

Mother and newborn skin-to-skin contact in sub-Saharan Africa: prevalence and predictors

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ABSTRACT

Introduction Skin-to-skin contact is an evidence-based intervention that signifies a situation whereby a newborn is positioned directly on the mother's abdomen or chest in order for them to have direct ventral-to-ventral skin contact. The act of skin-to-skin contact begins immediately after delivery to about 23 hours afterwards. Evidence shows that skin-to-skin contact is important in improving child health outcomes. Nevertheless, evidence on its prevalence and predictors in sub-Saharan Africa (SSA) remains sparse. The study, therefore, estimated the prevalence of skin-to-skin contact between mothers and their newborns, as well as its predictors.

Methods Using data from the recent Demographic and Health Survey conducted between 2015 and 2020 from 17 countries in SSA, we included 131 094 women who gave birth in the last 5 years preceding the survey in the final analysis. We used percentages to summarise the prevalence of skin-to-skin contact. Multilevel logistic regression analysis was used to determine the predictors of skin-to-skin contact. Adjusted odds ratios (ORs) with their corresponding 95% confidence intervals (CIs) were used to present the results of the regression analysis.

Results Approximately 42% (41.7 to 42.2) of mothers practiced newborn skin-to-skin contact. The highest prevalence was found in Benin (75.1% (74.1 to 76.0)) and the lowest prevalence in Nigeria (11.7% (11.2 to 12.1)). The likelihood of skin-to-skin contact was higher among women covered by health insurance, those who delivered in health facilities, those in the richest wealth index, women who attended 1–3 antenatal care (ANC) visits and four or more ANC visits, and those with secondary or higher education. The odds of skin-to-skin contact was low among women who delivered by caesarean section (adjusted OR=0.15; 95% CI 0.13 to 0.16).

Conclusion Considering that less than half of the surveyed women practiced skin-to-skin contact, it is expedient for intensification of advocacy and strict supervision of the practice within the included countries. Informal educational programmes can also be rolled out through various media platforms to sensitise the public and healthcare providers on the need for skin-to-skin contact. These will help maximise the full benefits of skin-to-skin contact and expedite prospects of achieving the Sustainable Development Goal targets 3.1 and 3.2.

Key questions

What is already known?

- ▶ There are approximately 6,700 newborn deaths every day, amounting to 47% of all child deaths under the age of 5 years, up from 40% in 1990.
- ▶ Sub-Saharan Africa (SSA) had the highest neonatal mortality rate in 2019 at 27 deaths per 1000 live births.
- ▶ Promoting skin-to-skin contact between mothers and infants is essential for enhancing the survival and well-being of newborns.

What are the new findings?

- ▶ Less than 50% of mothers practice skin-to-skin contact in SSA.
- ▶ Mothers of higher socioeconomic status are more likely to practice skin-to-skin contact compared with those of lower socioeconomic status.
- ▶ The likelihood of skin-to-skin contact is higher among women who had four or more antenatal care (ANC) visits compared with those who had no ANC visit.

What do the new findings imply?

- ▶ Our findings call for the need to intensify advocacy and strict supervision of the practice in SSA.
- ▶ Informal educational programmes can also be rolled out through various media platforms to sensitise the public and healthcare providers on the need for skin-to-skin contact.

INTRODUCTION

Since 1990, the global under-five mortality rate has decreased by nearly 59%, from 93 deaths per 1000 live births in 1990 to 38 deaths in 2019. As a result, more children reach adolescence today than they did in the 1990s. However, the burden of child mortality varies by region, with sub-Saharan Africa (SSA) bearing more than half (53%) of the burden.¹ Evidence from a review shows that about two-thirds of all neonatal deaths occur within the first day after birth, and more than three-quarters of deaths occur during the first



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week of life.² Regionally, SSA accounted for 42.0% of the global deaths among newborns in 2019, making it the region with the highest mortality rate at 27 deaths per 1000 live births and the only Sustainable Development Goal (SDG) region with no decline in the number of neonatal deaths since 1990.³ In other reports, preterm birth complications are the leading causes of death among children under the age of five, accounting for approximately 1 million deaths globally.⁴

