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Impact of the Level of Maternal Education on Maternal and Newborn Health in Nigeria

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Abstract

Cross-sectional studies have shown a number of factors that impact maternal health, including socioeconomic status, health-seeking behaviours, and education. The objective of this study was to establish the impact of maternal education on maternal and newborn health in Nigeria. The design adopted for this study was retrospective. The 2018 NDHS and global data were used as primary sources for the study. Predictive factors responsible for good health indicators were considered for all the states in Nigeria. The educational status of the mother and utilization of maternal and newborn health services were considered for analysis. The result showed a strong link between maternal education and maternal health in Nigeria, just as it exists in other parts of the world. It was concluded that maternal education knits many social parts together and creates a whole piece of interaction, creating a better health outcome. Literate women were more likely to deliver in health care facilities under the supervision of skilled birth attendants. They are also more likely to present themselves and their newborns for postnatal care. The benefits of maternal education extend beyond just the direct recipients of the education; children also benefit from maternal schooling as maternal education significantly reduces the risk of not accessing maternal and newborn health services. Therefore, more attention should be given to girl-child education as a strong social determinant of health when devising strategies to reduce maternal mortality and to achieve universal health coverage in Safe Motherhood.

Keywords: Education, maternal education, maternal health and newborn health.

Introduction

Maternal and newborn deaths affect quite a large population globally, especially in Sub-Saharan African countries. Maternal and child health were the focus of MDG 5 and 4 respectively. The MDGs ended in 2015 with only two African

countries (Rwanda and Ethiopia) achieving these two MDGs ¹. Though Nigeria failed to meet MDGs 4 and 5, maternal mortality was reduced from 1000/100,000 live births in 1990 to 576,000/100,000 live births in 2010, with some improvement in newborn health ². However, if the milestones achieved and the foundation laid were to be sustained by the Sustainable Development Goals (SDGs) which the United Nations rolled out in mid-2015, Nigeria must address health issues using a multi-sectoral approach, including appropriate consideration for non-medical causes of morbidity and mortality.

There are numerous factors affecting maternal and newborn health. They can be broadly sub-divided into medical and non-medical factors. Education as a non-medical and clinical factor is given attention in this study. The study elucidated how related maternal education is to maternal and newborn health. Therefore, the main objective of this research is to assess the impact of the level of maternal education on maternal and newborn health. However, the following questions guided the study, namely: How does the educational attainment of women affect maternal and newborn health? What is the relationship between the level of maternal education and pregnancy outcome? Is there a causal association between a mother's level of education and the health of the newborn?

Education involves a trajectory of activities that focus on imparting and acquiring knowledge through teaching and learning, especially at schools or similar institutions. Education could be formal or informal. Formal education is in a structured system using curricula that is classroom-based and provided by trained tutors, while informal education is outside this structured system. Such places outside this structured system include those at home with parents, community-based and religious bodies. According to the internet-based Etymology Dictionary, education, therefore, can be defined as the process of facilitating learning, or the acquisition of knowledge, skills, values, morals and beliefs. It is a method of learning knowledge, skills, culture, beliefs, and values of a group of people, or a method of living or patterns of living. Knowledge is transferred from one person or generation to another through discussion, teaching, training or research.

Moreover, education is a human developmental index that determines the literacy level of adults in a country. With a higher education, an individual is expected to earn more. The educational level of people in a society or country, therefore, has been linked to several factors affecting human life and existence. The inter-sectoral concepts that contribute to understanding of health and health equity note that it is impossible to discuss health without considering the social determinants of health (SDOH), including level of education ³; ⁴. In

¹Adeyanju, Oludamilola, Sandy Tubeuf, and Tim Ensor, 'Socio-Economic Inequalities in Access to Maternal and Child Healthcare in Nigeria: Changes over Time and Decomposition Analysis', 32, 8, PP 1111-18

²Ahmed S, Creanga AA, Duff GG, et al. 'Economic Status, Education and Empowerment: Implications for Maternal Health Service Utilization in Developing Countries'.

