Women's participation in household decision- making	1–6	46	First, would you tell me which member of your household usually makes decisions about your health care? ^a
		47	Which member of your household usually makes decisions about making large household purchases? ^a
		48	Which member of your household usually makes decisions about making household purchases for daily needs? ^a
		49	Which member of your household usually makes decisions about when you will visit family/relatives/friends? ^a
		50	Which member of your household usually makes decisions about when your whole household will visit family/relatives/friends? ^a
		51	Which member of your household usually makes decisions about how to use the money that you bring into the household? ^a
		52	Which member of your household usually makes decisions about how to use the money your husband/partner brings into the household? ^a
		53	Which member of your household usually makes decisions about whether you or you and your husband/partner use family planning? ^a
		54	Which member of your household usually makes decisions about where you will receive family planning? ^a
		55	Which member of your household usually makes decisions about if you will be tested for the AIDS virus? ^a
		56	Which member of your household usually makes decisions about how many children you will have? ^a
Self-efficacy with health care providers A	1–2	57	After your consultation with the health care provider today, do you know what your reproductive and family planning options are? ^a
		58	After your consultation with the health care provider today, do you feel that you can act on your choice for family planning? ^a
		59	Do you know what help you need to make a decision? ^a
Self-efficacy with health care providers B	1–5	65	I felt like I could discuss my problems, question and concerns with the health care provider without feeling embarrassed.
		66	One of the providers or staff refused to offer me the service I wanted to receive. (reverse-coded) ^a
		67	The provider ignored my request or my preferences today. ^a
		68	I felt like the provider did not listen to what I was saying (reverse-coded) ^a
		69	A provider strongly encouraged me to use one family planning that was different to the one I wanted (reverse-coded) ^a
		70	I have the right to choose my family planning method.
Self-efficacy for participation at community meetings	1–5	71	How sure are you that you could attend a community meeting if your family did not support you to participate? ^a
		72	How sure are you that you could attend a community meeting if your family said you could not go? ^a
		73	How sure are you that you could attend a community meeting if your family would not help with your household duties so that you could attend? ^a

Table 3 List of items included, per domain (Continued)

Domain	Likert Range	No.	Item
Perception of service quality	1–5	74	How sure are you that you could express your opinion at a community meeting? ^a
		75	How sure are you that you could express your opinion at a community meeting if a few people did not agree with what you were saying? ^a
		76	How sure are you that you could express your opinion at a community meeting if many people did not agree with what you were saying? ^a
		77	The staff at this health facility have high quality family planning services ^a
		78	The staff at this health facility ensures privacy and confidentiality when providing services. ^a
		79	The health facility is clean. ^a
		80	At this health facility, if women choose, they can bring their husband/partner for the family planning consultation. ^a
		81	At this health facility, if women choose, they can bring a family member or friend for the family planning consultation. ^a
Political capabilities	1–5	82	Unmarried women can access family planning and reproductive health service at the health facility.
		83	Today, if I went to the clinic, I believe I could get family planning I wanted without facing any barriers of cost, age and marital status.
		84	Anyone outside of the clinic, like friends or community members, can help you access your right to quality family planning services.
		85	Health providers and district government officials can directly influence the quality of your local family planning services? ^a
		86	Challenging people of influence is the best way to change family planning services in the clinic. ^a
		87	Collaboration with people of influence is the best way to change family planning services in the clinic. ^a
		Collective efficacy	1–5	88	How sure are you that the people in your community could work together to improve family planning services in this community? ^{a}
89	How sure are you that the people in your community could work together to improve how women are treated at the health facility? ^a		
90	How sure are you that the people in your community could work together to obtain government services and entitlements? ^a		
91	How sure are you that the people in your community could work together to improve the health and well- being of women in this community? ^a		
Community support in time of crisis	1–5	92	How sure are you that there is someone in your community, apart from your immediate family, who you could go to for advice? ^a
		93	How sure are you that there is someone in your community, apart from your immediate family, who could take you to the clinic? ^a
		94	How sure are you that there is someone in your community, apart from your immediate family, who would help care for your children or household while you are away? ^a
		95	How sure are you that there is someone in your community, apart from your immediate family, who would loan you money for transport? ^a
Mutual responsibility for and support of services	1–5	99	Who could have the most impact on making sure that women are treated with respect by health workers? ^a
		100	Who could have the most impact on making sure that women have transportation to the hospital for permanent methods of contraception? ^a
		101	Who could have the most impact on increasing the number of days a health worker visits your community? ^a
		102	Who could have the most impact on making sure the poorest and most vulnerable women in the community receive care? ^a
		103	Who could have the most impact on getting funding to improve health services in this community? ^a

^(a) retained from [34]

composed of technical experts in contraception, social scientists, biostatisticians, and data managers, reviewed the instruments.

Survey administration

English surveys were available in both countries and translated in Akan in Ghana and into Kiswahili in Tanzania. Back translation was within a normal range, and pretesting the questionnaire was satisfactory for use in the study populations.

The same eligibility criteria for participants were used in both sites (see [36]). A sample of over 750 women aged 15 to 49 years accessing contraceptive services was interviewed prior to the start of the intervention in each country. Sampling was calculated using a priori sample size calculation with the ratio of 10 responses per item ratio and guidance of more than 500, which equals a very good sample for validation [4, 34]. Our sample calculation was based on 75 items of the full survey of items, including post test items. The same items were administered as part of a client exit interview survey in

Table 4 Demographic Characteristics of Ghana and Tanzania Sample

	Ghana n (%)	Tanzania n (%)
Age, years		
Mean (SD) [Min, Max]	28.4 (7.1) [15, 49]	27.8 (6.3) [16., 47]
Median (IQR)	27 (23, 33)	27 (23, 32)
≤ 20	94 (12.5)	83 (11.1)
20–39	636 (70.1)	567 (75.6)
> 39	130 (17.4)	100 (13.3)
Marital status		
Currently married	476 (63.5)	636 (84.8)
Never married	225 (30.0)	77 (10.3)
Other (<i>Cohabitation, Fiance, no husband, separated, divorced</i>)	49 (6.5)	37 (4.9)
Methods currently using (among those using)		
Female sterilization	7 (1.1%)	11 (1.5%)
Male sterilization	2 (0.3)	3 (0.4)
IUD	8 (1.3)	40 (5.5)
Injectables	456 (71.7)	391 (53.7)
Implants	128 (20.1)	217 (29.8)
Pill	32 (5.0)	122 (16.8)
Male condom	17 (2.7)	53 (7.3)
Female condom	5 (0.8)	9 (1.2)
Emergency contraception	11 (1.7)	1 (0.1)
Standard days method	7 (1.1)	24 (3.3)
Lactational amenorrhea method	6 (0.9)	27 (3.7)
Other (Rhythm method/ withdrawal)	22 (3.4)	73 (10.1)
Highest level of school completed		
No formal schooling	131 (17.5)	29 (3.9)
Some primary school	243 (32.4)	48 (6.4)
Completed primary school	194 (25.9)	423 (56.4)
Some secondary school (some and completed)	109 (14.5)	222 (29.6)
Any tertiary education	73 (9.7)	28 (3.7)
Reading level		
Cannot read at all	303 (40.4)	34 (4.5)
Able to read only part of the sentence	187 (24.9)	105 (14.0)
Able to read whole sentence	259 (34.5)	611 (81.5)

