Do adolescents experience worse care quality than other women? A secondary analysis of over 9000 antenatal visits in four countries

Abstract

Background: Adolescents face a high risk of many poor health outcomes – including maternal conditions, which are the leading cause of death among young women worldwide. High-quality antenatal care may be one approach to improving maternal and neonatal outcomes in this population. This study uses a standardized, multi-country dataset to compare components of antenatal care for women below and above age 20.

Methods: In total, 9095 antenatal care visits were analyzed, from 4159 health facilities in Haiti, Malawi, Nepal, and Tanzania. Service Provision Assessment surveys in these countries include direct observation of antenatal care visits, and exit interviews with clients. The main analyses compare content of these visits, based on World Health Organization (WHO) recommendations, for adolescents to women over age 20. Covariates in the model included parity and educational attainment; all models are multilevel (facility, provider, client) and weighted to reflect survey sampling design.

Findings: In the pooled multi-country analysis, adolescents are less likely to experience all but one antenatal care activity compared to those of women over age 20, including significantly lower odds of being asked about pregnancy danger signs (adjusted odds ratio 0.50 [95% confidence interval 0.27, 0.94]) and being counseled on delivery preparation (adjusted odds ratio 0.46 [95% confidence interval 0.22, 0.95]). Adolescents are however significantly and substantially more likely to report being very satisfied with their care that day, and to report fewer complaints, than women over age 20 (adjusted odds ratio 2.33 [95% confidence interval 1.26, 4.30] and coefficient -0.36 [95% confidence interval -0.13, -0.56]). Overall the country-stratified results (with the exception of Haiti) are very similar to the pooled findings for these objective and subjective quality measures.

Interpretation: Adolescents' antenatal visits include fewer WHO-recommended care components than older women's visits, with particular gaps for communication-based activities, yet they do not perceive this lower-quality care. This suggests opportunities for strengthening care quality by working with providers to develop skills for communicating effectively with young women.

Background

Since the year 2000, there have been major global gains in improving maternal and child health,[1,2] yet many of these gains have not been observed among adolescents. In addition, a substantial effort is still needed to reach the ambitious Sustainable Development Goal targets.[3] Young women are a particularly vulnerable group: maternal conditions are the leading cause of death among young women aged 15-19 years worldwide,[4] and most of these deaths are preventable.[5] Children of adolescent mothers also experience worse neonatal and perinatal outcomes.[6] (The evidence on maternal mortality by age is less clear-cut.[7]) Youth aged 10-19 years comprise over 20% of the total population in low-income countries (16% of the total global population),[8] so they represent an sizeable and important group although adolescent health is chronically under-resourced by global donors.[9]

The provision of high-quality health services is essential for improving health outcomes across the reproductive, maternal, newborn and child health (RMNCH) continuum.[10] Evidence has indicated that high-quality antenatal care can improve neonatal and maternal outcomes, particularly via detection of high-risk pregnancies, administration of clinical interventions (e.g., tetanus toxoid immunization and

malaria prophylaxis), and counseling on birth preparedness and newborn care.[11-13] However only approximately half of women globally receive the four-visit series recommended by the World Health Organization (WHO);[1] fewer than one-quarter of women in low-income countries begin receiving antenatal care during their first trimester as is recommended;[14] and the content of antenatal care varies widely and many women do not receive the WHO-recommended antenatal care components.[15-17] There are many barriers to antenatal care utilization, including affordability and ability to pay, access and travel challenges, and disrespect and abuse from health care providers.[18-20]

Adolescents are a unique population with special needs owing to developmental stage, biological vulnerabilities, and social and environmental influences.[21,22] They may also be less likely to seek health care,[23] and may receive lower-quality care[24] – both of which may be critically important for improved outcomes including in RMNCH.[25-27] A recent meta-analysis of Demographic and Health Surveys found that adolescents in West Africa reported fewer antenatal visits, later antenatal attendance during their pregnancy, and fewer antenatal care components, compared to older first-time mothers.[23] By addressing women's health through a life-course approach that includes adolescence, the global health community can better understand the unique challenges and opportunities faced, and develop policies and programs to address these.[28]

