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Effect of women's intra-household bargaining power on postnatal and infant healthcare in rural Uganda–Results from a cross sectional survey in Kyenjojo district

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Introduction

Global estimates by the United Nations inter-agency group for child mortality show that as of 2017, under-five mortality rate had decreased by 58%, from an estimated rate of 93 deaths per 1000 live births in 1990 to 39 deaths per 1000 live births. In the same period, Uganda achieved noticeable progress with the risk of a child dying before five years of age decreasing by 71% from 187 to 49 deaths per 1000 live births (UNICEF Data, 2019; You et al., 2015), and under five mortality dropped from 177 to 64 per 1000 live births (Uganda Bureau of Statistics [UBOS] and ICF International, 2017). Despite significant improvements, utilization of maternal and child healthcare services still remains a major area of concern with substantial disparities amongst women living in developing countries, most especially those in the rural areas with unacceptably low levels of access to services (Beegle et al., 2001; World Health Organisation [WHO], 2016). Although utilization of antenatal care services (ANC) is being promoted through interventions to enhance attendance and skilled health care at birth, less attention has been given to postnatal care in preventing complications and ensuring better maternal and child health care.

According to the 2016 Uganda Demographic Health Survey (UDHS), about twice as many women in rural areas (4.6%) than urban areas (2.4%) had never accessed antenatal care. Furthermore, only one half (51%) of women in rural areas compared to two-thirds (67%) in urban areas reported having received postnatal healthcare during the first 2 days after their most recent live birth (Uganda Bureau of Statistics [UBOS] and ICF International, 2017). Yet, women's access to a health facility and being attended to by a skilled provider in the postpartum period is essential in reducing maternal and neonatal deaths (Koblinsky et al., 2008). In the 2011 and 2016 UDHS about 70% of all children under five years in Western Uganda were likely to be treated in a health facility or to receive advice from a trained health care provider compared with the national average of about 80% (UBOS and ICF International, 2012, 2017) (UBOS and ICF International, 2012, 2017). Research shows that a significant percentage of deaths amongst under-five children are due to delays in seeking medical care (Kassile et al., 2014). Globally, it has been reported that the leading causes of death in under 5 children include pneumonia, diarrhoea and malaria (WHO, 2016). It is therefore highly recommended that a child presenting with symptoms such as difficulty in breathing, persistent vomiting, diarrhoea, or fever, seek care immediately (American Academy of Pediatrics, 2007; Sullivan et al., 2011).

There's evidence that receiving ANC alone may not be sufficient to improve child mortality (Singh et al., 2012; UNICEF Data, 2019). For instance, globally more than one-third of neonatal child deaths are attributable to undernutrition (Kinney et al., 2010). However,

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accessibility of health care services depends in part on the decision making power relations and the resource allocation between household members which could influence the use of the healthcare services (Nikièma et al., 2008). An equitable distribution of power relations within the household between women and their partners particularly around gender and cultural norms is closely correlated with improved child healthcare and women's reproductive health (Doss et al., 2012; Parkhurst et al., 2006). In Uganda, most ethnic groups can be described as patriarchal (Gardsbane, 2016). Consequently in a typical rural Ugandan household, a woman's and/or children's position is subordinate to the man in various household decision-making matters (Nyakato and Rwabukwali, 2013). and could influence use of healthcare services (UNICEF, 2011). Therefore, understanding how women's decision-making power at the household level relates to healthcare access and utilisation by household members is necessary in order to design and prioritize interventions for reducing maternal and child morbidity and mortality in rural areas of Uganda.

In the recent past, the scientific literature has seen a rise in quantitative studies (e.g. see, Adhikari, 2016; Ghose et al., 2017; Schmidt, 2012) and qualitative or review studies (e.g. see, Ganle et al., 2015; Richards et al., 2013; Tolhurst et al., 2008) on the relationship between women's intra-household bargaining power and maternal and child healthcare. Most of these studies have reported that higher levels of women's intra-household bargaining power are positively associated with improved maternal and child healthcare outcomes. To the best of our knowledge, there is limited literature on the effect of women's intra-household bargaining power on postnatal and child healthcare utilisation for under-five year children and plausible interventions. This paper examines the relationship between post-delivery child healthcare utilisation and women's intra-household bargaining power in rural areas of Western Uganda. Specifically, using mothers' verbal reports, we examine the relationship between postnatal care attendance for under-five year old children and women's intra-household decision-making power.