Increased access to evidence-based interventions targeting the mother shortly before or during delivery, as well as those targeting the newborn baby, such as skin-to-skin contact, can significantly reduce preterm delivery-related deaths, particularly during the neonatal period.⁵ Skin-to-skin contact is an evidence-based intervention that signifies a situation whereby a newborn is positioned directly on the mother's abdomen or chest in order for them to have direct ventral-to-ventral skin contact.⁶ This means that the naked baby is placed directly on the mother's naked abdomen or chest. The WHO recommends that skin-to-skin contact should commence at least 1 hour after birth.⁶ Nevertheless, the act of skin-to-skin contact usually begins immediately after delivery to about 23 hours afterwards.⁷ Evidence shows that skin-to-skin contact has clinical efficacy and health benefits in a variety of settings. It assists in maintaining an optimum body temperature for the baby.⁸ Also, babies who receive early skin-to-skin care are more likely to benefit from early breast feeding initiation, to be exclusively breast fed after discharge, and to breast feed for longer durations.^{8–11} Literature also suggests that skin-to-skin contact is significantly associated with improved autonomic functioning and better cognitive control across the first 10 years of life.¹²

Despite the evidence, adoption and implementation of skin-to-skin contact in SSA has been limited and coverages have been low in most countries, ranging from 2% in Uganda through 10% in Nigeria and Ghana, to 36% in The Gambia.^{13–17} It has been documented that despite the WHO's recommendation for immediate or early skin-to-skin contact, separation of mother and newborn is common in most contexts.¹⁸ As such, there is the need to ascertain the prevalence of skin-to-skin contact. The few studies that investigated the reasons for the low uptake of skin-to-skin contact for newborns reported barriers such as a lack of nurses, a heavy workload, a lack of knowledge, time constraints, difficulty determining eligibility for skin-to-skin care, a lack of social support, a lack of guidelines, policies and cultural norms.^{19–21} A recent population-based cross-sectional study from The Gambia found that the place of delivery, place of residence and timing of antenatal care (ANC) booking were all determinants of skin-to-skin contact.¹³ There is, however, a scarcity of literature on the predictors of skin-to-skin contacts in SSA. The current study used nationally representative data from 17 sub-Saharan African countries to estimate the prevalence of skin-to-skin contact between mothers and their newborns, as well as the predictors.

Table 1 Description of study sample

Countries	Year of survey	Weighted N	Weighted %
Angola	2015–2016	8402	6.4
Benin	2018	8807	6.7
Burundi	2016–2017	7498	5.7
Cameroon	2018	6539	5.0
Ethiopia	2016	7582	5.8
Gambia	2019–2020	5338	4.1
Guinea	2018	5321	4.1
Liberia	2019–2020	3957	3.0
Mali	2018	6460	4.9
Malawi	2015–2016	13 430	10.3
Nigeria	2018	21 488	16.4
Sierra Leone	2019	6444	4.9
Tanzania	2015–2016	7050	5.4
Uganda	2016	10 070	7.7
South Africa	2016	1480	1.1
Zambia	2018	7269	5.5
Zimbabwe	2015	3959	3.0
All countries	2015–2020	131 094	100.0

METHODS

Data source and study design

We performed a cross-sectional analysis of data from the recent Demographic and Health Survey (DHS) conducted between 2015 and 2020 from 17 countries in SSA (table 1). Only these countries were selected because the outcome variable of interest was included in the DHS survey questionnaire from 2015 onwards. The data for the study were extracted from the kid's recode file (KR file) of the individual countries. The DHS is a nationally comparable representative survey conducted in over 85 low-income and middle-income countries across the globe since 1984.²² DHS is conducted every 5 years to evaluate health and social indicators such as maternal and child health including mother-to-child skin-to-skin contact. Respondents were sampled using a two-stage cluster sampling technique with a detailed sampling process highlighted in the literature.²³ Standardised questionnaires were used to collect data from the respondents. In the current study, we included 1 31 094 women who gave birth in the last 5 years preceding the survey in the final analysis (table 1). The datasets used in our study are freely available online (<https://dhsprogram.com/data/available-datasetscfm>).