Youth-friendly health services are characterized as being accessible, equitable, acceptable, appropriate, comprehensive, effective and efficient;[29] for example, staff are supportive and respectful of adolescents, information is communicated clearly, and care is comprehensive, evidence-based, and uses active listening.[30] A recent systematic review found some evidence that providing comprehensive youth-friendly services at health facilities (both by training clinicians and making youth-oriented facility improvements) can improve RMNCH outcomes among adolescents.[31] The WHO has developed a package of "global standards" for improving the quality of all health services for adolescents: health literacy, community support, appropriate services, provider competencies, facility characteristics, equity and nondiscrimination, data and quality improvement, and participation of adolescents.[27] However much remains to be done in understanding the implementation and uptake of youth-friendly services for adolescents.

This analysis uses data from recent Service Provision Assessment surveys to examine the current state of antenatal care quality for adolescents in four low-income countries. These data are unique because they are nationally-representative surveys that capture both directly-observed clinical data as well as patient-reported perceptions of care, enabling analyses of objective (both technical and interpersonal) and perceived quality with large sample sizes. The main research question is: do adolescents receive worse (or better) antenatal care quality than older women (over age 20)? To our knowledge this is the most comprehensive analysis to date about age inequalities in care in low-income countries; and is the first study to utilize standardized, nationally-representative, multi-country clinical observation data to examine questions of antenatal care quality and comprehensiveness for adolescents.

Methods

Data source: The Service Provision Assessment (SPA) surveys are administered by the Demographic and Health Survey (DHS) program. The surveys collected data from public and private health facilities in study countries, and include information on facility and provider characteristics, as well as direct service observation and client exit interviews for women seeking antenatal care. This analysis used SPA data from the four most recent surveys with comparable service observation modules: Haiti (data collected in

2013),[32] Malawi (data collected in 2013-14),[33] Nepal (data collected in 2015),[34] and Tanzania (data collected in 2014-15).[35] (More information on the datasets, sampling and surveys can be found in the Appendix.)

Box 1 presents contextual information on the four sampled countries. All are low-income countries, and they represent three different geographic regions. Women bear on average fewest children in Nepal (total fertility rate of 2.3) and the most children in Tanzania (5.2). Nearly 30% of adolescents in Malawi and Tanzania have begun childbearing according to household surveys, while adolescent fertility is lower in Haiti and Nepal (both measured by the age-specific fertility rate and by adolescent childbearing data). Use of antenatal care is very common in all four countries but the recommended four-or-more sequence is less common (only half of women in Malawi and Tanzania, and approximately two-thirds in Haiti and Nepal).

Box 1: Contextual information on the four sampled countries

	Haiti	Malawi	Nepal	Tanzania
Income classification [36]	Low-income	Low-income	Low-income	Low-income
Geographic region [36]	Latin America and the Caribbean	Sub-Saharan Africa	South Asia	Sub-Saharan Africa
Total fertility rate (TFR; average births per woman) [37]	3.5	4.4	2.3	5.2
Adolescent age-specific fertility rate (ASFR; live births per 1000 women aged 15-19 years)[37]	66	136	88	132
Median age at first birth (reported by 25-49 year olds)[37]	22.3	19.0	20.4	19.7
Adolescents who have begun childbearing (%)[37]	14.2%	29.0%	16.7%	26.7%
Any antenatal care from a skilled provider (during previous 5 years) (%)[37]	90.0%	94.8%	83.6%	98.0%
4+ antenatal visits (during previous 5 years) (%)[37]	67.3%	50.6%	69.4%	50.7%

Variables: For this analysis we focus on whether evidence-based antenatal care components are delivered during the visit (per direct service observation data). Starting with the WHO recommended package of focused antenatal care activities,[38] we include activities that should be administered to all women during at least 2 antenatal care visits (since the SPA service observation may enroll women at any point during their antenatal sequence), and excluded those activities that were recommended for referral centers only. Box 2 shows the WHO-recommended activities and how these are represented in the SPA datasets.