Table 5 Reliability Analysis in Tanzania

Qn #	Scale mean if item deleted	Scale Standard Deviation	Variance	Item total Correlation with Total	Alpha if item deleted
Knowledge and Awareness of Rights					
38*	2.71	1.42	2.01	-0.17	0.83
39	1.46	0.61	0.37	0.55	0.72
40	1.61	0.65	0.42	0.58	0.71
41	1.63	0.70	0.49	0.55	0.72
42	2.24	1.26	1.58	0.47	0.73
43	1.64	0.60	0.36	0.62	0.70
44	1.62	0.59	0.34	0.67	0.69
45	1.78	1.02	1.04	0.49	0.73
Reliability Coefficients	Alpha = 0.83			N of cases 752	N of items: 7
Women's participation in household decision-making (all items)					
46†	1.60	0.49	0.24	0.51	0.88
47†	1.41	0.49	0.24	0.48	0.88
48†	1.69	0.46	0.21	0.56	0.88
49†	1.64	0.48	0.23	0.66	0.87
50†	1.62	0.48	0.23	0.65	0.87
51†	1.72	0.45	0.20	0.67	0.87
52†	1.63	0.48	0.23	0.51	0.88
53†	1.81	0.39	0.15	0.68	0.87
54†	1.84	0.36	0.13	0.69	0.87
55†	1.82	0.38	0.15	0.62	0.87
56†	1.76	0.43	0.18	0.56	0.88
Reliability Coefficients	Alpha = 0.83			N of cases 752	N of items: 10
Self efficacy with health care providers (Qn 57, 58 & 59)					
57**	0.94	0.23	0.05	0.43	0.43
58**	0.95	0.22	0.05	0.51	0.31
59**	0.76	0.43	0.18	0.26	0.68
Reliability Coefficients	Alpha = 0.59			N of cases 752	N of items: 2
Self efficacy with health care providers (all items)					
65	2.67	1.38	1.89	-0.16	0.74
66*	1.95	0.90	0.81	0.55	0.46
67*	1.82	0.81	0.66	0.58	0.45
68*	1.89	0.86	0.74	0.53	0.47
69*	2.03	1.02	1.04	0.48	0.50
70	1.55	0.73	0.54	0.18	0.62
Reliability Coefficients	Alpha = 0.81			N of cases 752	N of items: 3
Self-efficacy for participation at community meetings (all items) (Qn 71–73)					
71	1.88	1.27	1.61	0.73	0.75

Table 5 Reliability Analysis in Tanzania (Continued)

Qn #	Scale mean if item deleted	Scale Standard Deviation	Variance	Item total Correlation with Total	Alpha if item deleted
72	2.05	1.31	1.72	0.80	0.69
73	2.06	1.26	1.59	0.60	0.88
Reliability Coefficients	Alpha = 0.88			N of cases 752	N of items:2
Self-efficacy for participation at community meetings (all items)					
74	2.02	1.30	1.69	0.65	0.93
75	2.49	1.42	2.02	0.85	0.76
76	2.63	1.49	2.22	0.81	0.78
Reliability Coefficients	Alpha = 0.88			N of cases 752	N of items: 2
Perception of service quality (all items)					
77	1.62	0.64	0.41	0.58	0.64
78	1.59	0.59	0.35	0.59	0.64
79	1.70	0.65	0.42	0.53	0.66
80	1.70	0.73	0.53	0.49	0.67
81	2.26	1.08	1.17	0.35	0.71
82	2.18	1.11	1.23	0.21	0.75
Reliability Coefficients	Alpha = 0.75			N of cases 752	N of items: 5
Political Capabilities					
83	1.99	1.10	1.21	0.06	0.79
84	2.60	1.25	1.57	0.44	0.65
85	1.93	0.85	0.72	0.52	0.61
86	2.10	1.03	1.06	0.66	0.55
87	2.09	1.03	1.05	0.65	0.55
Reliability Coefficients	Alpha = 0.81			N of cases 752	N of items:4
Collective efficacy (all items)					
88	1.91	1.23	1.51	0.67	0.85
89	1.91	1.13	1.28	0.79	0.80
90	1.80	1.06	1.12	0.71	0.83
91	1.86	1.10	1.21	0.70	0.84
Reliability Coefficients	Alpha = 0.87			N of cases 0751	N of items:4
Community support in time of crisis (all items)					
92	1.72	1.27	1.61	0.39	0.57
93	1.70	1.13	1.28	0.49	0.50
94	1.90	1.28	1.64	0.39	0.57
95	2.11	1.38	1.90	0.37	0.59
Reliability Coefficients	Alpha = 0.63			N of cases 752	N of items:3
Mutual responsibility for and support of services (all items)					
99¥	1.69	0.50	0.25	0.33	0.51
100¥	1.39	0.64	0.41	0.32	0.52

Table 5 Reliability Analysis in Tanzania (Continued)

Qn #	Scale mean if item deleted	Scale Standard Deviation	Variance	Item total Correlation with Total	Alpha if item deleted
101¥	1.36	0.55	0.30	0.44	0.45
102¥	1.51	0.53	0.28	0.39	0.48
103¥	1.27	0.47	0.22	0.19	0.59
Reliability Coefficients	Alpha = 0.60			N of cases 752	N of items:4

* Reverse coded
 ** Yes/No Response items
 † 2 Response items
 ¥ 3 Response items

Tanzania and Ghana. The item related to cost of service varied between the countries as there is a nominal fee charged in Ghana. In Tanzania, the item was ‘The government ensures that family planning services are free of cost’ and in Ghana it was ‘The government ensures that family planning methods are free of cost.’

A total of 118 questions were asked of respondents upon leaving a facility, and only 58 scale items and 9 domains were included in the following analysis. Five domains and 17 items were excluded from this analysis because they were not scales or were items that applied after the intervention had been implemented.

The other survey items included questions about demographics, reproductive and family planning history, relationship status, income, occupation, and religion.

Client exit interviews were conducted on the day of recruitment at the facility in a private location. In Ghana, a total of 15 data collectors (5 females and 10 males) were trained in the survey over 3-day training in April 2018. In Tanzania, a total of 14 data collectors (8 females and 6 males) were trained over in the survey over 5 days in March 2018. Data collection was conducted using a tablet-based questionnaire to capture real-time data using OpenClinica and was later uploaded onto a secure server. Data collection in Tanzania started on 26 March and was completed on 25 May 2018, and all respondents choose to be interviewed in Kiswahili. In Ghana, data collection started on 9 April 2018 and was completed on 4 June 2018, and 46.4% choose to be interviewed in English while 53.6% choose to be interviewed in Akan.