Variables

Outcome variable

The outcome variable in our study was a mother and newborn skin-to-skin contact. With this variable, the women were asked the question 'Was child put on mother's chest and bare skin after birth'. The response options were 0=no; 1=put on chest, touching bare skin; 2=put on

chest, no touching of bare skin; 3=put on chest, do not know/missing on touching on bare skin; and 8=do not know. We recoded those who responded 'Put on chest, touching bare skin' as having 'skin-to-skin contact' while the remaining response options were categorised as 'not having skin-to-skin contact'. The categorisation and coding was informed by prior literature that used the DHS dataset.^{13 24}

Explanatory variables

The explanatory variables considered in this study were selected based on their parsimony and significant associations with mother and newborn skin-to-skin contact from literature,^{13 24–26} as well as their availability in the DHS dataset. In all, 18 explanatory variables were included. These variables were mainly categorised into individual and contextual level variables. The individual level variables included sex of the child, birth order and birth weight. It also included the type of delivery, type of birth, maternal age, maternal level of education, marital status and current working status. Also, included in the individual level variable was ANC attendance, place of delivery, health insurance coverage, exposure to watching television, listening to radio as well as reading newspaper or magazine. The contextual level variables included wealth index (ie, poorest, poorer, middle, richer and richest), place of residence (urban and rural) and the countries included in the study.

Statistical analyses

Data were cleaned to eliminate missing observations from the outcome and explanatory variables. We used percentages to summarise the prevalence of mother and newborn skin-to-skin contact. We examined the distribution of mother and newborn skin-to-skin contact across the explanatory variables using cross-tabulations. Further, the Pearson χ^2 test of independence was used to determine the independent association between mother and newborn skin-to-skin contact and the explanatory variables. All the variables that recorded a $p < 0.05$ from the χ^2 test were deemed significant and further placed in a multilevel regression analysis. To examine the strength of the association between mother and newborn skin-to-skin contact and the explanatory variables, we built four models (model 0–model III) to assess the effect of the individual and contextual level factors on skin-to-skin contact. Adjusted odds ratios (aORs) with their corresponding 95% confidence intervals (CIs) were used to present the results of the multilevel regression analysis. We checked for the model fitness and comparison using the Akaike Information Criterion. Due to the complex nature of the DHS dataset, we applied sampling weight (v005/1000000) in all the analyses. We used the Stata survey command 'svy' to correct for over and under-sampling and to improve the generalisability of the findings. The level of significance was set at $p < 0.05$ in the regression and χ^2 test. We performed all the analyses using Stata software V.16.0 (Stata Corporation). We

Table 2 Prevalence of mother and newborn skin-to-skin contact in sub-Saharan Africa

Countries	Mother and newborn skin-to-skin contact	
	Prevalence (%)	95% CI
Angola	47.7	46.6 to 48.8
Benin	75.1	74.1 to 76.0
Burundi	14.2	13.4 to 15.0
Cameroon	43.2	41.9 to 44.4
Ethiopia	23.9	22.9 to 24.9
Gambia	31.0	29.7 to 32.2
Guinea	23.1	21.9 to 24.2
Liberia	51.3	49.7 to 52.8
Mali	25.2	24.1 to 26.3
Malawi	64.7	63.9 to 65.5
Nigeria	11.7	11.2 to 12.1
Sierra Leone	60.8	59.6 to 62.0
Tanzania	31.2	30.2 to 32.3
Uganda	73.0	72.2 to 73.9
South Africa	63.6	61.1 to 66.0
Zambia	57.2	56.0 to 58.3
Zimbabwe	59.2	57.6 to 60.7
All countries	41.9	41.7 to 42.2

relied on the Strengthening the Reporting of Observational Studies in Epidemiology statement guidelines in drafting the manuscript.

Patient and public involvement

There was no patient or public involvement in this study.

RESULTS

Prevalence of mother and newborn skin-to-skin contact in sub-Saharan Africa

The results of [table 2](#) show that approximately 42% (41.7 to 42.2) of mothers practiced skin–skin contact in SSA. The highest prevalence was found in Benin (75.1% (74.1 to 76.0)), this was followed by Uganda (73.0% (72.2 to 73.9)) and the lowest prevalence in Nigeria (11.7% (11.2 to 12.1)). The range between the country with the highest prevalence and the country with the lowest prevalence was 63.4%.