Box 2: WHO-recommended antenatal care components and correspondence with SPA indicators

WHO Focused Antenatal Care model[38]		Activity in SPA dataset
Category	***Activity***	
History	Assess symptoms	Ask about at least 1 pregnancy danger sign
Examination	Assess anemia	*(See "screening and tests" below)*
	Take blood pressure	Take blood pressure

	Assess fetal growth	Inform about progress of pregnancy
Screening and tests	First visit: hemoglobin, syphilis, HIV, proteinuria	Perform at least 1 routine test (urine, syphilis, blood grouping, anemia)
Preventive measures	Tetanus toxoid	Provide any injection or counseling for tetanus toxoid
	Iron and folate	Give at least 1 aspect of iron treatment or counseling
	IPTp (malaria)	Perform at least 1 aspect of HIV or malaria counseling, testing or treatment
	ART (HIV)	
Health education, advice, counseling	Birth and emergency plan	Counsel on at least 1 aspect of delivery preparation
	Infant feeding and postpartum care	Give at least 1 postpartum/newborn care recommendation
	Pregnancy spacing	Ask about postpartum family planning

** Category of "treatments" excluded because not relevant for all women (i.e., conditional on having an infection which limits sample size, and may be endogenous to age).*
IPTp: intermittent preventive treatment in pregnancy
ART: antiretroviral therapy

We also look at provider communication, as an important aspect of care quality:[39] did the provider ask if the client had questions, and did the provider use any visual aids during the interaction. We create two indices to summarize all the items in Box 2 plus these communication quality measures. First, we create a simple sum (count) of all the items ("activity count"). Second, we create an unweighted index[40,41] by demeaning each variable and dividing by its standard deviation among women over age 20, and then averaging these for each woman's unweighted quality index score ("quality index").

Lastly, we include perceived quality of care measures based on questions asked during an exit interview about the client's level of satisfaction with the care they received that day. Women were asked whether they were very satisfied, more or less satisfied, or not satisfied with the services they received that day; we dichotomized this to very satisfied or not. We also construct a score that assigned 1 point per reported complaint for that day's visit (wait time, ability to discuss problems, amount of explanation received, auditory and visual privacy, availability of medicines, hours and days of service availability, cleanliness, treatment by staff, and service costs) ("complaint score").[42]

Analysis: The main analyses use multilevel multivariable models (antenatal care visits nested within providers, who are nested within facilities) to examine the outcome variables described above. Models are specified as logistic regressions for binary outcomes, and linear regressions for continuous outcomes (i.e., scores). The main independent variable is whether the woman receiving antenatal care is an adolescent, and this is classified based on self-reported age (below 20 years, or 20 years and older). All multivariable models include survey country, facility type, facility location (urban or rural), client self-reported nulliparity, client self-reported number of previous antenatal care visits at that facility during this pregnancy, and client self-reported education level (none, primary, or secondary/beyond). Robust standard errors are clustered at the facility and provider level. Due to small sample sizes for some analyses, we report levels of significance up to α=0.1. SPA surveys use a stratified sampling strategy, so all analyses include scaled sample weights (unweighted model results are available in the Appendix), per recent recommendations.[43] Analyses were conducted using Stata v14.2.

Ethical review: The DHS program makes SPA survey data available for research, and the University of California Los Angeles Institutional Review Board classified this study as non-human subjects research and exempt from review.

Results

Characteristics of the surveyed sample are shown in Table 1. In total, 4159 health facilities contributed data to this analysis and 9095 antenatal care visits were included. Between 12-21% of these antenatal visits are for women aged 19 or younger (lowest in Haiti, highest in Malawi). In Nepal approximately half of women are first-time mothers, but this is less common in the other countries (25-34%). Overall educational attainment is highest in Nepal and lowest in Malawi and Tanzania.

