Science of Nursing and Health Practices

Science infirmière et pratiques en santé

Article court | Short article

Effects of Media Exposure on Antenatal Care Utilization Among Women Aged 15-49: Evidence from the 2016 South African Demographic and Health Survey

Effets de l'exposition aux médias sur le recours aux soins prénatals chez les femmes âgées de 15 à 49 ans : résultats tirés de l'Enquête démographique et de santé sud-africaine de 2016

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ISSN 2561-7516

INTRODUCTION

Despite global and national efforts to expand access to maternal health services, late initiation of antenatal care (ANC) remains a critical yet persistent public health concern, particularly in resource-constrained and overburdened health systems. Late ANC initiation and inadequate hospital visits substantially limit opportunities for the early detection and management of pregnancy-related complications, thereby amplifying the risk of adverse maternal outcomes, such as hypertensive disorders, severe anemia, obstetric hemorrhage, and maternal sepsis, which, in turn, elevate the risk of adverse neonatal outcomes, including preterm birth, low birth weight, stillbirth, and neonatal mortality (World Health Organization [WHO], 2018). Despite long-standing recommendations from the WHO that ANC be initiated in the first trimester and that a minimum of eight visits be completed, its utilization continues to lag across many low- and middle-income settings (WHO). Evidence from Sub-Saharan Africa reveals considerable heterogeneity in the prevalence of timely ANC initiation. For example, a recent meta-analysis by Mare et al. (2025) estimated a pooled prevalence of early ANC initiation at 46.2% across the region, highlighting persistent gaps in maternal health service uptake. Country-specific studies report comparable patterns, with early ANC initiation estimated at 41% in Eritrea (Estifanos et al., 2025), 40% in Ethiopia (Fetene et al., 2023), and as low as 36.2% in select Ethiopian settings (Abera et al., 2023). In South Africa, only 25.8% of women attended their ANC before or at 12 weeks of their pregnancy (National Institute for Communicable Diseases, 2022).

Media exposure is increasingly recognized as an important factor influencing maternal health–seeking behaviour, operating by mechanisms such as improved access to information, reinforcement of normative expectations regarding care, and facilitation of timely decision-making during pregnancy. Emerging evidence suggests that both traditional and digital media platforms function as informational intermediaries that extend women's access to maternal health knowledge beyond formal healthcare settings. For instance, Chatwin et al. (2021) illustrated how social media platforms provided ANC-related support during the COVID-19 pandemic, highlighting the adaptability of digital communication channels in contexts where health systems are constrained. Similarly, Gilano et al. (2023) report that women who engage with television and internet content at least once per week are more likely to initiate ANC early. Findings from Mbunge et al. (2023) and Acharya et al. (2015) demonstrated positive associations between regular exposure to newspapers, radio, and television and improved ANC attendance. Collectively, these studies suggest that media exposure may influence ANC utilization through pathways related to heightened awareness, increased knowledge of available services and enhanced perceptions of the benefits of timely maternal care.

Despite this growing body of evidence, there remains a notable paucity of nationally representative evidence from South Africa, a context characterized by significant healthcare workforce shortages, pronounced socioeconomic inequalities, uneven patterns of media access, and persistent disparities in maternal health service utilization. This gap limits the extent to which global findings can be meaningfully adapted into local context-specific communication strategies, highlighting the need for empirical analyses that interrogate how media exposure operates within South Africa's distinctive maternal health landscape.

To address this gap, this study draws on data from the 2016 South African Demographic and Health Survey (SADHS) (National Department of Health [NdoH] et al., 2019) aiming to examine the associations between media consumption and ANC utilization. Although associative analyses do not establish causality, they provide valuable descriptive insights into patterns of information exposure and health-seeking behaviour. Such evidence can support problem identification, guide targeting of communication efforts, and inform preliminary resource prioritization, particularly in resource-constrained health systems where primary care facilities are frequently overburdened.

By analyzing these relationships, the study contributes evidence that can inform the design of context-appropriate communication approaches and highlights areas where further causal or experimental research is warranted.

METHOD

This study utilized secondary data from the SADHS 2016 (NdoH et al., 2019), a nationally representative survey designed to monitor population and health indicators. The SADHS employed a stratified two-stage sampling design. In the first stage, primary sampling units were selected using probability proportional to size, followed by systematic selection of dwelling units in the second stage. This approach ensured representation across rural and urban areas in all nine provinces of South Africa. Of the 15,292 households surveyed, 8,514 women aged 15-49 were interviewed. For the present analysis, the sample was restricted to women who had a live birth within the 5 years preceding the survey and who had complete information on the timing and frequency of ANC visits. After applying these criteria, only respondents with complete ANC-related data were retained, yielding a final analytical sample of 2,923 women.