Distribution of skin-to-skin contact across the explanatory variables

[Table 3](#) presents the distribution of skin-to-skin contact across the explanatory variables. There were significant differences in the distribution of skin-to-skin contact across all the explanatory variables except for sex of child. The prevalence of skin-to-skin contact was high among those born with low birth weight (53%), those with secondary or higher education (49.9%), those who have never been in a union (51.9%), those who attended four or more ANC visits (47.7%), those who delivered at a health facility (53.8%),

Table 3 Distribution of skin-to-skin contact across the explanatory variables

Variables	Weighted N	Weighted %	Mother and newborn skin-to-skin contact		
			No (%)	Yes (%)	P value
Sex of child					0.085
Male	66 741	50.9	58.4	41.6	
Female	64 353	49.1	57.8	42.2	
Birth order					<0.001
First	27 470	21.0	54.0	46.0	
Second	24 578	18.7	55.0	45.0	
Third	20 928	16.0	56.5	43.5	
Fourth	16 921	12.9	58.0	42.0	
Fifth or more	41 197	31.4	63.4	36.6	
Birth weight					<0.001
Normal (≥ 2.5 kg)	123 952	94.6	58.7	41.3	
Low birth weight (<2.5 kg)	7142	5.4	47.0	53.0	
Type of delivery					<0.001
Vaginal	124 374	94.9	57.1	42.9	
Caesarean section	6720	5.1	75.5	24.5	
Type of birth					<0.001
Single	128 468	98.0	58.0	42.0	
Multiple	2626	2.0	62.5	37.5	
Mother's age (years)					<0.001
15–19	9925	7.6	56.2	43.8	
20–24	29 787	22.7	54.9	45.1	
25–29	33 483	25.5	58.2	41.8	
30–34	26 312	20.1	57.9	42.1	
35–39	19 166	14.6	60.3	39.7	
40–44	9223	7.0	63.1	36.9	
45–49	3198	2.4	65.5	34.5	
Maternal educational level					<0.001
No education	48 163	36.8	69.5	30.5	
Primary	43 698	33.3	52.6	47.4	
Secondary or higher	39 233	29.9	50.1	49.9	
Marital status					<0.001
Never in union	9647	7.4	48.1	51.9	
Married	92 735	70.7	61.6	38.4	
Cohabiting	19 134	14.6	49.2	50.8	
Widowed	1787	1.4	57.7	42.3	
Divorced	2666	2.0	54.6	45.4	
Separated	5125	3.9	48.1	51.9	
Current working status					<0.001
No	44 199	33.7	59.3	40.7	
Yes	86 895	66.3	57.4	42.6	
ANC					<0.001
None	14 623	11.1	85.8	14.2	
1–3	39 820	30.4	59.0	41.0	
4 or more	76 651	58.5	52.3	47.7	

Continued

Table 3 Continued

Variables	Weighted N	Weighted %	Mother and newborn skin-to-skin contact		
			No (%)	Yes (%)	P value
Place of delivery					<0.001
Home	38 108	29.1	85.7	14.3	
Health facility	91 545	69.8	46.2	53.8	
Other	1441	1.1	81.5	18.5	
Health insurance coverage					<0.001
No	125 498	95.7	57.9	42.1	
Yes	5596	4.3	62.7	37.3	
Exposed to watching television					<0.001
No	98 639	75.2	60.2	39.8	
Yes	32 455	24.8	51.6	48.4	
Exposed to listening to radio					<0.001
No	86 791	66.2	61.4	38.6	
Yes	44 303	33.8	51.6	48.4	
Exposed to reading newspaper/magazine					<0.001
No	123 517	94.2	59.2	40.8	
Yes	7577	5.8	39.0	61.0	
Wealth index					<0.001
Poorest	28 165	21.5	65.7	34.3	
Poorer	28 021	21.4	62.7	37.3	
Middle	26 304	20.1	59.1	40.9	
Richer	25 322	19.3	52.6	47.4	
Richest	23 282	17.7	48.0	52.0	
Place of residence					<0.001
Urban	44 686	34.1	51.5	48.5	
Rural	86 408	65.9	61.4	38.6	
Geographical subregions					<0.001
Southern	12 708	9.7	41.5	58.5	
Central	14 941	11.4	54.3	45.7	
Eastern	45 631	34.8	53.7	46.3	
Western	57 814	44.1	66.1	33.9	

*P values were generated from the χ^2 test.
ANC, antenatal care.

those who reported reading newspapers/magazines (61%), and those in the richest wealth index (52%).