³Adeyanju, Oludamilola, Sandy Tubeuf, and Tim Ensor, 'Socio-Economic Inequalities in Access to Maternal and Child Healthcare in Nigeria: Changes over Time and Decomposition Analysis', 32 (8): 1111-18.

another literature on SDOH, it was estimated to influence up to 80% of all health outcomes and play a crucial role in creating and perpetuating health disparities owing to the way in which broad societal systems and institutional structures lead to inequitable access to protective factors, like education, and an inequitable burden of harmful ones. A study further reported that education provides tangible benefits, including employment opportunities and knowledge that can improve both the quality and duration of one's life⁵. Some other studies corroborate the fact that girls who complete primary and secondary education tend to marry later, have smaller families, and earn significantly higher wages⁵. Comparative analysis of data from some African countries, of non-educated and educated women showed a substantial difference in infection rates^{6,7}.

Educating a girl can therefore, change her destiny as well as those of her future children, and ensures that she can contribute to the economic life of her community⁸. For over a decade, education for girls has been identified as one of the best solutions to reversing the relentless trend of poverty and disease devastating large population in the sub-Saharan Africa. It is on this basis that Organisation for Economic Co-operation and Development (OECD) ranked many countries based on educational status. Table 1 shows top countries with high educational index.

Table 1: OECD Ranking of countries according to Education Index

Country	OECD Ranking	Education index
Finland	1	0.993
Greece	10	0.98
Iceland	10	0.98
Sweden	15	0.974

⁴Ahmed S, Creanga AA, Duff GG. et al. 'Economic Status, Education and Empowerment: Implications for Maternal Health Service Utilization in Developing Countries'.

⁵Bauserman M, Vanessa RT, Tracy LN. et al. 'Maternal Mortality in Six Low and Lower-Middle Income Countries from 2010 to 2018: Risk Factors and Trends', 17, No 3.

⁶Ensor T and Stephanie C, 'Overcoming Barriers to Health Service Access: Influencing the Demand Side', 19, No 2, PP 69-79.

⁷Federal Ministry of Health. 'Final Report on MDG 2015. UN Sustainable Development Goals'.

⁸Hahn RA and Benedict IT. 'Education Improves Public Health and Promotes Health Equity', 45, No 4, PP 657-78.

Italy	22	0.965
Estonia	23	0.964
Austria	24	0.962
Poland	32	0.952
Japan	33	0.949
Singapore	97	0.843
Nigeria	141	0.648
Chad Republic	174	0.293

Source: Education Index. In: Michalos A.C. (eds) Encyclopedia of Quality of Life and Well-Being Research, 2014.

Education index is proxied by the adult literacy rate and the combined primary, secondary, and tertiary gross enrolment ratios. Developed countries scored above 0.8, with most of them scoring above 0.9. Countries with high educational index, above 0.8, have consistently shown low maternal mortality ratio⁹. The concept of maternal education or literacy, defined as the cognitive and social skills that determine the motivation and ability of woman to gain access to, understands, and uses information in ways that promote and maintain her health and by implication, her child^{10,11}. However, it is generally agreed that maternal education must include antenatal education, childbirth parenting knowledge and skills acquisition, empowerment, health education and general health literacy¹².

⁹Saisana M. 'Education Index. In: Michalos A.C. (Eds) Encyclopedia of Quality of Life and Well-Being Research'

¹⁰Ensor T and Stephanie C. 2004. 'Overcoming Barriers to Health Service Access: Influencing the Demand Side', 19, No 2, PP 69-79.

¹¹Banke-Thomas OE, Aduragbemi OB, et al. 'Factors Influencing Utilisation of Maternal Health Services by Adolescent Mothers in Low-and Middle-Income Countries: A Systematic Review', 17, No 1, P 65.

¹²Banke-Thomas OE, Aduragbemi OB, et al. 'Factors Influencing Utilisation of Maternal Health Services by Adolescent Mothers in Low-and Middle-Income Countries: A Systematic Review', 17, No 1, P 65.

Four elements that have been identified as essential to maternal death prevention are all influenced by maternal education¹³. The first is the prenatal care which is recommended that expectant mothers receive at least eight antenatal visits to check and monitor the health of mothers and fetuses. The second involved women availing themselves with skilled birth attendance where health personnel such as doctors, nurses and or midwives who have the skills to manage normal deliveries and recognize the onset of complications are available to provide emergency care during childbirth or immediately after delivery¹⁴. Third, emergency obstetric care to address the major medical causes of maternal death which are hemorrhage, sepsis, unsafe abortion, hypertensive disorders, and obstructed labour. The fourth is the postnatal care attendance of sixth week following delivery. In the light of this, maternal education provides empowerment and competence for the uptake of the strongly recommended aforementioned services.