Table 1: Description of the sample

	Haiti	Malawi	Nepal	Tanzania
Dataset information				
Year of data collection	2013	2013-14	2015	2014-15
Facilities surveyed, n	907	1060	992	1200
Antenatal visits observed, n	1606	2002	1519	3968
Among adolescents, n (%)	*197 (12.3%)*	*428 (21.4%)*	*264 (17.4%)*	*664 (16.7%)*
Main covariates				
First pregnancy (self-reported), n (%)	539 (33.6%)	506 (25.3%)	738 (48.6%)	1107 (28.0%)
Education level, n (%)				
None	239 (14.9%)	251 (12.5%)	0	659 (16.6%)
Primary	577 (35.9%)	1271 (63.5%)	581 (38.3%)	2371 (59.8%)
Secondary or beyond	790 (49.2%)	480 (24.0%)	938 (61.8%)	938 (23.6%)

In the full sample (all ages pooled), some antenatal care activities are more frequently performed than others (Figure 1). (Two variables were dropped from the analysis because their variance was almost entirely explained by facility or provider, respectively: taking of blood pressure, and use of visual aids.) Over half of women in all countries were asked about at least one pregnancy danger sign, and over two-thirds received at least one aspect of iron treatment or counseling. At the other extreme, certain activities were uncommon including asking about postpartum family planning (this was most common in Tanzania where only 36% of women were asked about this, but in Haiti and Nepal fewer than 10% of women were asked) and providing postpartum or newborn care recommendations (again most frequent in Tanzania with 43% of women receiving this advice, and least common in Haiti and Nepal). Haiti and Nepal generally saw lower frequencies of communication-based activities -- including informing women about the progress of their pregnancy and counseling on at least one aspect of pregnancy preparation -- compared with Malawi and Tanzania; and in Haiti and Nepal, it was also less common for providers to ask or encourage questions (only 40-56% of visits, compared with above 80% of visits in Malawi and Tanzania). Satisfaction with care was very high in all countries except Nepal: over 85% of women in Haiti, Malawi and Tanzania were very satisfied with their services that day, but only 43% of women in Nepal reported being very satisfied. (Table with satisfaction data available in the Appendix.)

Figure 1: Frequency of antenatal care activities, all women (%)