Fixed and random effect analyses of the predictors of skin-to-skin contacts in sub-Saharan Africa

Fixed effects

Table 4 shows the fixed effect results of the predictors of skin-to-skin contact. Compared with first order births, children of third order births had higher odds of skin-to-skin contact (aOR=1.12; 95% CI 1.04 to 1.19). The likelihood of skin-to-skin contact was higher among women covered by health insurance (aOR=1.15; 95% CI 1.05 to 1.27), those who delivered in health facilities (aOR=6.11; 95% CI 5.71 to 6.54), those exposed to newspapers/magazines (aOR=1.29; 95% CI

1.19 to 1.40), those exposed to listening to radio (aOR=1.07; 95% CI 1.03 to 1.12), and among children born low birth weight (aOR=1.09; 95% CI 1.01 to 1.17). Compared with women in the poorest wealth index, the odds of skin-to-skin contact was higher among those in the richer (aOR=1.18; 95% CI 1.10 to 1.27) and richest wealth indexes (aOR=1.28; 95% CI 1.17 to 1.40). The results from table 4 show that the likelihood of skin-to-skin contact was higher among women who attended 1–3 ANC visits (aOR=1.36; 95% CI 1.23 to 1.50) and 4 or more ANC visits (aOR=1.59; 95% CI 1.44 to 1.76). Also, compared with women with no education, those with primary education (aOR=1.07; 95% CI 1.02 to 1.12) and secondary or higher education (aOR=1.12; 95%

Table 4 Fixed and random effect analysis of predictors of skin-to-skin contact in sub-Saharan Africa

Variables	Model 0	Model I aOR (95% CI)	Model II aOR (95% CI)	Model III aOR (95% CI)
Fixed-effect results				
Birth order				
First		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Second		1.14*** (1.08 to 1.20)		1.09** (1.03 to 1.15)
Third		1.19*** (1.11 to 1.26)		1.12** (1.04 to 1.19)
Fourth		1.18*** (1.10 to 1.27)		1.10* (1.02 to 1.19)
Fifth or more		1.13** (1.05 to 1.22)		1.09* (1.01 to 1.18)
Birth weight				
Normal (≥2.5 kg)		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Low birth weight (<2.5 kg)		1.13*** (1.06 to 1.21)		1.09* (1.01 to 1.17)
Type of delivery				
Vaginal		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Caesarean section		0.21*** (0.20 to 0.24)		0.15*** (0.13 to 0.16)
Type of birth				
Single		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Multiple		0.82*** (0.73 to 0.92)		0.76*** (0.67 to 0.86)
Mother's age (years)				
15–19		1 (1.00 to 1.00)		1 (1.00 to 1.00)
20–24		1.00 (0.94 to 1.07)		1.01 (0.94 to 1.08)
25–29		0.95 (0.88 to 1.02)		0.98 (0.90 to 1.06)
30–34		1.03 (0.95 to 1.12)		1.06 (0.97 to 1.15)
35–39		1.00 (0.92 to 1.09)		1.01 (0.92 to 1.11)
40–44		0.95 (0.86 to 1.05)		0.95 (0.86 to 1.06)
45–49		0.96 (0.84 to 1.10)		0.94 (0.82 to 1.08)
Maternal educational level				
No education		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Primary		1.42*** (1.35 to 1.49)		1.07** (1.02 to 1.12)
Secondary or higher		1.44*** (1.36 to 1.52)		1.12*** (1.06 to 1.19)
Marital status				
Never in union		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Married		0.74*** (0.69 to 0.79)		0.99 (0.92 to 1.07)
Cohabiting		1.11** (1.03 to 1.21)		0.94 (0.87 to 1.03)
Widowed		0.83** (0.72 to 0.96)		1.02 (0.87 to 1.18)
Divorced		0.81** (0.72 to 0.92)		0.98 (0.86 to 1.12)
Separated		1.07 (0.97 to 1.18)		0.97 (0.88 to 1.08)
Current working status				
No		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Yes		1.00 (0.96 to 1.04)		0.98 (0.94 to 1.03)
ANC				
None		1 (1.00 to 1.00)		1 (1.00 to 1.00)
1–3		1.48*** (1.34 to 1.63)		1.36*** (1.23 to 1.50)
4 or more		1.76*** (1.60 to 1.93)		1.59*** (1.44 to 1.76)
Place of delivery				
Home		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Health facility		6.73*** (6.28 to 7.20)		6.11*** (5.71 to 6.54)
Other		1.35*** (1.14 to 1.59)		0.86 (0.72 to 1.04)
Health insurance coverage				