Having being assessed for eligibility, respondents completed the informed consent process. There were no incentives given to women and girls to participate in the study. However, study participants who agreed to participate were reimbursed for their travel cost, where it was permitted by country-specific ethical requirements. In Ghana, the research team supported the travel cost to the facility with five Ghana cedis (~ 1 US dollar) given

after the interview. In Tanzania, no reimbursements were given.

Psychometric analysis

We assessed the item and scale reliability followed by exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) for each country. We assessed the reliability of items and scales to test the internal consistency. The EFA aimed to identify the relationships among items and then group the items as part of a factor. CFA was conducted to confirm the theory behind the grouping of items.

We started with assessing reliability using the Cronbach’s alpha to determine item -to- item correlation (or homogeneity) of all 58 observed items and determined the overall alpha for each scale in each country. A Cronbach’s alpha of 0.60 was considered acceptable reliability and 0.70 or higher to be good reliability [16]. Items were removed, according to standard procedures, if the overall alpha improved substantially if an item was removed [23]. Scales with Cronbach’s alpha of ≥.60 were retained [34].

We conducted exploratory factor analysis (EFA) to determine how all 58 observed items clustered together and explore the underlying factor structure in each country. We computed the communality for each item, defined as the proportion of variance in the item attributable to common factors; and used a Kaiser-Meyer-Olkin (KMO) of Sampling Adequacy to assess the suitability of items for the factor analysis. Overall, and factors with KMO value >0.5, for factor analysis were considered suitable for factor analysis [19, 21]. To determine the factors, we used eigenvalues in accordance with the Kaiser Criterion [20]. We examined the eigenvalues and the scree plot of eigenvalues, and factors with Eigenvalues greater than 1.0 were retained [20].

We used a rotated factor analysis using the maximum likelihood estimation (MLE) with oblique oblimin

Table 6 Eigenvalues in Tanzania

Factor	Eigenvalue
1	23.23
2	20.77
3	15.40
4	8.16
5	6.97
6	4.35
7	3.96
8	2.99
9	2.38
10	1.87
11	1.69

Table 7 Factor loadings for Tanzania

XSU QN #	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9	FACTOR 10	FACTOR 11	FACTOR 12	Communality prop of variance in the item attributable to common factors)
XSU038	0.26
XSU039	.	52	.	.	.	.	.	.	.	.	.	.	0.40
XSU040	.	60	.	.	.	.	.	.	.	.	.	.	0.50
XSU041	.	65	.	.	.	.	.	.	.	.	.	.	0.43
XSU042	0.33
XSU043	.	71	.	.	.	.	.	.	.	.	.	.	0.59
XSU044	.	76	.	.	.	.	.	.	.	.	.	.	0.64
XSU045	0.52
XSU046	0.29
XSU047	0.27
XSU048	40	.	.	.	.	.	.	.	.	.	.	.	0.35
XSU051	45	.	.	.	.	.	.	.	.	.	.	.	0.48
XSU052	0.29
XSU053	74	.	.	.	.	.	.	.	.	.	.	.	0.62
XSU054	76	.	.	.	.	.	.	.	.	.	.	.	0.69
XSU055	72	.	.	.	.	.	.	.	.	.	.	.	0.64
XSU056	60	.	.	.	.	.	.	.	.	.	.	.	0.42
XSU049	97	.	.	.	.	.	.	.	0.89
XSU050	94	.	.	.	.	.	.	.	0.85
XSU057	65	0.43
XSU058	80	0.63
XSU059	0.21
XSU065	0.19
XSU066	.	.	.	81	.	.	.	.	.	.	.	.	0.65
XSU067	.	.	.	77	.	.	.	.	.	.	.	.	0.66
XSU068	.	.	.	70	.	.	.	.	.	.	.	.	0.54
XSU069	.	.	.	59	.	.	.	.	.	.	.	.	0.41
XSU070	0.26
XSU071	82	.	.	.	.	.	0.69
XSU072	97	.	.	.	.	.	0.92
XSU073	53	.	.	.	.	.	0.45
XSU074	61	.	.	.	.	.	.	0.49

rotation to determine the factor loadings and variance. Factor loadings assess how items are weighted for each factor and the correlation between the variables and the factor. We used the proportion of variance in the item explained by the factors jointly to assess the reliability of the item in the context of all the factors. Items with factor loadings with values less than 0.40 were excluded. A minimum of three items per factor is recommended, and factors with two items or less were excluded [26].

Confirmatory Factor Analysis (CFA) was done to confirm whether the constructs identified in EFA had a good fit statistically. We applied three recommended models to test for goodness-of-fit [32]. The Standardized Root Mean Square Residual (SRMR) is a measure of the mean absolute correlation residual with a threshold of ≤ 0.08 ; the Root Mean Square Error of Approximation (RMSEA) measures the estimated discrepancy between the population and model-implied population covariance matrices per degree of freedom, and a score of ≤ 0.06 is acceptable, and Comparative Fit Index (CFI) measures the relative improvement in the fit of a researcher’s model over that of a baseline model, and a $CFI \geq 0.95$ considered an acceptable fit [6]. The CFA structural model was presented for each country.

Results

Demographic characteristics

In total, 750 in Ghana, and 752 women in Tanzania completed the survey. This sample is based on 10 respondents per item to produce a reliable estimate [6]. Table 4 shows the demographic characteristics of respondents.

The mean age of the women that participated in the survey was 28.4 in Ghana and 27.8 in Tanzania. In Tanzania, 84.8% of women were currently married compared to 63.5% in Ghana. A higher percentage of women in Tanzania were never-married (30.0%) than Ghana

(10.3%). In both countries, injectable and implants were the predominant current contraceptive method.

Analysis

To assess the scales in Tanzania and Ghana, we conducted three sets of analyses to (1) assess the reliability of the subscales, (2) determine how many factors to retain and reduce the items, and (3) verify our proposed groupings separately per country.

Tanzania

We started with a reliability analysis using the Cronbach’s alpha to determine item -to -item correlation of all 58 observed items and determine the overall alpha for each subscales in Tanzania (see Table 5). The standardized alpha was greater than 0.60 (the acceptable reliability in social science research) for 6 of the 11 subscales and was retained. When the alpha was lesser than 0.70, items were removed if their removal improved the overall alpha scale. A total of 6 items were removed; this included questions 38, 65, 70, 82, 83, and 84. Subscales with Cronbach’s alpha of $\geq .60$ were retained.

We undertook a KMO measure of sampling adequacy, and all items had a KMO of 0.5. The overall KMO score was 0.85, suggesting that there is a sufficient correlation between the variables to conduct exploratory factor analysis.

The EFA used principal factors with oblique oblimin rotation for all 58 items that yielded 11 factors. All factors had eigenvalues greater than 1.0; see Table 6 (which explained 100% of the variance).