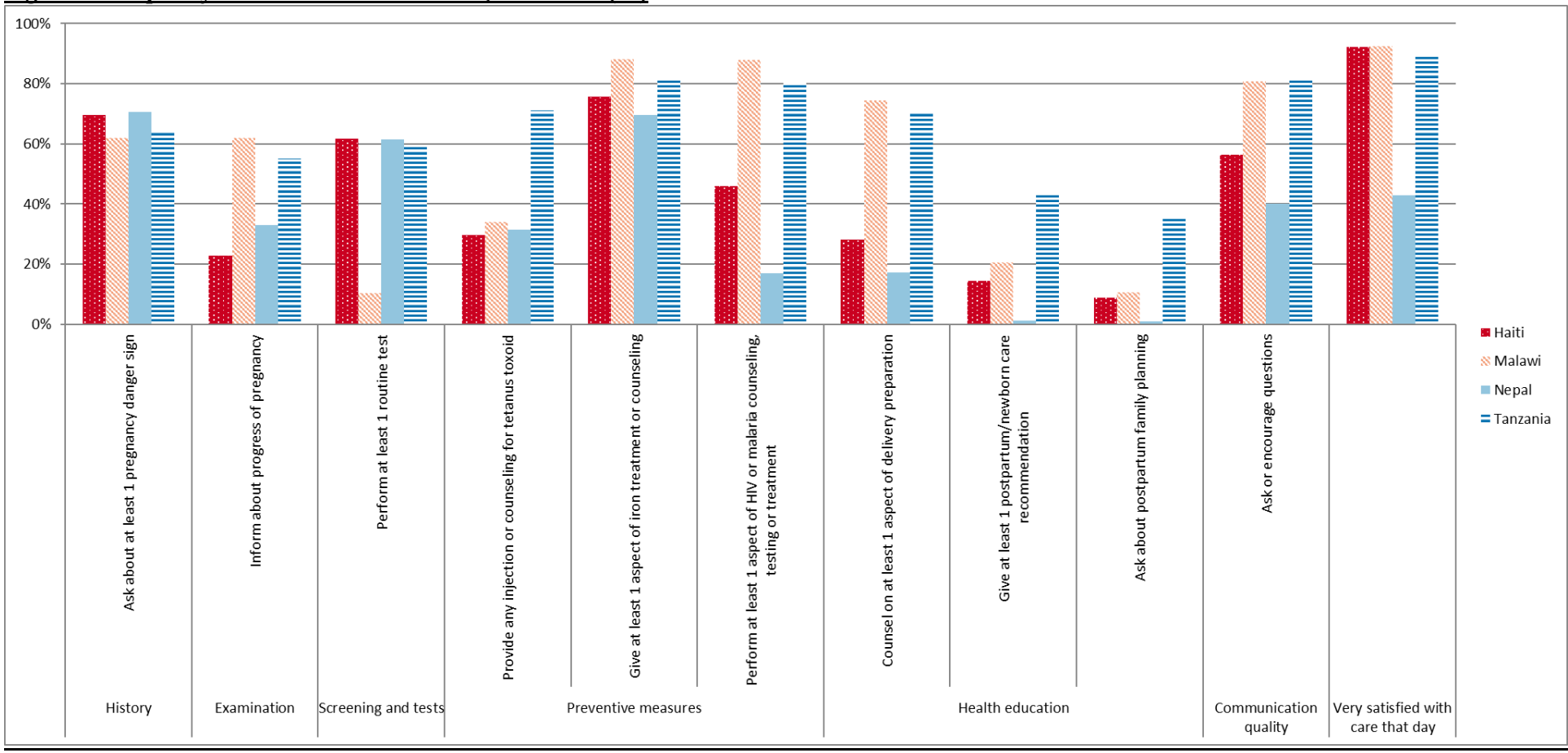

Table 2 shows that adolescents are less likely than women over age 20 to receive many antenatal care components. In multilevel multivariable models, adolescents have lower odds of every antenatal care component except tetanus toxoid, when compared to women over age 20; and these differences are large and statistically significant for asking about pregnancy danger signs and counseling on delivery preparation (AORs of 0.50 and 0.46 respectively). Looking at the category level, adolescents experience lower odds of receiving any activity in the categories of history, examination, health education and communication quality (only history was significant). Adolescents also have a significantly lower overall count of antenatal care activities (-0.28 activities fewer on average than women over age 20), and a lower composite quality index score.

Table 2: Quality of antenatal care for adolescents versus women over age 20

Each antenatal care activity/category: Odds ratio (95% confidence interval)		
Category	**Activity**	**Odds of each activity**
History	*Ask about at least 1 pregnancy danger sign*	0.50* (0.27, 0.94)
Examination	*Inform about progress of pregnancy*	0.78 (0.42, 1.44)
Screening and tests	*Perform at least 1 routine test*	0.97 (0.54, 1.75)
Preventive measures	*Provide any injection or counseling for tetanus toxoid*	1.37 (0.86, 2.19)
	Give at least 1 aspect of iron treatment or counseling	0.94 (0.45, 1.98)
	Perform at least 1 aspect of HIV or malaria counseling, testing or treatment	0.80 (0.46, 1.39)
Health education, advice, counseling	*Counsel on at least 1 aspect of delivery preparation*	0.46* (0.22, 0.95)
	Give at least 1 postpartum/newborn care recommendation	0.72 (0.32, 1.60)
	Ask about postpartum family planning	0.87 (0.36, 2.13)
Communication quality	*Ask or encourage questions*	0.55† (0.26, 1.15)
Overall care quality measures: Coefficient (95% confidence interval)		
Activity count		-0.28*
Quality index		-0.05†