Data and methods

Design and sample size

Between July and August 2017, we administered a cross-sectional household survey questionnaire to a randomly selected sample of 323 women of reproductive age, to one per household, who had given birth in the 59 months prior to the survey. The study was conducted in Tooro sub-region of Western Uganda as defined by the 2016 UDHS which includes the districts of Bundibugyo, Kabarole, Kasese, Ntoroko, Kyenjojo, Kamwenge, Kyegegwa (UBOS and ICF International, 2017). Tooro was selected because the 2016 UDHS showed that children aged 12–23 months in this region had the lowest percentage of age appropriate immunisations at 23% compared to the national average of 37%. However, at the time of the survey, this region was experiencing internal violent tribal conflict in the districts of Bundibugyo, Kasese and Ntoroko while Kyegegwa and Kamwenge were experiencing a population upsurge due to internal displacement. We excluded the latter districts and Kabarole district because it is largely urban. Therefore, we conducted the survey only in Kyenjojo district.

We computed the sample size in terms of the number of households. The estimation formula for the required sample size was adapted from that used for household surveys (United Nations, 2008), which is an extension of the sample size estimation formula for proportions in cross-sectional surveys (Cochran, 1977). The required sample size, was computed based on a proportion of 41% of children in Tooro sub-region who were undernourished according to the 2016 UDHS (as a proxy indictor for lack postnatal and child healthcare); a sample design effect of 1.0 since only one respondent (the mother) was interviewed in each household; non-response of 5% and a margin of error set at 5%. This gives a minimum of 323 women, one per household, who had given birth in the 59 months prior to the survey date.

This survey utilised a two-stage stratified random sample design. The first stage involved selecting sub-counties from the sub-county sampling frame of Kyenjojo district. For this study, we randomly selected only three of the fifteen sub-counties because of logistical reasons. We achieved stratification by dividing each of the selected sub-counties into Enumeration Areas (EA) defined by administrative local council boundaries (equivalent to about 100 households). The second stage involved randomly selecting EAs per sub-county from a listing of all administrative villages provided by the District Population Officer. To reduce the clustering effect and have a relatively balanced design of about 105 households per sub-county, we reduced the number of households to 20–25 households per EA, giving about five EAs per sub-county, that is, 15 EAs for the entire study. Within each EA, we selected every other household to administer the survey questionnaire. A local area chairperson of each EA provided guides (resident persons) to the study team to identify selected households but did not participate in the selection of households. A local guide introduced the team of research assistants to households that fulfilled the inclusion criteria (a woman aged 18–45 years, with at least a child aged 0–59 months prior to the survey).

Outcome variables

Postnatal and child healthcare attendance: The primary outcome variable of interest in this study that is related to post-delivery healthcare utilisation was postnatal care attendance measured by a binary variable – yes/no – on whether the respondent had attended any postnatal care after delivery of their youngest living child within 6 months of delivery. The use of the phrase postnatal healthcare in this paper is expanded to include postnatal care and healthcare services for infants and children below five years of age. In Uganda, current Ministry of Health guidelines recommend that, all women who deliver from a health facility should have postnatal care checks within the first 24 h after delivery, and those who give birth from outside a health facility should be referred for postnatal care checks in health facilities within 12 h post-delivery. In many African settings, evidence also shows that at least half of the women will remain at home in the first 2 days after birth when the risk of the baby dying is highest, even though they had their birth at a health facility. Empirical data from the 2016 Uganda DHS showed that amongst women who gave birth within 2 years preceding the survey, only 54% of mothers and 56% of newborns had received postnatal check within 2 days after their most recent birth. For mothers giving birth in a health facility, there is the opportunity to delay a discharge to check the mother and baby after 24 h. However, majority of women return to the clinic at visits which coincide with the child immunization. Even at 6 weeks very few mothers are able to access skilled care which puts them at risk of illness and death. In this study, we adopted a 6 months period for postnatal and child healthcare review because low coverage of care in the critical postnatal period could have negative consequences for newborn health and other maternal and child health practices along the continuum of care. For example, expected practices such as early and exclusive breastfeeding, keeping the baby warm, infection control practices, response to illness and danger signs and maternal illness could have continuing effects on child health.