Maternal and Newborn Health

Health, according to the World Health Organization (WHO), is defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"¹⁵. The apparent fullness of this definition carries a powerful intuitive appeal that shows a comprehensive definition of health covering all aspects of life. However, the WHO definition has been the target of criticism in the medical literature since its first appearance in 1948. This means that health is a resource to support an individual's function in wider society, rather than an end in itself. Meanwhile, the term newborn refers to the neonatal period of life, which is the first 28 days of life, whereas perinatal means around the time of childbirth; relating to or occurring during the period around childbirth, specifically from around 28 weeks of pregnancy to 28 days after childbirth¹⁶.

"Maternal Mortality is the death of a woman while being pregnant or within 42 days of termination of pregnancy, regardless of the duration and site of the pregnancy, from any cause related to or worsened by the pregnancy or its management aside accidental or incidental causes"¹⁷. The circumstances of a mother, her unborn child, the immediate environment go a long way to determine the outcome of the pregnancy in terms of morbidity and mortality. Maternal and newborn health is closely linked. Nearly 2.5 million children die in the first month of life every year and additional 2.6 million babies are stillborn¹⁸. Socioeconomic status, politics, war, insurgency, dietary intake and other factors have effects on pregnancy outcomes and motherhood as well as lifelong effects on the unborn. A mother's level of education and knowledge may

¹³Toure K, Sankore R, Kuruvilla S, et al. 'Positioning Women's and Children's Health in African Union Policy-Making: A Policy Analysis', 8, No 1: 3.

¹⁴FMOH 2018, Maternal and New born Deaths Surveillance and Response National Guidelines.

¹⁵World Health Organization. Health promotion: a discussion document.

¹⁶Okonofua F, Ntoimo L, Ogu R, et al. Prevalence and determinants of stillbirth in Nigerian referral hospitals: a multicentre study, 19.

¹⁷Galadanci H, Wolfgang K, Robert Z et al. 'Experiences of 6 Years Quality Assurance in Obstetrics in Nigeria - a Critical Review of Results and Obstacles', 44, No 3, PP 301-8

¹⁸National Bureau of Statistic. 'MDG Assessment Report'.

go a long way to partly determine the outcome of these processes of motherhood¹⁹; ²⁰

Globally, maternal mortality is higher in developing countries with poor socio-economic means as almost all maternal deaths (94%) occurred in low-income and lower-middle-income countries. The high number of maternal deaths in some part of the world, especially Sub-Saharan Africa (SSA), reflects inequities in access to health services and highlights the gap between rich and poor²¹. Evidence suggests that in Nigeria, inequalities in access to quality services continue to persist with maternal access to skilled assistance during delivery having the highest levels of inequalities²². Two main predictors that will be considered are Economic Status and Health Seeking Behaviors. It is now widely recognized that health outcomes are deeply influenced by a variety of social factors outside health care. The dramatic differences in morbidity, mortality and risk factors that have been documented within and between countries are patterned after classic social determinants of health such as education, income as well as social environment in which people live and the macro-structural policies that shape them²³.

The medical causes of maternal and new born mortality in Nigeria include 5 major complications which are haemorrhage, infections, unsafe abortions, hypertensive diseases of pregnancy and obstructed labor. For example, life threatening obstetric hemorrhage occurs in approximately 1 per 1000 deliveries. However, the figure is higher in Nigeria than elsewhere. National survey showed that Eclampsia contributed 13% in all obstetric complication of pregnancy and 16.7% of death in public sector referral facilities²⁴; ²⁵

Gannon, while reporting maternal mortality in Chile from 1957 to 2007 using parallel time series data revealed that the maternal rate of mortality reduced by 70% between 1946 and 1953 when women started getting maternal education in Chile shown in table 2. Also, in a review of maternal mortality in six low and lower-middle income countries from 2010 to 2018, risk factors and trends

¹⁹Okonofua F, Ntoimo L, Ogu R, et al. Prevalence and determinants of stillbirth in Nigerian referral hospitals: a multicentre study, 19,

²⁰Ketema DB, Cheru TL, Getye DK et al. 'Effects of Maternal Education on Birth Preparedness and Complication Readiness among Ethiopian Pregnant Women: A Systematic Review and Meta-Analysis', BMC Pregnancy and Childbirth 20; No1, P14.

²¹Kabo I, Otolorin E, Williams E et al. Monitoring maternal and newborn health outcomes in Bauchi State, Nigeria: An evaluation of a standards-based quality improvement intervention, 28.