In total, five items loaded on factor 1, five items loaded on factor 2, four items loaded on to factor 3, four items loaded on to factor 4, two items loaded on to factor 5, three items loaded onto factor 6, three items loaded onto factor 7, three items loaded onto factor 8, three items loaded onto factor 9, three items loaded onto factor 10, and two items loaded onto factor 11 Table 7. We discarded items with

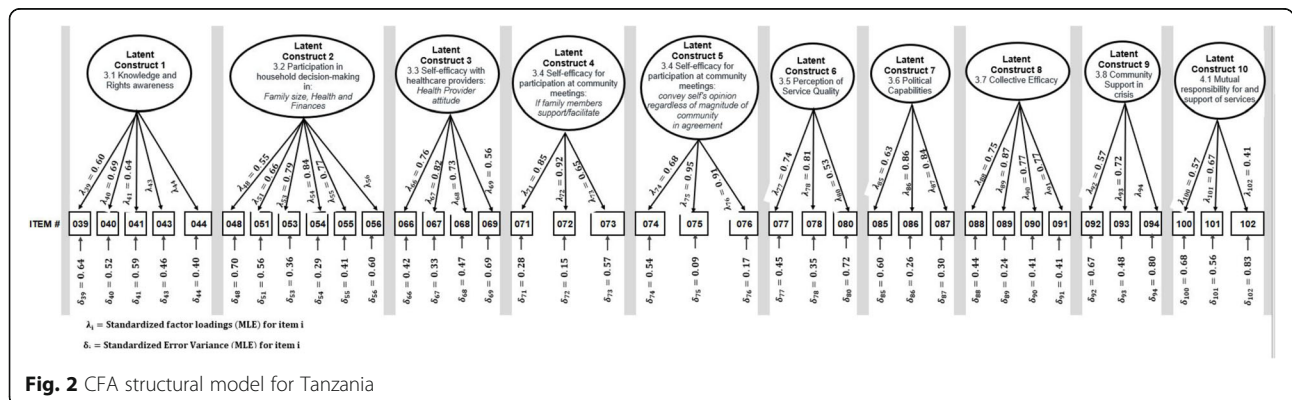


Fig. 2 CFA structural model for Tanzania

Table 8 Reliability Analysis in Ghana

Qn #	Scale mean if item deleted	Scale Standard Deviation	Variance	Item total Correlation with Total	Alpha if item deleted
Knowledge and Awareness of Rights					
38*	2.78	1.50	2.24	0.19	0.69
39	2.23	1.19	1.42	0.13	0.70
40	1.45	0.58	0.34	0.51	0.61
41	1.64	0.99	0.99	0.23	0.68
42	2.00	0.99	0.98	0.37	0.64
43	1.63	0.71	0.51	0.54	0.60
44	1.55	0.61	0.37	0.54	0.60
45	1.55	0.70	0.50	0.45	0.62
Reliability Coefficients		Alpha = 0.74		N of cases 750	N of items: 5
Women's participation in household decision-making (all items)					
46†	1.78	0.41	0.17	0.69	0.90
47†	1.75	0.44	0.19	0.69	0.90
48†	1.82	0.39	0.15	0.69	0.90
49†	1.81	0.39	0.15	0.69	0.90
50†	1.78	0.41	0.17	0.69	0.90
51†	1.82	0.38	0.15	0.69	0.90
52†	1.78	0.42	0.17	0.69	0.91
53†	1.87	0.33	0.11	0.69	0.91
54†	1.88	0.33	0.11	0.69	0.91
55†	1.88	0.33	0.11	0.69	0.91
56†	1.88	0.33	0.11	0.69	0.91
Reliability Coefficients		Alpha = 0.91		N of cases 750	N of items: 10
Self efficacy with health care providers (Qn 57, 58 & 59)					
57**	0.89	0.31	0.10	0.50	0.65
58**	0.96	1.20	1.44	0.64	0.46
59**	0.93	0.26	0.07	0.44	0.72
Reliability Coefficients		Alpha = 0.71		N of cases 750	N of items: 2
Self efficacy with health care providers (all items)					
65	1.82	0.98	0.96	-0.05	0.73
66*	2.13	1.14	1.29	0.48	0.54
67*	1.94	0.92	0.85	0.65	0.47
68*	1.95	0.89	0.80	0.54	0.52
69*	2.05	0.98	0.97	0.49	0.54
70	1.49	0.78	0.61	0.16	0.66
Reliability Coefficients		Alpha = 0.80		N of cases 750	N of items: 4
Self-efficacy for participation at community meetings (all items)(Qn 71–73)					
71	2.44	1.65	2.72	0.73	0.85
72	2.60	1.63	2.66	0.80	0.83
73	2.60	1.62	2.62	0.60	0.91
Reliability Coefficients		Alpha = 0.90		N of cases 750	N of items: 2
Self-efficacy for participation at community meetings (all items)					
74	1.67	1.15	1.32	0.52	0.86

Table 8 Reliability Analysis in Ghana (Continued)

Qn #	Scale mean if item deleted	Scale Standard Deviation	Variance	Item total Correlation with Total	Alpha if item deleted
75	2.07	1.33	1.77	0.76	0.61
76	2.35	1.45	2.10	0.69	0.70
Reliability Coefficients		Alpha = 0.81		N of cases 750	N of items: 2
Perception of service quality (all items)					
77	1.51	0.56	0.31	0.42	0.55
78	1.55	0.56	0.31	0.53	0.51
79	1.57	0.60	0.36	0.46	0.54
80	1.74	0.74	0.55	0.35	0.58
81	1.89	0.82	0.67	0.31	0.59
82	2.06	1.15	1.32	0.09	0.68
Reliability Coefficients		Alpha = 0.68		N of cases 750	N of items: 5
Political capabilities					
83	1.76	0.79	0.62	0.14	0.53
84	2.33	1.17	1.37	0.11	0.56
85	2.02	0.99	0.98	0.38	0.39
86	2.79	1.24	1.54	0.40	0.39
87	2.40	1.20	1.44	0.44	0.35
Reliability Coefficients		Alpha = 0.64		N of cases 750	N of items:3
Collective efficacy (all items)					
88	1.47	0.89	0.79	0.58	0.74
89	1.46	0.82	0.67	0.68	0.69
90	1.49	0.82	0.67	0.52	0.77
91	1.43	0.76	0.58	0.61	0.73
Reliability Coefficients		Alpha = 0.79		N of cases 750	N of items:4
Community support in time of crisis (all items)					
92	1.25	0.71	0.50	0.42	0.62
93	1.28	0.70	0.49	0.50	0.57
94	1.57	1.11	1.23	0.48	0.58
95	1.87	1.35	1.82	0.40	0.63
Reliability Coefficients		Alpha = 0.67		N of cases 750	N of items:3
Mutual responsibility for and support of services (all items)					
99¥	1.69	0.47	0.22	0.58	0.83
100¥	1.35	0.75	0.56	0.58	0.83
101¥	1.54	0.51	0.26	0.71	0.79
102¥	1.54	0.51	0.26	0.73	0.78
103¥	1.41	0.50	0.25	0.64	0.81
Reliability Coefficients		Alpha = 0.84		N of cases 750	N of items:4

* Reverse coded

** Yes/No Response items

† 2 Response items

¥ 3 Response items

factor loadings of less than 0.4, and 12 items were removed, see Table 7. Factors with less than two items were excluded as this is not a sufficient

number for factor analysis. On this basis, two factors were removed, and 10 factors were retained. A total of 40 items were retained.