We also explored other related-health seeking behaviour through (1) length of time elapsed before seeking advice/treatment for the child – less or equal/greater than 24 h – following onset

of fever or cough that presents with breathing difficulty, and (2) whether advice/treatment was sought from a health facility for a child presenting with such fever and/or cough.

Exposure variables

Intra-household bargaining power: We measured women's intra-household bargaining power by a woman's participation in the decision-making processes and allocation of resources with respect to three main questions about who in a household usually makes final decisions with respect to (1) child health care, (2) woman's personal healthcare and (3) raising money for healthcare of household members in case of emergency. For each question, respondents selected only one response out of five types of decision-makers namely: (a) husband only, (b) wife only, (c) husband and wife jointly, (d) someone else, and (f) wife and someone else. We considered a woman to have some level of intra-household bargaining power if the response to the three questions above was either wife only or husband and wife jointly. Other questions on intra-household bargaining power with similar responses (a–f) included making decisions on purchases of daily household needs, purchases of large household properties, allocation of money earned by partner, and the respondent's visits to her personal family relatives.

Other independent variables: Included in this study were several demographic and socioeconomic variables, such as the respondent's age, marital status, religion, source of income, highest education level attained, frequency of antenatal care (ANC) attendance, receipt of tetanus toxoid vaccination and mode of delivery. Family or household composition variables included age and gender of youngest child, weight at birth and a child's current immunization status (defaulter or not), number of children living in the household, household size and presence of an elderly woman (i.e. respondent's mother-in-law or other relative older than the respondent and husband or any elderly woman over 50 years) in the household.

Data analysis

We used STATA version 15.0 (StataCorp LLC, 2017) for all data management and statistical analyses procedures. We computed basic descriptive statistics in form of frequencies, means and percentages to understand differences between distributions of variables. We present summary statistics for the outcome variable, exposure variables and other measures of women's bargaining power. We assessed independent associations between the three exposure variables for women's intra-household bargaining autonomy and postnatal care. Although it is often appropriate to use a logistic regression with binary data, in our situation we adopted a modified Poisson regression approach, as several recent studies point out that when the outcome is common it is often more desirable to estimate a relative risk (Greenland, 2004; Zou, 2004). We fitted a Generalised Linear Model with a Poisson distribution, log-link and robust error variances to estimate relative risks of the exposure variables on postnatal and child healthcare attendance. In this case, relative risks refer to the likelihood of the mother attending postnatal care, controlling for the study variables. We present crude relative risks for the exposure variables, as well as adjusted estimates for postnatal and child healthcare attendance after controlling for socio-demographic and other independent variables. We considered individual level socio-demographic characteristics and other variables identified from prior studies looking at factors associated with utility of maternal and child healthcare services such as household size and structure, use of ANC, presence of an elderly woman in the household, receipt of tetanus toxoid injection and childbirth delivery method. We explored multicollinearity between exposure and control variables, and those with p-value < 0.10 at bivariate analysis were included in the multivariable model assessing the likelihood of the exposure variable on postnatal and child healthcare attendance. We present the results for intra-household bargaining power and its association with the likelihood of postnatal and child healthcare attendance as relative risks (RR) and adjusted relative risks (aRR) with corresponding 95% confidence intervals (CIs) respectively for bivariate and multivariable analyses.

Ethical statement

We obtained ethical clearance from a local Research Ethics Committee in Uganda. Informed consent was obtained from participants prior to data collection. Confidentiality and privacy was ensured by interviewing respondents in a location away from hearing reach of other family members. Appropriate verbal referral was made for women with children who needed to seek child health services at the nearest health unit.