Continued

Table 4 Continued

Variables	Model 0	Model I aOR (95% CI)	Model II aOR (95% CI)	Model III aOR (95% CI)
No		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Yes		0.55*** (0.50 to 0.61)		1.15** (1.05 to 1.27)
Exposed to reading newspaper/magazine				
No		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Yes		1.58*** (1.46 to 1.71)		1.29*** (1.19 to 1.40)
Exposed to listening radio				
No		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Yes		1.19*** (1.14 to 1.24)		1.07** (1.03 to 1.12)
Exposed to watching television				
No		1 (1.00 to 1.00)		1 (1.00 to 1.00)
Yes		0.98 (0.92 to 1.03)		1.05 (0.99 to 1.11)
Wealth index				
Poorest			1 (1.00 to 1.00)	1 (1.00 to 1.00)
Poorer			1.18*** (1.12 to 1.24)	1.02 (0.96 to 1.08)
Middle			1.37*** (1.29 to 1.46)	1.03 (0.97 to 1.10)
Richer			1.74*** (1.62 to 1.87)	1.18*** (1.10 to 1.27)
Richest			2.09*** (1.93 to 2.28)	1.28*** (1.17 to 1.40)
Place of residence				
Urban			1 (1.00 to 1.00)	1 (1.00 to 1.00)
Rural			0.79*** (0.74 to 0.86)	0.93* (0.86 to 0.99)
Random effect results				
PSU variance (95% CI)	0.68 (0.55 to 0.84)	1.03 (0.83 to 1.29)	0.17 (0.13 to 0.22)	0.20 (0.15 to 0.25)
ICC	0.17	0.24	0.05	0.06
Wald χ^2	Reference	5220.47***	6339.22***	9329.47***
Model fitness				
Log-likelihood	-87325.69	-74997.35	-72592.07	-65348.40
AIC	174655.4	150056.7	145230.1	130800.8
N	131094	131094	131094	131094
Number of clusters	1399	1399	1399	1399

Exponentiated coefficients; 95% CIs in parentheses.

Model II and III were controlled for countries.

* $P < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

1, reference category; AIC, Akaike's information criterion; ANC, antenatal care; aOR, adjusted OR; ICC, intraclass correlation; PSU, primary sampling unit.

CI 1.06 to 1.19) reported significantly higher odds of skin-to-skin contact. Conversely, the odds of skin-to-skin contact was low among women in rural residences (aOR=0.93; 95% CI 0.86 to 0.99), those who delivered by caesarean section (aOR=0.15; 95% CI 0.13 to 0.16) and those with multiple births (aOR=0.76; 95% CI 0.67 to 0.86).

Random effects

Model III was considered the model of best fit for predicting the mother and newborn skin-to-skin contact in SSA. This model explained 6% of the observed variations (intraclass correlation=0.06). The percentage of variance explained at the empty model was 0.17 which increased to 0.24 in model I, but decreased to 0.05 in model II (table 4).