²²Adeyanju, Oludamilola, Sandy Tubeuf, and Tim Ensor. 'Socio-Economic Inequalities in Access to Maternal and Child Healthcare in Nigeria: Changes over Time and Decomposition Analysis', 32 (8): 1111-18

²³NwosuCO and Ataguba JE. 'Socioeconomic Inequalities in Maternal Health Service Utilisation: A Case of Antenatal Care in Nigeria Using a Decomposition Approach', 19, No 1, P. 1493

²⁴FMOH 2018, Maternal and New born Deaths Surveillance and Response National Guidelines.

²⁵FMOH 2021, Live Saving Skills Manual for Nurses

showed the importance of education in improving maternal health and reducing maternal deaths as shown in this paper ²⁶

Table 2: Parallel Time Series of the co-variables assessed in the Study on Maternal Mortality in Chile from 1957 to 2007.

Year	TFR	Primiparous (%)	Primiparous >29 years (%)	Education, years ¹	Skilled attendants (%)	GDP per capita (US\$)	Clean water (%)	Sanitary sewer (%)
1957	5.0	23.9	3.0	3.57	60.8	4,250	25.5	12.1
1958	5.0	23.1	3.0	3.43	62.4	4,376	29.2	13.9
1959	4.8	23.0	3.2	4.31	59.8	4,091	32.8	15.6
1960	5.0	23.3	3.3	3.57	66.9	4,265	36.3	16.7
1961	5.1	22.9	3.0	3.14	69.7	4,354	39.7	17.9
1962	5.1	23.2	3.1	3.98	72.1	4,447	43.0	19.4
1963	5.0	22.7	2.7	4.40	72.3	4,613	44.8	21.3
1964	4.6	22.8	2.8	4.43	73.0	4,604	49.2	23.4
1965	4.6	24.2	2.8	3.91	74.3	4,533	53.5	25.4
1966	4.3	25.4	2.8	4.63	75.5	4,933	56.3	26.0
1967	3.8	27.1	2.9	4.60	77.3	4,989	59.1	26.8
1968	3.8	28.3	2.9	5.07	78.0	5,064	61.7	27.8
1969	3.3	29.9	3.1	5.76	80.0	5,149	64.1	29.5
1970	3.4	31.1	3.1	5.53	81.1	5,154	66.5	31.1
1971	3.3	31.8	3.2	6.95	83.6	5,518	67.2	33.0
1972	3.3	33.3	3.4	7.29	85.0	5,358	67.9	34.8
1973	3.6	34.5	3.3	7.29	85.1	4,975	68.6	36.5
1974	3.5	34.0	3.3	7.31	86.4	4,941	69.2	38.2
1975	3.2	35.4	3.3	7.26	87.4	4,233	77.4	43.5
1976	2.7	36.6	3.3	8.20	87.1	4,319	78.2	51.5
1977	2.7	38.4	3.4	8.44	89.0	4,578	82.6	55.9
1978	2.4	40.1	3.5	8.31	89.6	4,991	86.0	56.3
1979	2.4	40.4	3.4	8.49	90.4	5,330	90.1	62.4
1980	2.5	40.6	3.3	8.40	91.4	5,675	91.4	67.4

²⁶Bauserman M, Vanessa RT, Tracy LN, et al. 'Maternal Mortality in Six Low and Lower-Middle Income Countries from 2010 to 2018: Risk Factors and Trends', 17, No 3, 173.