Multilevel (facility, provider, client) models with sample weights, robust standard errors clustered at the provider level; covariates: survey country; self-reported first pregnancy and education level (none, primary, secondary or beyond); facility type and urban/rural classification
"Routine tests" are: urine, syphilis, blood grouping, or anemia
*† p<0.1, * p<0.05, **p<0.01, ***p<0.001*

Table 3 shows adolescents' relative odds of each antenatal care activity, and overall care quality measures, by country. In Malawi, Nepal and Tanzania, adolescents are much less likely than women over age 20 to be asked about pregnancy danger signs (AORs between 0.24-0.62). Many activities in the preventive measures category are not any less common during adolescents' antenatal visits than women over age 20; but activities in the health education category saw lower odds among adolescents in several countries. In Nepal, adolescents have higher odds of communication quality activities than women over

age 20 (though not significantly so), but in all other countries, the odds are lower (though not significantly so). The activity count and overall quality index are lower for adolescents than women over age 20, in all countries except Haiti, but significantly so only in Tanzania.

Table 3: Quality of antenatal care for adolescents versus women over age 20 (country-stratified models)

Each antenatal care activity/category: Odds ratio (95% confidence interval)					
Category	**Activity**	**Malawi**	**Nepal**	**Tanzania**	**Haiti**
History	Ask about at least 1 pregnancy danger sign	0.62* (0.38, 0.99)	0.24* (0.06, 0.97)	0.39† (0.13, 1.20)	1.33 (0.74, 2.42)
Examination	Inform about progress of pregnancy	0.71 (0.39, 1.36)	0.41 (0.07, 2.31)	0.91 (0.38, 2.17)	1.04 (0.57, 1.89)
Screening and tests	Perform at least 1 routine test	0.94 (0.23, 3.86)	1.87 (0.50, 6.96)	0.94 (0.38, 2.35)	1.08 (0.65, 1.81)
Preventive measures	Provide any injection or counseling for tetanus toxoid	0.99 (0.45, 2.18)	1.61 (0.72, 3.60)	1.34 (0.61, 2.96)	1.47 (0.91, 2.39)
	Give at least 1 aspect of iron treatment or counseling	0.98 (0.35, 2.68)	0.86 (0.21, 3.63)	0.68 (0.21, 2.24)	2.01* (1.09, 3.68)
	Perform at least 1 aspect of HIV or malaria counseling, testing or treatment	1.05 (0.41, 2.71)	1.70 (0.57, 5.07)	0.69 (0.28, 1.69)	1.06 (0.60, 1.87)
Health education, advice, counseling	Counsel on at least 1 aspect of delivery preparation	1.41 (0.56, 3.52)	0.17† (0.03, 1.08)	0.32† (0.10, 1.01)	0.60† (0.35, 1.03)
	Give at least 1 postpartum/newborn care recommendation	1.77 (0.58, 5.37)	n/a	0.60 (0.22, 1.61)	1.34 (0.61, 2.93)
	Ask about postpartum family planning	0.86 (0.28, 2.65)	n/a	0.81 (0.28, 2.35)	1.34 (0.47, 3.82)
Communication quality	Ask or encourage questions	0.59 (0.17, 2.02)	1.32 (0.32, 5.48)	0.48 (0.16, 1.46)	0.61 (0.28, 1.29)
Overall care quality measures: Coefficient (95% confidence interval)					
Activity count		-0.10 (-0.31, +0.12)	-0.16 (-0.80, 0.47)	-0.36† (-0.73, 0.02)	+0.05 (-0.25, +0.34)
Quality index		-0.02 (-0.07, +0.03)	-0.03 (-0.16, 0.09)	-0.06† (-0.13, 0.01)	+0.01 (-0.05, +0.07)