To name the factors, we assessed what items were retained from the reliability analysis and the exploratory factor analysis and the original domain groupings. Factor 1 continues to reflect the domain items related to a client’s knowledge of their health rights and is named ‘Knowledge of health rights.’ The items included in factor 2 reflected knowledge of household decision-making in relation to finances and sexual and reproductive health and retained the name ‘Women’s participation in household decision-making’. The items included in factor 4 relate to clients’ perceived mistreatment by health care providers and is named ‘Mistreatment by health workers’. Items in factor 5 relate to the clients’ ability to attend a community meeting and are named ‘Ability to attend a community meeting.’ Factor 6 included items related to the ability to actively participate in a community meeting and is named ‘Ability to participate in a community meeting.’ Items in factor 7 relate to the client’s ‘Perception of quality’ and retain the name, ‘Perception of quality services’. The items in factor 8 relate to the understanding of how to bring about change in contraceptive clinics and are named ‘Awareness of accountability mechanisms.’ Factor 9 includes items that relate to the sense of social capital and cohesion and retains the name ‘Collective efficacy’. Factor 10 included items related to a sense of support from others during a crisis and retains the name ‘Community support in the time of crisis.’ For factor 11, the items related to how clients thought change could be achieved and retains the name ‘Mutual responsibility for and support of services’ (Fig. 2).

Ghana

We started with a reliability analysis using the Cronbach’s alpha to determine item -to- item correlation of all 58 observed items and determined the overall alpha for each subscales in Ghana (see Table 8). The standardized alpha was greater than 0.60 for 8 of the 11 subscales and was retained. When the alpha was lesser than 0.60, items were removed if their removal improved the overall alpha scale. A total of 8 items were removed; this included questions 38, 39, 41, 65, 70, 82, 83, and 84. Scales with Cronbach’s alpha of ≥ 0.60 were retained.

In the KMO measure of sampling adequacy, all items had a KMO of 0.5, and the overall KMO score was 0.80, suggesting that there is sufficient correlation between the variables to conduct exploratory factor analysis.

The EFA used principal factors with oblique oblimin rotation yielded 13 factors with eigenvalues greater than or equal to 1.0 (see Table 9).

The revised item data was used in the confirmatory factor analysis to analyze a good fit. The SRMR score of 0.05, the CFI score of 0.94, and the RMSEA score of

Table 9 Eigenvalues in Ghana

Factor	Eigenvalue
1	18.47
2	13.98
3	11.17
4	7.68
5	6.27
6	5.43
7	4.18
8	3.78
9	2.60
10	2.32
11	1.99
12	1.45
13	1.31

0.03 are good. All three score suggests acceptable goodness-of-fit.

In total, seven items loaded on factor 1, five items loaded on factor 2, three items loaded on to factor 3, four items loaded on to factor 4, four items loaded on to factor 5, five items loaded onto factor 6, three items loaded onto factor 7, three items loaded onto factor 8, three items loaded onto factor 9, four items loaded onto factor 10, four items loaded onto factor 11, two items on factor 12 and one item on factor 13 Table 10. Factors with less than two items were excluded as this is not sufficient for factor analysis, this reduced the number of factors from 13 to 10. We discarded items with factor loadings less than 0.4, and two items were removed, see Table 11. In total, 10 items were removed, and 48 items were retained.

Similar to Tanzania, to name the factors, we assessed what items were retained and the original domains. These corresponded with those found in Tanzania, with the exception of one factor that was dropped in Tanzania but retained in Ghana. The items included in this factor related to a clients’ sense of activation and are named ‘patient activation.’ There was also a difference in what items were retained in relation to household decision making; those pertaining to contraception were excluded, whereas those related to decisions over finances, over seeking health care, and visiting others were included (Fig. 3).

The revised item data was used in the confirmatory factor analysis to assess the goodness-of-fit. The SRMR score of 0.057, the CFI score of 0.88, and the RMSEA score of 0.04, all suggest an acceptable goodness-of-fit.

Table 10 Factor loadings for Ghana

XSU QN #	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9	FACTOR 10	FACTOR 11	FACTOR 12	FACTOR 13	Communality (prop of variance in the item attributable to common factors)
XSU038	.	.	.	.	.	.	.	.	.	.	.	.	.	0.36
XSU039	.	.	.	.	.	.	.	.	.	.	.	.	.	0.25
XSU040	.	.	.	.	.	41	.	.	.	.	.	.	.	0.33
XSU041	.	.	.	.	.	.	.	.	.	.	.	.	.	0.11
XSU042	.	.	.	.	.	52	.	.	.	.	.	.	.	0.29
XSU043	.	.	.	.	.	71	.	.	.	.	.	.	.	0.50
XSU044	.	.	.	.	.	65	.	.	.	.	.	.	.	0.46
XSU045	.	.	.	.	.	47	.	.	.	.	.	.	.	0.29
XSU046	59	.	.	.	.	.	.	.	.	.	.	.	.	0.54
XSU047	70	.	.	.	.	.	.	.	.	.	.	.	.	0.57
XSU048	78	.	.	.	.	.	.	.	.	.	.	.	.	0.64
XSU051	90	.	.	.	.	.	.	.	.	.	.	.	.	0.73
XSU052	80	.	.	.	.	.	.	.	.	.	.	.	.	0.65
XSU053	63	.	.	.	.	.	.	.	.	.	.	.	.	0.54
XSU054	56	.	.	.	.	.	.	.	.	.	.	.	.	0.43
XSU055	.	.	.	.	.	.	.	.	.	.	.	64	.	0.66
XSU056	.	.	.	.	.	.	.	.	.	.	.	69	.	0.68
XSU049	.	.	.	.	.	.	.	.	.	.	.	.	.	0.39
XSU050	43	.	.	.	.	.	.	.	.	.	.	.	.	0.41
XSU051	.	.	.	.	.	.	.	73	.	.	.	.	.	0.63
XSU058	.	.	.	.	.	.	.	82	.	.	.	.	.	0.66
XSU059	.	.	.	.	.	.	.	58	.	.	.	.	.	0.35
XSU065	.	.	.	.	.	.	.	.	.	.	.	.	.	0.13
XSU066	.	.	.	70	.	.	.	.	.	.	.	.	.	0.52
XSU067	.	.	.	84	.	.	.	.	.	.	.	.	.	0.71
XSU068	.	.	.	70	.	.	.	.	.	.	.	.	.	0.50
XSU069	.	.	.	60	.	.	.	.	.	.	.	.	.	0.43
XSU070	.	.	.	.	.	.	.	.	.	.	.	.	.	0.20
XSU071	.	.	90	.	.	.	.	.	.	.	.	.	.	0.83
XSU072	.	.	91	.	.	.	.	.	.	.	.	.	.	0.87
XSU073	.	.	72	.	.	.	.	.	.	.	.	.	.	0.65
XSU074	.	.	.	.	.	.	58	.	.	.	.	.	.	0.43