Results

Demographic characteristics

Table 1 shows descriptive statistics of the distribution of socio-demographic characteristics of enumerated women and their children. In total, we slightly oversampled and interviewed 334 of the required 323 women, in order to cater for any unforeseen data loses. However, we excluded 16 women who we interviewed in

Table 1
Socio-economic and demographic characteristics of the survey participants.

Variable	Freq. ($n = 318$)	Percent
Mothers' characteristics		
Age group		
Less than 25 years	136	43.0
25–29 years	88	27.9
30 years or above	92	29.1
Marital Status		
Cohabiting	177	55.7
Married	141	44.3
Education level		
No education	23	7.2
Some primary	208	65.4
Secondary or above	87	27.3
High school or tertiary	17	5.3
Religion		
Catholic	103	32.4
Protestant	86	27.0
Pentecostal	85	26.7
Other	44	13.8
Number of children		
One	78	24.5
2–5	187	58.8
6 or above	53	16.7
Received tetanus toxoid vaccination	285	89.6%
Presence of an elderly woman in household	28	8.9%
Household size		
5 or less	108	34.0
More than 5	210	66.0
ANC attendance		
Less than 4 times	78	24.7
4 or more times	238	75.3
Children's characteristics		
Gender		
Male	167	52.7
Female	150	47.3
Age group		
12 months or less	107	33.9
13–36 months	137	43.4
Above 36 months	72	22.8

Table 2
Women's bargaining power with respect to making household level decisions.

Making final decisions (alone or with partner) for:	Freq. (n = 318)	Percent
Child's healthcare	155	48.7
Personal healthcare	176	55.4
Household purchases for daily needs	139	43.7
Large purchases for household needs	124	39.0
Allocation of partners resources	115	36.2
Raising money for healthcare	220	69.2
Visits to family, relatives	211	66.4

error because they did not have a partner. The final sample analysed for this paper is 318 women, which is 98.45% response rate, of the required sample. The median (IQR) age of women was 25 (22–30) years, 75% were aged less than 30 years, 44% were married and 56% cohabiting, 7.2% had no formal education, 65.4% had some primary education, 22.0% had secondary and 5.3% more than secondary or tertiary education. Further, 24.5% had one child, 58.8% had 2–5 children and 16.7% had more than five children living in the household, and 66% had more than five people living in the household. Of all the children, 33.9% were ≤12 months, 43.4% were 13–36 months and 22.8% were 37–59 months old, while 47.3% were female.

As shown in Table 1, 75.3% of the women attended at least four ANC visits. The median (IQR) number of visits was four (3–4) and 42% had their first ANC visit between 1 and 3 months of their most recent pregnancy. Whereas mothers are required to attend at least four ANC visits, they should also receive tetanus toxoid vaccination, amongst other services provided. We found that 89.6% reported that they had received the tetanus toxoid vaccine. Of the women enroled in the study 91.2% had their babies delivered at a health facility, and of these, 6% had delivered their babies by Caesarean (C-section) at a health facility. Almost two thirds of the households had at least five people living in the household. We found that 8.9% of the households had at least one elderly woman (respondent's in-law older than the wife and husband or an elder over 50 years) living in the household. We did not obtain information on household headship or polygamous households.

Intra-household bargaining power

Table 2 gives the proportion of women who had a say or autonomy in the decision-making processes at the household level. Using the constructs in the methods section, we observed low percentages of women who contributed either alone or with their husband to the final decision on when and where to seek for child healthcare (48.7%), personal healthcare (55.4%), purchase of household items for daily use (43.7%), large household purchases (39%), and allocation of a partner's earnings (36.2%). On the other hand, we observed moderate percentages of women who contributed to decisions on raising money for health care of household members (69.2%) and ability to make personal decisions on visitation to her personal family members/relatives (66.4%).

Postnatal and child healthcare attendance

We found that 37.4% of the women had received postnatal and child healthcare within 6 months after the delivery of their youngest child (Table 3). Regarding child health care, 63.4% of mothers reported having consulted a health care facility within 24 h when their child indicated with fever in the 4 weeks prior to the survey. Overall, 80.5% reported that their youngest child had been ill with a cough that involved faster breath than usual, or short rapid breath or difficulty breathing during the 4 weeks prior to the survey. Of those that reported cough, 55.5% had sought care at a health facility and 29.3% at a drug shop, 6.3% at a village health team and the remaining 8% at other or self-management.