1981	26	40.2	3.3	8.43	92.2	5,929	91.5	68.2
1982	26	38.8	3.2	8.56	94.2	5,041	92.1	70.8
1983	26	38.4	3.3	8.67	95.2	4,822	92.7	70.6
1984	25	39.0	3.3	8.86	96.7	5,027	94.3	72.9
1985	25	39.8	3.4	9.04	97.4	5,047	95.2	75.1
1986	25	40.8	3.6	8.90	97.7	5,241	97.0	77.2
1987	25	41.0	3.7	8.95	98.1	5,484	97.2	78.8
1988	27	41.1	3.9	9.07	98.4	5,787	98.0	80.8
1989	27	41.0	4.0	9.18	98.8	6,293	98.2	81.5
1990	27	40.5	4.2	9.14	99.1	6,424	97.4	82.6
1991	26	39.8	4.4	9.17	99.2	6,807	95.3	86.2
1992	25	39.5	4.4	10.06	99.2	7,500	97.5	84.7
1993	25	39.9	4.6	10.12	99.4	7,882	98.0	86.4
1994	24	40.4	4.8	10.17	99.5	8,188	98.5	87.9
1995	24	41.0	4.8	10.33	99.5	8,895	98.6	89.4
1996	23	41.5	5.0	10.61	99.6	9,419	98.9	90.4
1997	23	41.8	5.2	10.43	99.6	9,925	99.3	91.0
1998	23	41.6	5.2	10.63	99.7	10,091	99.2	91.5
1999	22	41.5	5.4	10.83	99.7	9,885	99.2	92.1
2000	21	41.5	5.5	11.02	99.0	10,191	99.6	93.1
2001	20	41.8	5.7	11.09	99.7	10,415	99.7	93.6
2002	20	41.6	5.9	11.25	99.8	10,523	99.7	94.1
2003	19	40.9	6.2	11.38	99.7	10,620	99.8	94.7
2004	19	41.2	6.5	11.57	99.8	11,343	99.7	95.0
2005	19	43.5	7.5	11.70	99.8	11,863	99.8	94.9

Table 3: Maternal characteristics by maternal status at 42 days after delivery, 2010–2018 all clusters

Characteristic ^a	N(%) by maternal status		Total
	Women who died	Women alive six weeks after delivery	
Deliveries, N	842	570,479	571,321
Maternal age	839	569,478	570,317
<20	65 (7.7)	71,758 (12.6)	71,823 (12.6)
20–35	695 (82.8)	471,940 (82.9)	472,635 (82.9)
>35	79 (9.4)	25,780 (4.5)	25,859 (4.5)
Maternal education	841	568,765	569,606
No formal education	360 (42.8)	137,325 (24.1)	137,685 (24.2)
Primary/Secondary	458 (54.5)	391,879 (68.9)	392,337 (68.9)
University +	23 (2.7)	39,561 (7.0)	39,584 (6.9)

Source: *Reproductive Health*, (2020)

Methodology

This is a retrospective study that used data from Nigeria Demographic and Health Survey, 2018. All cases of maternal and new born morbidity and mortality for 2018 were considered for the study. An eligible sample of 14,103 women who had live births within 2 years preceding the survey were included in the analysis while 12,566 children born within the same period were also included. Moreover, the Z test with 95% confidence interval was used for data analysis.

The results were presented in tables and graphs. The outcome of the pregnancies was considered with maternal bio-data which included the educational status, place of delivery, Skilled Birth Attendance (SBA) at delivery, uptake of Postnatal Care (PNC) for the mother and newborn. Other data extracted from the NDHS 2018 for the newborn were the records of Respiratory Tract Infection (RTI) and whether or not the mother sought advice or treatment for the RTI. Where the mother sought advice or treatment, how long after the onset of RTI symptoms the intervention occurred were also extracted.

The population size was thought out to be large considering the data source used. All pregnancies that resulted live births in 2018 NDHS data were used. This put into perspective the population that was captured in the 2018 survey. This large population was considered because of the diversity in culture,

education, and health indices. The sampling frame used for the 2018 NDHS was the National Population and Housing Census of the Federal Republic of Nigeria (NPHC), which was conducted in 2006 by the National Population Commission. Administratively, Nigeria is divided into states. Each state is subdivided into local government areas (LGAs), and each LGA is divided into wards. In addition to these administrative units, during the 2006 NPHC each locality was subdivided into convenient areas called Census Enumeration Areas (EAs). The primary sampling unit (PSU), referred to as a cluster for the 2018 NDHS, is defined based on EAs from the 2006 EA census frame.

Preparatory to the sample selection, all localities were classified separately into urban and rural areas based on predetermined minimum sizes of urban areas (cut-off points). This was consistent with the official definition in 2017 which requires any locality with more than a minimum population size of 20,000 to be regarded as urban. The sample for the 2018 NDHS was a stratified sample selected in two stages. Stratification was achieved by separating each of the 36 states and the Federal Capital Territory into urban and rural areas. In total, 74 sampling strata were identified. Samples were selected independently in every stratum via a two-stage selection. Implicit stratifications were achieved at each of the lower administrative levels by sorting the sampling frame before sample selection according to administrative order and by using a probability proportional to size selection during the first sampling stage. All pregnancies that resulted in live birth within the study time frame of 2015 in Nigeria in the survey were considered.

