# Geographical Disparities in Digital Access and its Association with Contraceptive Knowledge and Use among Women of Reproductive Ages in Nigeria.

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## Extended abstract

**Background:** The use of modern contraceptive method has increased globally though there is uneven progress as 1 in 10 women of reproductive age still have unmet need for family planning (UN DESA, 2020). Unmet need for family planning is highest in Africa though unevenly distributed across the countries (USAID, 2014). Prevalence of unmet need for family planning among married women alone in sub-Saharan Africa is estimated to be 23.70% (Teshale, 2022). Women in many societies are disproportionately burdened with the responsibility of family planning, yet many of them lack the resources to make informed decisions. The unmet need for family planning prevalent among many women has been associated with their socio demographic characteristics alongside community level factors such as women age, level of education, age at cohabitation, place of residence, community literacy and geographic regions. Little attention has been given to influence of prevailing modern technologies on issues around modern contraceptive usage and knowledge. There is evidence that effective use of digital tools can enhance women's health generally and decrease preventable maternal deaths(Mlambo et al., 2022). This is because technological devices can provide needed health information and services in locations where health infrastructure and resources are often limited (Mlambo et al., 2022). Bridging unmet need for planning gap through applicability of digital tools will not only be a matter of technological inclusion but a critical step towards empowering women to take control of their reproductive health choices. **Objective:** This study examined the relationship between access to digital tools/platforms and contraceptive knowledge and use among women of childbearing ages. **Method:** This study used data from 2018 Nigeria demographic and health survey (NDHS). A total weighted sample of 41,821 women of reproductive age (15-49) were used for this study. Descriptive statistics and map were used to show women's access to digital tools/platforms, their level of knowledge and use of contraceptives across the six geopolitical zones of the country. A Structural Equation Model (SEM) was used to establish a relationship between access to digital tools/platforms and knowledge, use of contraceptives and preferred modern method of contraceptives.

Model formulation: $Y = \ Dependent\ Variable, X = Independent\ Variable$

$Y = (y_1, y_2, y_3)$ and $X = (x_1, x_2, x_3, x_4)$

Where $y_1$=knowledge of contraceptives , $y_2$= use of contraceptives, and $y_3$ = preferred modern method of contraceptives, $x_1$ =own a phone , $x_2$ = internet use, $x_3$ = exposure to family

planning through text messages via mobile phone, $x_4$ = exposure to family planning through text messages via social media.

**Result:** Result shows that 56.3%, 36.6%, 33.1% 72.8%, 63.3%and 81.4% of the study participants in their respective geopolitical zones (North central, Northeast, Northwest, Southeast, South south and Southwest) own a mobile phone. However, less than 10 percent of these women were exposed to family planning via text messages on mobile phone. Internet usage was considerably high (34.4%) amongst the women in southwest, against those in northwest whose internet usage recorded 4.%. The general poor exposure to family planning through social media amongst the women is concerning, as the women in southeast recorded the highest access at 11.5%. Knowledge of modern contraception across the zones was more than 85%, however, more than 80% of these women do not use any of the modern contraceptive. The SEM is as stated below:

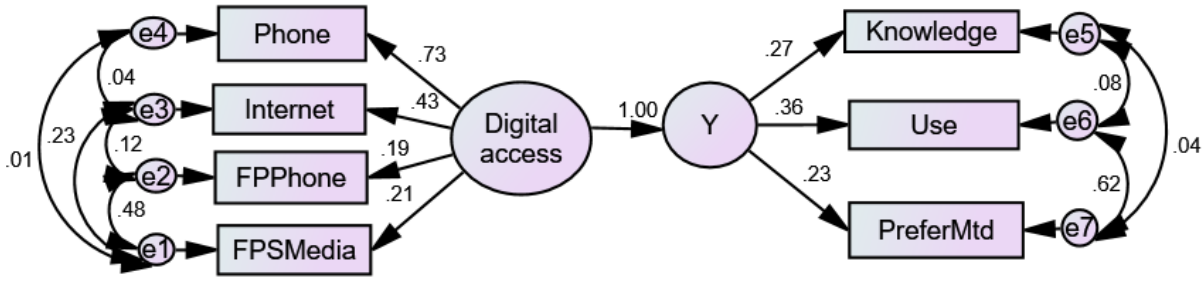


**Figure 1**: SEM of digital access and effect on knowledge, use and preferred method of contraceptives amongst women of reproductive age.

The model above best describes the relationship between access to digital tools and knowledge, use and preferred method of contraceptives amongst women of reproductive age in Nigeria.

**Table 1: Computation of degrees of freedom (Default model)**

| | |
|---|---|
| Number of distinct sample moments: | 28 |
| Number of distinct parameters to be estimated: | 22 |
| Degrees of freedom (28 - 22): | 6 |
| Minimum was achieved<br>Chi-square = 28.087<br>Degrees of freedom = 6<br>Probability level = .000 | |

From table 1, since the df = 6 and $p - value = 0.00$**,** the hypothesized model in figure 1 is over identified as it has enough information in the observed covariance matrix to compute the chi-square goodness-of-fit statistic =28.087. This shows that the observed model is fit for making deductions and predictions concerning digital access and knowledge, use and preferred method of contraceptives.

**Table 2: Correlations belonging to variables used in the model (Group number 1 - Default model)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Y** | **<---** | **Digital_access** | **5.240** | **.350** | **14.985** | ******* | |
| **FPSMedia** | <--- | Digital_access | 1.000 | | | | |
| **FPPhone** | <--- | Digital_access | .842 | .050 | 16.994 | *** | |
| **Internet** | <--- | Digital_access | 4.127 | .228 | 18.089 | *** | |
| **Phone** | <--- | Digital_access | 8.574 | .483 | 17.759 | *** | |
| **Knowledge** | <--- | Y | 1.000 | | | | |
| **Use** | <--- | Y | 1.302 | .035 | 36.835 | *** | |
| **PreferMtd** | <--- | Y | 2.831 | .099 | 28.478 | *** | |

Table 2 highlights significant predictors of knowledge and use of contraceptive among women of reproductive age. Specifically, exposure to family planning through phone text messages, Internet use, and phone usage exhibit high significance levels, as indicated by their Critical Ratio (C.R.) values (C.R. = 16.99, p < .000; C.R. = 18.08, p < .000; C.R. = 17.75, p < .000, respectively).

**Table 3: Fit indices concerning the established model (Group number 1 - Default model)**

| **Y** | **1.000** | **.000** |
|---|---|---|
| **PreferMtd** | .227 | .227 |
| **Use** | .359 | .359 |
| **Knowledge** | .273 | .273 |
| **Phone** | .730 | .000 |
| **Internet** | .426 | .000 |
| **FPPhone** | .193 | .000 |
| **FPSMedia** | .206 | .000 |

$$Y = 1.0 + 0.73Phone + 0.42Internet + 0.19FPPhone + 0.20FPSMedia \quad (1)$$

Tables 3 indicate the positive ($\beta_1$=0.73; $\beta_2$=0.42, $\beta_3$=0.19, $\beta_4$=0.20) and significant influence of digital access, except for exposure of family planning through the social media (FPSMedia) on knowledge and use of contraceptive amongst women of reproductive ages in Nigeria. It could be deduced from equation (1) that amongst the digital access tools considered in the current study, access to mobile phone is the most significant factor to contraceptive behaviour, followed by internet access, family planning through social media, and phone texts. The findings underscore the importance of digital tools, such as mobile phones and the internet, in influencing contraceptive behaviour among this demographic group. The study recommends incorporating digital tools into family planning policies to enhance accessibility, convivence and effectiveness of modern contraception.

**References**

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