Association between intra-household bargaining power and postnatal care attendance

We present results of the modified Poisson regression model assessing the likelihood of postnatal and child healthcare attendance in Table 4 on the three dimensions of intra-household bargaining as exposures, namely; making final decisions on when and where to seek child healthcare, personal healthcare, and raising money for healthcare in case of urgent need (e.g., through sale of household items). In the bivariate analysis, women who contributed to the final decision making process on child healthcare were 1.38 times more likely to attend postnatal care relative risk (RR = 1.38, 95% CI [1.03–1.83]). Women contributing to the final decision on raising money for health care of family members (RR = 1.26, CI [0.77, 1.58]) and on personal health care (RR = 1.16, CI [0.87, 1.54]) were both not significantly associated with postnatal and child healthcare attendance. When we included the three exposures concurrently in the model, we observed that contributing to the final decision on mother's personal healthcare was masked and highly correlated with decision-making on a child's healthcare. Therefore, contributing to the final decision on mother's personal healthcare was not included in the multivariable analysis.

Controlling for mother and child socio-demographic characteristics, results of the multivariable model (Table 4) showed that women's contribution to the final decision on child healthcare was associated with a higher likelihood of postnatal and child healthcare attendance (aRR = 1.43, CI [1.08, 1.89]). As expected, women's contribution to the final decision on how to raising money for healthcare was not significant in the multivariable model (aRR = 1.25, CI [0.90, 1.73]). We observed a significantly higher likelihood of postnatal and child healthcare attendance for mothers with higher levels of education compared to those with

Table 3
Postnatal and child healthcare utilization by mothers with children below 59 months old at survey.

Variable	Freq. (n = 318)	Percent
Has received postnatal care for the youngest child	119	37.4
Reported child with a fever in the last 4 weeks	201	63.4
Reported child cough or difficulty breathing in the last 4 weeks	256	80.5
Wait time to seek healthcare for a child with fever or cough		
Less than 24 h	138	43.4
24 h or more	118	37.1
Not Applicable	62	19.5
Source of healthcare for a child with fever or cough		
Health facility or trained provider	217	68.2
Other places	39	12.3
Not Applicable	62	19.5

Table 4
Bivariate and multivariate estimates for intra-household bargaining power and postnatal and child healthcare attendance, controlling for mother and child demographic characteristics.

Variables		Crude relative risk (RR)	Adjusted relative risk (aRR)*
Intra-household bargaining power			
Makes decisions on child's healthcare		1.38 (1.03, 1,83)	1.43 (1.08, 1.89)
Makes decisions on raising money for healthcare		1.26 (0.77, 1.58)	1.25 (0.90, 1.73)
Makes decisions on personal healthcare		1.16 (0.87, 1.54)	
Mothers characteristics			
Age group			
Less than 25 years		1	1
25–29 years		0.71 (0.49, 1.01)	0.65 (0.45, 0.94)
30 years or above		0.70 (0.49, 1.00)	0.73 (0.45, 1.19)
Marital Status			
Married		1	
Cohabiting		0.81 (0.61, 1.07)	
Education level			
No education		1	1
Some primary		2.78 (0.95, 8.13)	3.08 (1.16, 8.18)
Secondary or above		3.74 (1.27, 11.01)	3.99 (1.49, 10.68)
Number of children			
One		1	1
2–5		0.76 (0.56, 1.03)	1.11 (0.79, 1.55)
6 or more		0.79 (0.51, 1.22)	1.59 (0.86, 2.96)
Household size			
Less than 5		1	
More or equal to 5		0.73 (0.55, 0.93)	0.81 (0.60, 1.10)
Number of times for antenatal care attendance			
Below 4 times		1	1
4 or more times		1.37 (0.94, 2.00)	1.32 (0.92, 1.89)
Children's characteristics			
Gender			
Male		1	
Female		1.02 (0.77, 1.35)	
Age group			
12 months or less		1	
13–36 months		1.01 (0.73, 1.39)	
Above 36 months		0.86 (0.57, 1.29)	
Presence of any elderly woman in the house	1.47 (1.01, 2.15)	1.56 (1.10, 2.23)	
Received tetanus injection during pregnancy	2.85 (1.14, 7.15)	2.87 (1.18, 6.97)	
Delivered baby by C-section	2.22 (1.68, 2.94)	1.86 (1.36, 2.52)	