DISCUSSION

To accelerate action in SSA towards the attainment of SDG target 3.2 which seeks to reduce neonatal mortality to 12 deaths per 1000 live births by 2030,²⁷ it is imperative to explore all proven measures that aim at reducing deaths among neonates and promoting such interventions. As iterated by previous studies, skin-to-skin contact is necessary for promoting early breast feeding initiation, exclusive breast feeding for babies after the mother has been discharged, and longer durations.⁸⁻¹¹ This is essential to enhancing the autonomic functioning, better cognitive control of the child as well as guaranteeing child survivorship.¹² Therefore, the importance of skin-to-skin contact in the reducing neonatal mortality cannot be disputed. As such, the current study sought to estimate

the prevalence and determine the predictors of skin-to-skin contact in SSA.

Overall, the prevalence of mother and newborn skin-to-skin contact was approximately 42%. Noteworthy, skin-to-skin contact forms an essential component of care provided to newborns. It is recommended that skin-to-skin contact should be provided to all regardless of any other parameter.⁶ Therefore, a prevalence of 42% indicates low prevalence. This prevalence varied among the respective countries with Benin reporting the highest prevalence (75.1%) whereas Nigeria reported the least prevalence of skin-to-skin contact (11.7%). The observed low prevalence of skin-to-skin contact in Nigeria is slightly higher than what was reported (10%) by Singh *et al*,¹⁶ but corroborates the prevalence reported in a study by Ekholuenetale *et al*.²⁴ A qualitative study conducted in Nigeria revealed that mothers perceived skin-to-skin contact as not important for keeping newborns warm after birth.²⁸ Hence, these mothers are less likely to practice skin-to-skin contact. This may explain the observed low prevalence of skin-to-skin in Nigeria. It is uncertain why Benin reported the highest prevalence of skin-to-skin contact. Probably, the results may be a reflection of the cultural beliefs that Beninese have concerning newborn care.

The present study shows that delivering in a health facility was associated with a six times greater likelihood of experiencing mother and newborn skin-to-skin contact. This is consistent with evidence from The Gambia,¹³ Ethiopia²⁹ and Nigeria,²⁴ that found higher odds of mother and newborn skin-to-skin contact among women who delivered at a health facility as compared with those who delivered at home. It is noteworthy that, delivery in a health facility significantly rests on the availability of skilled birth attendants (SBAs) who have been trained to ensure that mothers comply with best maternal and neonatal practices.^{30 31} Thus, it is highly plausible that at the health facility, women who deliver are more likely to be educated about the relevance of skin-to-skin contact to both the mother and the survival of the newborn and supported to practice skin-to-skin contact compared with those who deliver at home without assistance from an SBA.

Contrary to a related study in Nigeria that found no significant association between health insurance coverage and skin-to-skin contact,²⁸ we found that mothers who were covered by health insurance were more likely to practice and experience mother and newborn skin-to-skin contact. This is reflective of our early findings that health facility delivery is associated with greater odds of mother and newborn skin-to-skin contact. Health insurance reduces, if not eliminates the financial barrier caused by out-of-pocket payments.³² As such, mothers have the option of having institutional birth delivery, where they are more likely to be exposed to SBAs and health education officers who would tell them about the significance of mother-to-child skin-to-skin contact.

The odds of mother and newborn skin-to-skin contact was high among those who read newspapers/magazines

and those who listened to radio as compared with those who were not exposed to any of these media. The result is analogous to the findings of Ekholuenetale *et al*.²⁴ According to Shamba *et al*,²⁰ mothers will be willing to practice skin-to-skin contact with the newborns after birth when they are aware of this practice and its concomitant benefits. Exposure to the media provides the avenue for mothers to be exposed to information about skin-to-skin contacts, which helps to demystify and clear existing prejudice and misperceptions about the practice.

Concerning the association between wealth index and mothers' skin-to-skin contact with their newborns, we found the odds to increase with higher wealth index. Thus, mothers in the richest wealth index were more likely to have skin-to-skin contact with their newborns immediately after childbirth compared with mothers in the poorest wealth index. Similar finding was reported in a related study in Nigeria.²⁴ Studies have shown that mothers in higher wealth index are more likely to exhibit better health seeking behaviours, including having institutional births and attending more ANC follow-up visits,^{33 34} thereby raising their awareness about skin-to-skin contact and its benefits.