Table 11 Final items per country

Tanzania				Ghana			
No	Item	CFA Factor loading	Standard Error Variance	No	Item	CFA Factor loading	Standard Error Variance
Knowledge of Health Rights							
XSU038	A healthcare provider can refuse to provide me family planning services because of who I am. (reverse-coded)			XSU038	A healthcare provider can refuse to provide me family planning services because of who I am. (reverse-coded)		
XSU039	The government ensures that family planning methods (Ghana) or services (Tanzania) are free of cost.	0.6	0.64	XSU039	The government ensures that family planning methods (Ghana) or services (Tanzania) are free of cost.		
XSU040	I have the right to privacy during my family planning visit.	0.69	0.52	XSU040	I have the right to privacy during my family planning visit.	0.53	0.72
XSU041	The healthcare provider should not share my information with other people.	0.64	0.46	XSU041	The healthcare provider should not share my information with other people.	0.44	0.8
XSU042	If I am unhappy with the care I received, I know there are ways to make a complaint.			XSU042	If I am unhappy with the care I received, I know there are ways to make a complaint.	0.7	0.5
XSU043	Healthcare providers must answer all my health related questions.	0.73	0.46	XSU043	Healthcare providers must answer all my health related questions.	0.7	0.51
XSU044	Healthcare providers should inform me about the different family planning options.	0.77	0.4	XSU044	Healthcare providers should inform me about the different family planning options.	0.54	0.71
XSU045	I can refuse any family planning method offered if I do not want to use it.			XSU045	I can refuse any family planning method offered if I do not want to use it.		
Mistreatment by Health workers							
XSU065	I felt like I could discuss my problems, question and concerns with the health care provider without feeling embarrassed.			XSU065	I felt like I could discuss my problems, question and concerns with the health care provider without feeling embarrassed.		
XSU066	One of the providers or staff refused to offer me the service I wanted to receive. (reverse-coded)	0.76	0.42	XSU066	One of the providers or staff refused to offer me the service I wanted to receive. (reverse-coded)	0.71	0.5
XSU067	The provider ignored my request or my preferences today.	0.82	0.33	XSU067	The provider ignored my request or my preferences today.	0.86	0.26
XSU068	I felt like the provider did not listen to what I was saying (reverse-coded)	0.73	0.47	XSU068	I felt like the provider did not listen to what I was saying (reverse-coded)	0.66	0.56
XSU069	A provider strongly encouraged me to use one family planning that was different to the one I wanted (reverse-coded)	0.56	0.69	XSU069	A provider strongly encouraged me to use one family planning that was different to the one I wanted (reverse-coded)	0.6	0.64
XSU070	I have the right to choose my family planning method.			XSU070	I have the right to choose my family planning method.		
Perception of quality services							
XSU077	The staff at this health facility have high quality family planning services.	0.74	0.45	XSU077	The staff at this health facility have high quality family planning services.	0.62	0.61
XSU078	The staff at this health facility ensures privacy and confidentiality when providing services.	0.81	0.35	XSU078	The staff at this health facility ensures privacy and confidentiality when providing services.	0.81	0.35
XSU079	The health facility is clean.	0.53	0.73	XSU079	The health facility is clean.	0.57	0.68
XSU080	At this health facility, if women choose, they can bring their husband/partner for the family planning consultation.			XSU080	At this health facility, if women choose, they can bring their husband/partner for the family planning consultation.		
	At this health facility, if women choose,			XSU081	At this health facility, if women choose,		

Table 11 Final items per country (*Continued*)

Tanzania				Ghana			
No	Item	CFA Factor loading	Standard Error Variance	No	Item	CFA Factor loading	Standard Error Variance
XSU081	they can bring a family member or friend for the family planning consultation.				they can bring a family member or friend for the family planning consultation.		
XSU082	Unmarried women can access family planning and reproductive health service at the health facility.			XSU082	Unmarried women can access family planning and reproductive health service at the health facility.		
Women's participation in h/h decision-making							
XSU046	First, would you tell me which member of your household usually makes decisions about your health care?			XSU046	First, would you tell me which member of your household usually makes decisions about your health care?		0.49
XSU047	Which member of your household usually makes decisions about making large household purchases?			XSU047	Which member of your household usually makes decisions about making large household purchases?	0.75	0.44
XSU048	Which member of your household usually makes decisions about making household purchases for daily needs?	0.55	0.7	XSU048	Which member of your household usually makes decisions about making household purchases for daily needs?	0.8	0.36
XSU049	Which member of your household usually makes decisions about when you will visit family/relatives/friends?			XSU049	Which member of your household usually makes decisions about when you will visit family/relatives/friends?	0.83	0.32
XSU050	Which member of your household usually makes decisions about when your whole household will visit family/relatives/friends?			XSU050	Which member of your household usually makes decisions about when your whole household will visit family/relatives/friends?	0.74	0.45
XSU051	Which member of your household usually makes decisions about how to use the money that you bring into the household?	0.66	0.56	XSU051	Which member of your household usually makes decisions about how to use the money that you bring into the household?	0.73	0.47
XSU052	Which member of your household usually makes decisions about how to use the money your husband/partner brings into the household?			XSU052	Which member of your household usually makes decisions about how to use the money your husband/partner brings into the household?	0.64	0.59
XSU053	Which member of your household usually makes decisions about whether you or you and your husband/partner use family planning?	0.79	0.36	XSU053	Which member of your household usually makes decisions about whether you or you and your husband/partner use family planning?		
XSU054	Which member of your household usually makes decisions about where you will receive family planning?	0.84	0.29	XSU054	Which member of your household usually makes decisions about where you will receive family planning?		
XSU055	Which member of your household usually makes decisions about if you will be tested for the AIDS virus?	0.77	0.41	XSU055	Which member of your household usually makes decisions about if you will be tested for the AIDS virus?		
XSU056	Which member of your household usually makes decisions about how many children you will have?	0.63	0.6	XSU056	Which member of your household usually makes decisions about how many children you will have?	0.59	0.66
Self efficacy with health care providers							
XSU057	After your consultation with the health care provider today, do you know what your reproductive and family planning options are?			XSU057	After your consultation with the health care provider today, do you know what your reproductive and family planning options are?	0.73	0.47
XSU058	After your consultation with the health care provider today, do you feel that you can act on your choice for family planning?			XSU058	After your consultation with the health care provider today, do you feel that you can act on your choice for family planning?	0.87	0.24
XSU059	Do you know what help you need to make a decision?			XSU059	Do you know what help you need to make a decision?	0.54	0.71