The fieldwork for the 2018 NDHS was launched on 14 August 2018 in the clusters in the six zonal take-off centres. Thirty-seven teams, each consisting of one supervisor, one field editor, two male interviewers, three female interviewers, one lab scientist and one nurse, were assigned across the different clusters in the zones. The teams were closely monitored by the state coordinators and the quality controllers. After completion of the fieldwork in the zonal take-off centres in the first week, all the teams were brought back to the zonal office for a review session where they had an opportunity to clarify any questions they had. The teams were then dispatched to their respective states. Data collection lasted until 29 December 2018. The fieldwork in some states took longer than expected due to the security situation. The needed information including age, state, educational status, attending HCW and place of birth were extracted from the 2018 NDHS. Relevant data on new born and child health status were also extracted as secondary data.

The ethical approval was secured from the Nigeria Health Ethical Review Committee (NHREC) by the Nigeria Population Commission before the conduct of NDHS 2018. Since there were no direct patient contact and the data obtained would not have any information that could be linked directly to a particular patient, signed consent forms from the patients would not be needed.

Results

Table 4: Place of delivery (Institutional Delivery)

Maternal Educational Status	No Education	Primary	Secondary
Total No of women	6,277	2,055	5,772
% of Women who Delivered in	15.40545	42.18978	68.19127

health Facility			
Standard Error	0.45565	.01.08943	.00.61302
Lower Limit 95% Confidence Interval	14.52065	40.04264	66.97214
Upper Limit 95% Confidence Interval	16.32252	44.35924	69.39199

Source: NDHS 2018

Table 5: Skilled Birth Attendant Present at Delivery

Maternal Educational Status	No Education	Primary	Secondary
Total No of women	6,277	2,055	5,772
% Delivery with SBA	14.70	42.82	71.50
Standard Error	0.45	1.09	0.59
Lower Limit 95% Confidence Interval	13.84	40.67	70.32
Upper Limit 95% Confidence Interval	15.60	45.0	72.66

Source: NDHS 2018

Table 6: Post-natal health checks for mothers

Women's Educational Status	No Education	Primary	Secondary
Total No of women	5,786	1,877	5,271
% of women who had Post Natal Care	19.17	44.11	65.07
Standard Error	0.51	1.15	0.66
Lower Limit 95% Confidence Interval	18.16	41.85	63.77
Upper Limit 95% Confidence Interval	20.21	46.39	66.36

Source: NDHS 2018

Table 7: Post-natal health checks for Newborn

Maternal Educational Status	No Education	Primary	Secondary
Total No of Newborn	5,786	1,877	5,271
% Seeking Post Natal Care for Newborn	16.37	38.20	61.11
Standard Error	0.49	1.12	0.67
Lower Limit 95% Confidence Interval	15.42	35.99	59.78
Upper Limit 95% Confidence Interval	17.35	40.44	62.43

Source: NDHS, 2018

Table 8: Percentage of Under 5 who had symptoms of Acute Respiratory Infection (ARI) in the 2 weeks preceding the survey

Maternal Educational Status	No Education	Primary	Secondary

Total No of women	436	152	226
% with ARI 2 weeks Preceding Survey	71.10	70.39	83.19
Standard Error	2.17	3.70	2.49
Lower Limit 95% Confidence Interval	66.60	62.46	77.66
Upper Limit 95% Confidence Interval	75.31	77.52	87.82

Source: NDHS, 2018.

Among children under age 5, percentage who had symptoms of acute respiratory infection (ARI) in the 2 weeks preceding the survey; and among children with symptoms of ARI in the 2 weeks preceding the survey, percentage for whom advice or treatment was sought same day, according to background characteristics, Nigeria DHS 2018

Table9: Percentage for whom advice or treatment was sought same day Among children with symptoms of ARI in the 2 weeks preceding the survey,

Maternal Educational Status	No Education	Primary	Secondary
Total No of women	436	152	226
% who sought Care same day	20.87	25.66	46.01
Standard Error	1.94	3.54	3.31
Lower Limit 95% Confidence Interval	17.15	18.93	39.39
Upper Limit 95% Confidence Interval	24.99	33.36	52.75