* Final multivariable model includes two exposures and all predictors at $p < 0.1$ in bivariate model. Making decisions on mother's personal healthcare was correlated to autonomy in making decisions on child healthcare and was therefore not included in multivariable model.

no education (some primary: aRR = 3.08, CI [1.16, 8.18]; secondary or above: aRR = 3.99, CI [1.49, 10.68]). Other factors independently positively associated with a higher likelihood of postnatal and child healthcare attendance were child delivery by caesarean compared with normal delivery (aRR = 1.86, CI [1.36, 2.52]), presence of an elderly woman in the household (aRR = 1.56, CI [1.10, 2.23]) and having received tetanus toxoid vaccination during pregnancy (aRR = 2.87, CI [1.18, 6.97]). On the other hand, we observed a lower likelihood of postnatal and child healthcare attendance amongst elder mothers aged 25–29 years compared with those aged less than 25 years (aRR = 0.65, CI [0.45, 0.94]) and amongst mothers with five or more members in their households compared with those with less than five (aRR = 0.81, CI [0.60, 1.10]).

Discussion and conclusions

In this paper, we examined the relationship between intra-household bargaining power and utilization of postnatal and child healthcare services within 6 months after delivery, based on cross-sectional survey data from Kyenjojo district, in Tooro sub-region of Western Uganda. We have assumed that a woman's involvement in the decision-making processes at the household level is an indicator of her empowerment. We recognise that women's empowerment is a complex phenomenon, and several proxy measures have often been used including decision-making at the household level and control of household resources (Becker et al., 2006; Richards et al., 2013). On the other hand, women's ownership of land assets, income and employment have also been used as proxies for intra-household bargaining power (Jemimah et al., 2014; Silverman et al., 2009). In general, it id agreed in the literature that decision-making power and access to and control over resources are key elements of women's bargaining power within a household (Agarwal, 1997; Schmidt, 2012; UNICEF, 2011). In this paper, we hypothesized that intra-household bargaining power (i.e., ability to make decisions related to healthcare access and control of resources at the household level) plays an important role in improving healthcare seeking behaviours, and this can in turn augment its effects on maternal and child health outcomes.

We found that postnatal and child healthcare attendance was very low at just over one third of all surveyed mothers (37.4%). The low maternal postnatal and child healthcare attendance was not very different from the poor child health seeking behaviour, that is, of the 80.5% mothers that reported a cough with difficulty, breathing only in the four weeks prior to the survey; only 55% had sought care at a healthcare facility within 24 h. These findings portray a negative picture of child healthcare in this setting. Our descriptive results show that a moderate number of women contribute to the decision-making processes with respect to when and where to seek for personal healthcare, child healthcare and in raising funds for healthcare of household members. However, we observed lower proportions of women involvement in the decision-making processes for purchases of large household items, daily

household items and allocation of their partner's resources or incomes.

We found that women who contributed to the decision-making processes on child healthcare, personal healthcare, and how to raise money for healthcare of family members were about 20% more likely to attend postnatal and child healthcare within 6 months of delivery, compared to women who were unable to make such decisions. However, making decisions on personal and child healthcare were highly correlated within the multivariable model. Other proxies for intra-household bargaining power such as making decisions on visitations to a woman's relatives, on household big or daily purchases and allocation of a partner's incomes were not statistically significantly associated with postnatal and child healthcare attendance. We found maternal education to be positively associated with postnatal and child healthcare attendance; women with some primary, secondary or higher education were about three times more likely to attend postnatal and child healthcare, compared with women without formal education. This finding is similar to previous studies that have shown education to be associated with improved child health outcomes as well as women's empowerment (Richards et al., 2013). Richards et al., further note that women's access to and control of resources as well as the ability to contribute to decisions on child healthcare is positively associated with household dynamics such as composition and relationships between different members. Moreover, several qualitative studies have found positive associations between intra-household women's bargaining power and child health, treatment seeking behaviour and infant feeding (Becker et al., 2006; Beegle et al., 2001; Richards et al., 2013).