We also found that mothers with formal education were more likely than those with no formal education to practice skin-to-skin contact with their newborns immediately after birth. Our findings align with previous studies conducted in Nigeria and Ethiopia.^{24 25} This could be explained by the fact that educated mothers are usually empowered and capable of making independent decisions; hence, they can request this service even if their partners and the wider culture are against it. They are also more likely to be aware of the benefits of skin-to-skin contact, discuss it with their healthcare professionals, and request it.²⁴

The results of this study show that mothers are more likely to practice skin-to-skin contact with their newborns after birth when they complete more ANC visits. This is synonymous to previous studies.^{13 24 25} ANC provides an opportunity for mothers to receive sufficient counselling and information to prepare them for delivery. This counselling and information received have also been reported in other studies to significantly predict the odds of mother and newborn skin-to-skin contact.³⁵ Therefore, the more ANC visits a mother attends, the more likely she will get counselling and knowledge that will help her accept and practice skin-to-skin contact.

Compared with first order births, all other birth orders were associated with significantly higher odds of skin-to-skin contacts. Also, the odds of practicing mother and newborn skin-to-skin contact was high among mothers who had low birth weight children. This finding mirrors the results of a related study.²⁴ It is unclear why higher-order deliveries are linked to more skin-to-skin contact between the mother and the newborn than first-order births. However, it is plausible to say that higher birth order is likely to increase women's risk of poor pregnancy outcomes, such as preterm birth, small gestation for age

and low birth weight, all of which may necessitate skin-to-skin contact to increase survival.³⁶

Synonymous to other newborn care practices,³⁷ mothers who have had multiple birth had lower odds of practicing skin-to-skin contact with their newborn. A plausible explanation could be that, these women may assume that they have sufficient experience with birthing. Hence, they become highly non-compliant to health promotive newborn practices. Consistent with previous studies,^{13 26} our findings suggest that women who lived in rural residence reported lower odds of practicing skin-to-skin contact with their newborns. This association may largely be influenced by the preponderance of health facilities and services in urban areas.²⁶ This study also revealed that the likelihood of practicing skin-to-skin contact was lower among women who delivered by caesarean section. According to Ekholuenetale *et al*,²⁴ mothers who undergo caesarean section may experience discomfort and pain. Sometimes, the woman may be separated from the child immediately after birth to allow her heal, which significantly reduces her chances of engaging in skin-to-skin contact.

Policy implications

Our study underscores the importance of promoting health facility/institutional delivery. The results from this study call on governments and health departments in the respective sub-Saharan African countries to improve the implementation of existing health insurance schemes and policies in order to stimulate higher prevalence of mother and newborn skin-to-skin contact. Countries within the subregion with no free maternal health policies should consider implementing such policies as that could be critical to increasing ANC attendance, which is vital to promoting mother and newborn skin-to-skin contact in SSA. Also, our findings highlight the need to integrate health education messages about the importance of skin-to-skin contact throughout the continuum of maternal healthcare.

Strength and limitations

The study used the most recent DHS data for the respective countries. These data were from a nationally representative population-based survey, thereby making our findings generalisable to mothers and newborns in SSA. Notwithstanding, the cross-sectional design of the DHS limits our analysis. We are unable to make causal inferences on the predictors of mother and newborn skin-to-skin contact. Also, the DHS data were collected retrospectively as such, there is the potential of recall bias which is beyond our control. Our analysis was also limited to variables within the dataset. As such, important health policy-related factors that direct implications for promoting mother and child skin-to-skin contact could not be assessed. Additionally, the analysis was limited to only variables with complete observations as missing observations were dropped and this may have impact on the findings of the study.

CONCLUSION

The prevalence of mother and newborn skin-to-skin contact was low in this study. Several factors including health facility delivery, rural residency, birth order, birth weight, health insurance coverage, type of delivery, type of birth, maternal educational level, ANC attendance, exposure to media and wealth index were associated with the practice of skin-to-skin contact. Considering that less than half of the surveyed women practiced skin-to-skin contact, it is expedient for intensification of advocacy and strict supervision of the practice within the included countries. Informal educational programmes can also be rolled out through various media platforms to sensitise the public and healthcare providers on the need for skin-to-skin contact. These will help maximise the full benefits of skin-to-skin contact and expedite prospects of achieving the SDG targets 3.1 and 3.2.

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