Multilevel (facility, provider, client) models with sample weights, robust standard errors clustered at the provider level; covariates: survey country; self-reported first pregnancy, and education level (none, primary, secondary or beyond); facility type and urban/rural classification
"Routine tests" are: urine, syphilis, blood grouping, or anemia.
*† p<0.1, * p<0.05, **p<0.01, ***p<0.001*

Despite the overall lower quality of care received by adolescents, however, they were much more likely to report being very satisfied with their care when compared to women over age 20 (AOR 2.43), and voiced on average 0.34 fewer complaints (Table 4). In all countries, adolescents were more likely than women over age 20 to be very satisfied with that day's services and to have a lower complaint score, but these differences are statistically significant only in Tanzania (country-stratified results are shown in the Appendix). There is also no significant association between the number of quality antenatal care activities and being satisfied with care (results not shown).

Table 4: Satisfaction with antenatal care for adolescents versus women over age 20 (pooled model)	
Very satisfied with that day's services (versus somewhat or not satisfied), odds ratio (95% confidence interval)	2.43** (1.34, 4.39)
Complaint score, coefficient (95% confidence interval)	-0.34** (-0.56, -0.12)
Multilevel (facility, provider, client) models with sample weights, robust standard errors clustered at the provider level; covariates: survey country; self-reported first pregnancy, number of previous antenatal visits at that facility, and education level (none, primary, secondary or beyond); facility type and urban/rural classification *† p<0.1, * p<0.05, **p<0.01, ***p<0.001*	

Robustness: To assess the potential of alternate explanations for these findings, we conduct various robustness checks. First, we explore a possible parity effect: what if women giving birth for the first time are treated differently regardless of age? When comparing first-time mothers (self-reported nulliparous women) in both age groups (above and below 20), the results mirror those in the main analyses (results table available in Appendix), which suggests our results are not being driven by a parity effect. Second, we include a covariate to adjust for the number of previous antenatal visits at this facility. The care indicators in this analysis are selected because they should be performed throughout the antenatal care sequence, so it is not surprising that the inclusion of this covariate does not substantially affect the findings (see results in the Appendix). Third, we test whether our results are sensitive to the cutoff age of 20. For example it might be younger age, rather than adolescence per se, for the differential quality of care. We repeat the main analyses and shifted the cutoff age (e.g., comparing women above or below age 21, or age 22). The odds of many antenatal care activities decrease as the age cutoff decreases, although it is difficult to interpret levels of significance due to decreasing sample size at younger ages (results table available in Appendix). Certain activities, including asking or encouraging questions, and performing HIV or malaria testing or counseling, show a monotonically decreasing but never significant odds ratio with younger age cutoffs. Although some activities are more frequent among younger mothers, such as providing iron treatment or counseling, and asking about postpartum family planning, these odds ratios are not statistically significant. Fourth, due to the hierarchical nature of the dataset and the sampling procedures utilized at the facility and provider levels, we use a relatively new statistical method for including sampling weights. We explore alternative approaches and results from these models are included in the Appendices; no substantial differences are seen across these, suggesting the results are not sensitive to the weighting approach. Lastly it is important to note that adolescents and women over 20 are visiting the same providers—so our findings are not being driven by adolescents visiting lower quality providers.

Discussion

This multi-country analysis finds that many evidence-based care components are delivered infrequently during directly-observed antenatal care visits to adolescents. Particularly uncommon are those activities relating to postpartum counseling; and in Haiti and Nepal, counseling on delivery preparation and on progress of pregnancy were also relatively uncommon. In contrast, certain clinical behaviors, such as iron treatment, were conducted at most visits. (HIV and malaria prophylaxis and counseling were commonly provided in endemic settings [i.e., Malawi and Tanzania].)