Source: NDHS, 2018

Discussion of Findings

Education remains a consistently strong and significant predictor of maternal health-care utilization when childbirth, postnatal care for mother and the newborn as well as child health care are separately considered. There is a striking disparity in the utilization of maternal-care services between the women with no education and women with at least primary school education. Only 15 percent of women with no education had institutional delivery (95% CI 14.5-16.3%), Primary school education 42.2% (95% CI 40.0-44.4%) while 68.2 percent of women with secondary (95% CI 66.9-69.4%) had institutional delivery. On the average, women who have secondary education are almost five times as likely to deliver in a health care facility compare with mothers who have no education. The proportion of women with Skilled Birth attendance at delivery increased with increasing educational achievement. Only 14.7 percent of women with no education had their delivery supervised by Skilled Birth Attendance (95% CI 13.8-15.6%), Primary 42.8% (95% CI 40.6-44.9%) and secondary 71.5% (95% CI 70.3-72.7%) as shown in Table 2 and graphically presented figure 2 above. This showed strong statistical significance between the level of maternal education and SBA at delivery. The illiterate mothers were not likely to deliver in a health facility and they were also not likely to receive skilled care during delivery. Meanwhile, some scholars have documented high

maternal morbidity and mortality among pregnant women who do not have SBA at delivery²⁷. The implication of this inequality of access to maternal health care is that the non-educated mothers are more likely to suffer from adverse effect of complications that may arise as emergency during childbirth or in the postpartum period.

The proportion of women with postnatal health check for Mothers increased with increasing maternal educational level (Table 3). No education 19.2% (95% CI 18.1-20.2%), Primary 44.1% (95% CI 41.8-46.4%), secondary 61.0% (95% CI 63.7-66.4%). Table 4 showed an obvious difference in postnatal health check between the educated and illiterate mothers for newborn. The proportion of women with postnatal health check for Newborn increased with increasing educational achievement. No education 16.4% (95% CI 15.4-17.3%), of women with no education, 38.2% (95% CI 35.9-40.4%) with Primary and 61.1% (95% CI 59.8-62.4%) with secondary education. The findings indicate strong positive correlation between the level of maternal education and uptake of postnatal health checks for newborn like what the study documented for maternal postnatal check.

There was no difference in seeking care for ARI between the "No Education" group and the "Primary School" group (Table 6). However, more of the respondents with secondary school education sought care for their Children with ARI compared to any of the other two groups. No education 71.1% (95% CI 66.6-75.3%), Primary 70.3% (95% CI 62.4-77.5%), secondary 83.1% (95% CI 77.7-87.8%). It is plausible that the more-educated mothers are more likely to recognize and report symptoms of ARI than the less-educated mothers. This is in line with a study that identified acute respiratory tract infection as one of the contributors to post neonatal mortality and especially child mortality²⁸

Conclusion

The conclusions reached in this study reinforce the need for continued investments in female education, which are indispensable for reducing maternal and newborn morbidity and mortality. The data reveal a strongly positive relationship between mother's education and utilization of maternal and newborn health services in Nigeria as enumerated below:

- i. Women who have at least primary and secondary education are more likely to deliver in health care facility under the supervision of Skilled Birth Attendants.
- ii. The literate women are also more likely to present themselves and their newborns for postnatal care; maternal level of education therefore emerges as a strong predictor of the utilization of health services.
- iii. The benefits of maternal education extend beyond just the direct recipients of the education, children also benefit from maternal schooling as maternal education significantly

²⁷Okonofua F, Ntoimo L, Ogu R, et al. Prevalence and determinants of stillbirth in Nigerian referral hospitals: a multicentre study, 19.

²⁸Sosnaud and Benjamin. 'Inequality in Infant Mortality: Cross-State Variation and Medical System Institutions'. *Social Problems* 66, No 1, (2019):Pp 108-27

reduces the risk of not accessing maternal and newborn health services.

Arising from the conclusion, therefore, more attention should be given to girl-child education as a strong social determinant of health when devising strategies to reduce maternal mortality and to achieve universal maternal and newborn health in the national strategies for achieving SDGs 3, 4 and 5.

Implications for social work practice

It has been shown that the higher the mother's level of education the better the health seeking behaviour and pregnancy outcome.

- i. At the Public policy level, social workers should ensure more attention is given to girl-child/maternal education as a social determinant of health when policy makers are devising strategies to reduce maternal and child mortality.
- ii. Social workers should carry out advocacy to Federal and state governments for inclusion of funding education as a public good, investing in better monitoring, strengthening, ownership and coordination at the country level to ensure inclusive and equitable access to education.