Furthermore, we found that women who lived in households with an elderly woman are 1.5 times more likely to attend postnatal and child healthcare compared with those in households without such an elder. The social-cultural context of households in this setting is that there exists a hierarchy where, for instance, mothers-in-law or other elderly persons have a higher level of authority in the household (Aubel, 2012). In the context of the current study, elderly persons seemed to have a positive influence on postnatal and child healthcare attendance. Other factors independently and positively associated with postnatal and child healthcare attendance are having been immunised for tetanus during pregnancy, and giving birth through a caesarean operation. We believe the association with tetanus vaccination is intuitive and perhaps may allude to the health-seeking behaviour of individuals, or that ANC attendance within 16–28 weeks of pregnancy, when tetanus toxoid immunization normally takes place is indicative of postnatal and child healthcare attendance. On the other hand, mothers delivered through caesarean coincides with the need for continued health monitoring after delivery.

Considering our objectives, we would like to highlight some definitional aspects in order to give credence to conclusions from this study. Firstly, we take note that several studies have used proxy measures for women's intra-household bargaining power, which may be different from those used in the present our study. For instance, Schmidt (2012) used three themes to measure women's bargaining power on who usually makes decisions about (1) child health care, (2) making purchases for daily household needs, and (3) making major household purchases. These were concurrently included in a statistical model to assess effects on children's height-for-age z-scores. On the other hand, Ghose et al. (2017) used four questions to measure women's decision-making power on the person who usually decides on (1) respondent's healthcare, (2) large household purchases, (3) child's healthcare, and (4) respondents visits to family or relatives. The authors followed a similar statistical modelling approach as that of Schmidt to predict three maternal healthcare outcomes namely (1) antenatal care attendance, (2) delivery from a health facility delivery services, and (3) postnatal care. On the other hand, for Adhikari (2016), women' s decision-making autonomy was measured based on a combination of responses to respondent' s responses to three questions about (1) obtaining personal health care, (2) large household purchases, and (3) visits to family or relatives. Then, a woman's decision-making autonomy was computed as a binary variable where a '0' was assigned to a woman 'not involved in all three household decisions' and a '1' to a woman who had 'any say in all three household decisions' for three outcome variables similar to those of Ghose et al. (2017). Consequently, generalising our findings to other contexts requires an understanding of the different constructs taking into account differences in definitions of women's intra-household empowerment. Nevertheless, profiling the women's intra-household bargaining power relations is informative in settings of similar social context, gender and cultural norms. Secondly, although we considered only two main variables as proxy exposures for intra-household bargaining power (i.e., involvement in the decision making process for child healthcare and raising money for healthcare), we controlled for several mother and child characteristics, as well as household-level composition, in the final statistical model. This, we believe strengthens our findings. However, we did not explore the issue of polygamous households. Several studies highlighted this as an influence on intra-household power dynamics and resource allocation (Hampshire et al., 2009; Richards et al., 2013). These arguments show the complexity of intrinsically defining intra-household bargaining power across different social contexts, all of which provide a window for more focused research and standardization.

One main strength in our study is the assessment of the association between intra-household bargaining power and postnatal and child healthcare attendance from a quantitative perspective. This opens a window for research into mechanisms through which different constructs of intra-household relations result in improved post-delivery maternal and child healthcare outcomes. Such research may benefit from leveraging the successes observed in implementing interventions such as antenatal care to building collaborations with programmes related to women empowerment. Therefore, contributing to efforts that empower women to have greater control over child and personal healthcare through gender transformative approaches and policy engagements in important.

Ethical approval

We obtained ethical clearance from the Research Ethics Committee of Mbarara University of Science and Technology, Uganda (Study Protocol #11/09-17)

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Declaration of Competing Interest

All the authors declare no conflict of interest.

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