Table 11 Final items per country (Continued)

Tanzania				Ghana			
No	Item	CFA Factor loading	Standard Error Variance	No	Item	CFA Factor loading	Standard Error Variance
Ability to attend community meetings							
XSU071	How sure are you that you could attend a community meeting if your family did not support you to participate?	0.85	0.28	XSU071	How sure are you that you could attend a community meeting if your family did not support you to participate?	0.88	0.21
XSU072	How sure are you that you could attend a community meeting if your family said you could not go?	0.92	0.15	XSU072	How sure are you that you could attend a community meeting if your family said you could not go?	0.93	0.14
XSU073	How sure are you that you could attend a community meeting if your family would not help with your household duties so that you could attend?	0.65	0.57	XSU073	How sure are you that you could attend a community meeting if your family would not help with your household duties so that you could attend?	0.79	0.38
Ability to participate in community meetings							
XSU074	How sure are you that you could express your opinion at a community meeting?	0.68	0.54	XSU074	How sure are you that you could express your opinion at a community meeting?	0.58	0.66
XSU075	How sure are you that you could express your opinion at a community meeting if a few people did not agree with what you were saying?	0.95	0.09	XSU075	How sure are you that you could express your opinion at a community meeting if a few people did not agree with what you were saying?	0.9	0.18
XSU076	How sure are you that you could express your opinion at a community meeting if many people did not agree with what you were saying?	0.91	0.17	XSU076	How sure are you that you could express your opinion at a community meeting if many people did not agree with what you were saying?	0.82	0.33
Awareness of accountability mechanisms							
XSU083	Today, if I went to the clinic I believe I could get family planning I wanted without facing any barriers of cost, age and marital status.			XSU083	Today, if I went to the clinic I believe I could get family planning I wanted without facing any barriers of cost, age and marital status.		
XSU084	Anyone outside of the clinic, like friends or community members, can help you access your right to quality family planning services.			XSU084	Anyone outside of the clinic, like friends or community members, can help you access your right to quality family planning services.		
XSU085	Health providers and district government officials can directly influence the quality of your local family planning services?	0.63	0.6	XSU085	Health providers and district government officials can directly influence the quality of your local family planning services?	0.52	0.73
XSU086	Challenging people of influence is the best way to change family planning services in the clinic.	0.86	0.26	XSU086	Challenging people of influence is the best way to change family planning services in the clinic.	0.48	0.77
XSU087	Collaboration with people of influence is the best way to change family planning services in the clinic.	0.84	0.84	XSU087	Collaboration with people of influence is the best way to change family planning services in the clinic.	0.96	0.08
Mutual responsibility for and support of services (all items)							
XSU099	Who could have the most impact on making sure that women are treated with respect by health workers?			XSU099	Who could have the most impact on making sure that women are treated with respect by health workers?	0.6	0.64
XSU100	Who could have the most impact on making sure that women have transportation to the hospital for permanent methods of contraception?	0.57	0.68	XSU100	Who could have the most impact on making sure that women have transportation to the hospital for permanent methods of contraception?	0.6	0.64
XSU101	Who could have the most impact on increasing the number of days a health worker visits your community?	0.67	0.56	XSU101	Who could have the most impact on increasing the number of days a health worker visits your community?	0.8	0.36

Table 11 Final items per country (Continued)

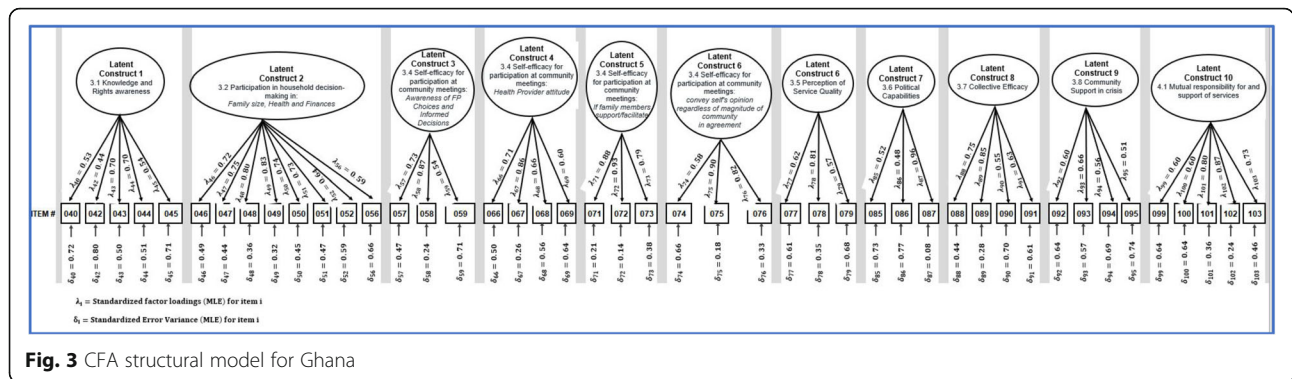
Tanzania				Ghana			
No	Item	CFA Factor loading	Standard Error Variance	No	Item	CFA Factor loading	Standard Error Variance
XSU102	Who could have the most impact on making sure the poorest and most vulnerable women in the community receive care?	0.41	0.83	XSU102	Who could have the most impact on making sure the poorest and most vulnerable women in the community receive care?	0.87	0.24
XSU103	Who could have the most impact on getting funding to improve health services in this community?			XSU103	Who could have the most impact on getting funding to improve health services in this community?	0.71	0.46
Collective efficacy							
XSU088	How sure are you that the people in your community could work together to improve family planning services in this community?	0.75	0.44	XSU088	How sure are you that the people in your community could work together to improve family planning services in this community?	0.75	0.44
XSU089	How sure are you that the people in your community could work together to improve how women are treated at the health facility?	0.87	0.24	XSU089	How sure are you that the people in your community could work together to improve how women are treated at the health facility?	0.85	0.28
XSU090	How sure are you that the people in your community could work together to obtain government services and entitlements?	0.77	0.41	XSU090	How sure are you that the people in your community could work together to obtain government services and entitlements?	0.55	0.7
XSU091	How sure are you that the people in your community could work together to improve the health and well-being of women in this community?	0.77	0.41	XSU091	How sure are you that the people in your community could work together to improve the health and well-being of women in this community?	0.63	0.61
Community Support in the time of crisis							
XSU092	How sure are you that there is someone in your community, apart from your immediate family, who you could go to for advice?			XSU092	How sure are you that there is someone in your community, apart from your immediate family, who you could go to for advice?	0.6	0.64
XSU093	How sure are you that there is someone in your community, apart from your immediate family, who could take you to the clinic?	0.57	0.67	XSU093	How sure are you that there is someone in your community, apart from your immediate family, who could take you to the clinic?	0.66	0.57
XSU094	How sure are you that there is someone in your community, apart from your immediate family, who would help care for your children or household while you are away?	0.72	0.48	XSU094	How sure are you that there is someone in your community, apart from your immediate family, who would help care for your children or household while you are away?	0.56	0.69
XSU095	How sure are you that there is someone in your community, apart from your immediate family, who would loan you money for transport?	0.44	0.8	XSU095	How sure are you that there is someone in your community, apart from your immediate family, who would loan you money for transport?	0.51	0.74

Discussion

We adapted and validated the measures of service users’ attitudes and behaviors in a social accountability process to improve contraceptive services in Ghana and Tanzania. The measure has high construct validity and reliability in both countries. We identified several subscales in both countries: 10 subscales in Tanzania and 11 subscales in Ghana. Many of the scales and items were shared across both settings, as shown in Table 11. There were some differences in how the scales performed in the different contexts; however, there was

convergence in the analysis to suggest that this measure may be relevant to other settings.