Quality of care is a nuanced and multifaceted concept with both technical and interpersonal components.[44] These results point to particular gaps in interpersonal care quality during antenatal visits, and mirror findings from the broader literature. For example, a study in Tanzania similarly identified certain clinical activities (e.g., blood pressure measurement, assessing for anemia) as more prevalent during antenatal visits than communication-based activities like health education and history-taking;[45] and a multi-country study of antenatal visits found that women were more likely to report having had their blood pressure taken and having been given iron prophylaxis, versus provided information on complications.[46]

A unique contribution of this analysis is its focus on the antenatal care experience of adolescents compared to women over age 20. According to these results, younger women are less likely to receive high-quality antenatal care (defined by these WHO-recommended activities) – and particular gaps are seen in communication-dense activities such as asking about pregnancy danger signs, and counseling on delivery preparation.

When results are stratified by country, there is some variability both in the prevalence of the activities and in the relative experience of adolescents. Although the results presented here cannot assert a causal relationship between adolescence and antenatal care quality, nor indicate mechanisms for the results, the inter-country differences suggest some hypotheses that merit further research. For example, in Haiti many of the antenatal care activities are more common among adolescents than older women; among the surveyed countries, Haiti also has the lowest adolescent fertility (and has the smallest adolescent antenatal care sample). Future research might therefore probe whether there is an association between prevalence of adolescent motherhood and provider bias against younger mothers.

Despite adolescents receiving lower care quality based on objective measures, they are less likely to report problems with care and are much more likely to report being highly satisfied with their care than older women. This finding is interesting as it suggests adolescents are unaware they are receiving lower quality services – and is supported by a broader literature that indicates a low correlation between actual and perceived care quality. An earlier analysis of SPA facility data found that availability of childbirth services (as a proxy quality measure) was not strongly associated with patients' perception of quality,[42] although recent findings suggest that service availability is a weak measure of objective care quality.[47] Another recent study using SPA data found an association between provider communication and patients' satisfaction and intent to return for child health services.[39] Qualitative research has enumerated how provider behavior and communication might affect women's willingness to seek antenatal care,[48-50] but very few studies have rigorously examined how antenatal care quality, including both technical and interpersonal, affects patient perceptions and behaviors.[51]

The WHO has recently updated its antenatal care recommendations to emphasize person-centered care.[52] These new recommendations encourage eight antenatal visits (the first at 12 weeks' gestation) and additional care components including ultrasound assessment and nutrition counseling; the recommendations also focus on the provision of high-quality care that is respectful and individualized. Given the gaps identified here in interpersonal care components, and the broader literature about adolescents' delayed initiation of and poor attendance at antenatal care, the global health policy and clinical communities should strive to identify ways to strengthen skills required to provide person-centered care for young women, who may be particularly vulnerable. Additionally, there is an urgent need for new indicators (and data) about person-centered care.[15,53] This analysis highlights the importance of stratifying these data by age group, and being attentive to the unique position and needs of adolescents.

Some limitations to this analysis should be noted. First, only four countries were included in this analysis due to data availability; as new SPA datasets with comparable antenatal care indicators are made available, future studies should replicate and expand this analysis in order to increase its generalizability. Second, the operationalization of "care quality," which used WHO guidelines and the available SPA variables, does not encompass all possible antenatal care activities, and in particular includes only coarse measures to capture interpersonal communication. Lastly, it is impossible to rule out the potential role of omitted or unobserved variables in this relationship. This is particularly worth noting since not all important factors that might affect this relationship are included in the SPA data; for example, marital status is not included in the data, and may contribute to the associations seen here if adolescents are less likely to be married and if unmarried women are likely to receive worse care.

Conclusions

These are the most comprehensive findings to date about directly-observed care quality during antenatal visits, and about differences in quality for adolescents versus women over age 20. Although adolescent fertility is on the decline, childbearing during adolescence remains very common – and these results indicate that adolescents are receiving worse quality of antenatal care relative to older women. As the global community works to improve the health of adolescents, including birth outcomes, quality of antenatal care should be prioritized. In particular, interventions to strengthen provider-patient communication, for example via incentives or further education and training, may be especially valuable for this population. Further research is needed on the acceptability, impact and cost-effectiveness of such supply-side interventions for improving quality of care for adolescents.

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