The first group of scales related to clients’ awareness about their health and contraceptive entitlements. This includes the following scales: knowledge of health rights, mistreatment by health workers, and perception of quality. While these scales are conceptually distinct constructs, when combined, they measure a critical aspect of clients’ knowledge of their rights and entitlements. In the social accountability canon, being aware of one’s health rights and entitlements is a critical precursor to



generating critical consciousness and people’s ability to participate in collective action [9, 12, 14, 29]. As George [12] reminds us, “Not only is access to information essential for improving health awareness and access, it is impossible to mobilise for change without it. People cannot demand services and accountability if they do not know what they need and what they are entitled to.”

Several of the scales related to capturing an individual’s perception of their ability to affect change are included: ‘Women’s participation in household decision-making’, ‘Self-efficacy with health care providers’, ‘Ability to attend community meetings’, and ‘Ability to participate in community meetings’. There was also a group of scales related to if clients knew how to improve their existing circumstance and included: ‘Mutual responsibility for and support of services’ and ‘Awareness of accountability mechanisms’. Many have scholars working in social accountability have argued that it is important the people see that change is possible, and they themselves are agents of change [9, 33].

The final group of scales were related to collective identity and action, and included: ‘Collective efficacy’ and ‘Community support in the time of crisis’. In collective action, social cohesion and social capital are central to the change process. This starts with groups of people initially identifying commonalities with each other moves towards a belief that the group can work together to bring about changes [11, 30, 31]. Such solidarities provided people with a sense of agency and collective identity necessary to confront unequal power [12, 14, 29].

The measures also speak to another gap in understanding the poor quality of care still reported in contraceptive services [1, 15, 37]. Harris et al. [15] argue that current tools do not adequately determine the prevalence or impact of negative client experiences in contraceptive programs and that current measures can demphasise and misdirect attention from client experiences of coercion, corruption, and disrespect and abuse when they come for family planning. The scale, ‘Mistreatment by health workers’, responds to this gap and

by better capturing all dimensions of patients’ experience, we can learn what is working, or not, in terms of quality of care [2].

The study benefited from the rigorous methodology for the validation of psychometric scales [6, 27]. A limitation at this stage is that the test-retest was not conducted to examine if the measurement tools reliably replicate the result in the same situation and population. A test-retest was added to the end line data collection.

Conclusion

In this paper, we share the findings from testing a 58-item scale to measure intermediate changes among health service users during a social accountability process to improve contraceptive services. The study suggests that the multi-dimensional scales have high construct validity and reliability in both countries. Though there were differences between contexts and in some of the items and scales, there was convergence in the analysis that suggests that this measure may be relevant to multiple settings and needs to be validated in new settings.

The refined tool resulting from the CaPSAI Project has both research and programmatic utility. It will be useful for research to understand the monitoring and evaluation of social accountability processes and could help develop and target interventions. The validated scales allow for a more robust measurement of the intermediate outcomes. This scale will facilitate measurement to improve community engagement in contraceptive programs.

Abbreviations

CaPSAI: Community and Provider Social Accountability Intervention; CFA: Confirmatory Factor Analysis; CFI: Comparative Fit Index; EFA: Exploratory Factor Analysis; KMO: Kaiser-Meyer-Olkin of Sampling Adequacy; MLE: Maximum Likelihood Estimation; NHS: National Health Service; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardized Root Mean Square Residual; WHO: World Health Organization

Acknowledgments

The authors are writing this paper on behalf of the CaPSAI Project and would like to acknowledge the CaPSAI Project teams members for their

significant contribution, specifically: Mary Awelana Addah, Gll; Kamil Fuseini, Population Council Ghana; Patrick Kinemo, Sikika; Osei-Bonsu Gyamfi, Gil, Alice Monyo, Sikika; Heather McMullen, Queen Mary's University; Sigilbert Mrema; IHI, Joshua Nkila, Sikika.

Additional conceptual input was provided by James Kiarie (WHO), Ian Askew (WHO) and Karen Hardee (Evidence Project) as well as Soe Soe Thin (WHO) for analytical input.

Authors' contributions

VB: Conceptualization, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing; PS: Conceptualization, Methodology, Resources, Project Administration, Supervision Writing - Review & Editing; JPC: Conceptualization, Methodology, Project Administration, Supervision, Writing –Review & Editing; NH: Formal Analysis, Methodology, Writing –Review & Editing; MHN: Data Curation, Methodology, Software, Writing – Review & Editing. DN: Investigation, Methodology, Resources, Writing – Review & Editing DS: Investigation, Methodology, Resources, Writing – Review & Editing. The author(s) read and approved the final manuscript.

Funding

This work was supported by the Bill and Melinda Gates Foundation [OPP1084560] and the United States Agency for International Development (USAID) to the UNDP/UNFPA/UNICEF/WHO/World Bank Special Programme of Research, Development and Research Training Human Reproduction, which is the main instrument and leading research agency within the United Nations system concerned with sexual and reproductive health and rights. reproductive health and rights. This work was supported by the United Kingdom Department for International Development, and the UNDP/UNFPA/UNICEF/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP Research).

Availability of data and materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics approval and consent to participate

CaPSAI Project master and country protocols (Project ID A65896) were approved by technical and ethics review committees at the World Health Organization (WHO). Additionally, the country protocols were reviewed and approved by the Population Council Institutional Review Board (exemption approval- # EX201714) and Ghana Health Service Ethics Review Committee (GHS-ERC:009/08/2017) in Ghana. In Tanzania, the protocol has been approved by Ifakara Health Institute Institutional Review Board (IHI/IRB/ No:18–2018 and IHI/IRB/AMM/No:03–2019) and the National Institute of Medical Research (NIMR) review board (NIMR/HQ/R.8a/Vol.IX/2668), as well as the NIMR/Mbeya Medical Research and Ethics Review Committee (GB.152/377/01/214a).

Consent for publication

Not applicable.

Competing interests

No competing interests.

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Received: 12 June 2020 Accepted: 23 September 2020

Published online: 15 October 2020

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