Variables extracted encompassed demographic and socioeconomic characteristics such as age, marital status, education, employment, wealth index, and type of residence, alongside media exposure indicators, capturing the frequency of reading newspapers, listening to radio, watching television, and internet use. Data were accessed via DataFirst repository and analyzed using STATA 16.1. Two primary outcomes were assessed: early ANC initiation (within 12 weeks of gestation) and completion of four or more ANC visits.

Descriptive statistics summarized ANC patterns, while chi-square tests evaluated associations between ANC utilization and media, with significance set at $p < 0.05$. Factors explaining ANC timing and frequency were identified through univariate and multivariate logistic regression. Variables with $p < 0.25$ in univariate analyses were retained for multivariate modeling in accordance with Hosmer et al. (2013) recommendations.

RESULTS

DEMOGRAPHIC CHARACTERISTICS

Participants had a mean age of 28.8±6.8, with about one-third (n=796; 27.2%) in the 25-29 age group. Slightly over half of the participants (n=1,538; 52.6%) resided in urban areas, and the majority (n=2,328; 79.6%) completed secondary education. Concerning media consumption, 34% (n=994) reported frequent newspaper readings, 50.6% (n=1,479) listened to radio, 70.9% (n=2,074) watched television, and 28.1% (n=822) used the internet regularly. Table 1 summarizes the socio-demographic, economic, and media consumption of the study population.

PREVALENCE OF TIMING OF FIRST ANTENATAL CARE AND FREQUENCY OF ANTENATAL CARE VISITS

Table 2 shows that the prevalence of early initiation of first antenatal care was 22.9% (n=669), with a mean gestational age at first visit of 3.7±1.7 months (range: 0 – 10) for the first antenatal checkup. Concerning the frequency of antenatal care visits, 18.5% (n=542) had at least eight visits; with a mean of 5.8±2.5 visits (range: 1 – 20).

ASSOCIATION BETWEEN MEDIA EXPOSURE AND ANTENATAL CARE UTILIZATION

While all forms of exposure to all media types were associated with the timing of the first ANC visit in the bivariate analysis, the multivariate analysis showed that only radio listening and internet use remained significantly associated with early ANC initiation. Women who listened less than once a week were more likely to initiate their first ANC early than those who did not listen to the radio at all (AOR = 1.36; CI: 1.01 – 1.82). Similarly, women who used the internet almost every day had higher odds of early ANC initiation compared with those who did not use the internet at all (AOR = 1.34; 95% CI: 1.09 – 1.65). Regarding the frequency of ANC visits, all forms of media exposure were associated with attendance at more than eight ANC visits in the bivariate analyses.

Table 1

Socio-demographic, Economic, Media consumption, and internet Usage: Portrait of the Studied Population (n=2923)

Variables		n (%)
Age		Range: 15 – 49
	15 – 19	197 (6.7)
	20 – 24	688 (23.5)
	25 – 29	796 (27.2)
	30 – 34	623 (21.3)
	35 – 39	377 (12.9)
	40 – 44	205 (7.1)
	45 – 49	37 (1.3)
Type of residence		
	Rural	1,385 (47.4)
	Urban	1,538 (52.6)
Level of education		
	No education	39 (1.4)
	Primary	258 (8.8)
	Secondary	2,328 (79.6)
	Higher	298 (10.2)
Marital status		
	Divorced	23 (0.8)
	Living with partner	465 (15.9)
	Married	700 (24.0)
	Single	1,702 (58.2)
	Widow	33 (1.1)
Employment status		
	Employed	889 (30.4)
	Unemployed	2,034 (69.6)
Wealth index		
	Lower class	1,300 (44.5)
	Middle class	654 (22.3)
	Upper class	969 (33.2)
Media consumption		
Newspaper reading		
	Not at all	1,165 (39.9)
	Less than once a week	764 (26.1)
	At least once a week	994 (34.0)
Listen to radio		
	Not at all	986 (33.7)
	Less than once a week	458 (15.7)
	At least once a week	1,479 (50.6)
Watch television		
	Not at all	593 (20.3)
	Less than once a week	256 (8.8)
	At least once a week	2,074 (70.9)

Variables	n (%)
Internet usage	
Not at all	1,732 (59.3)
Less than once a week	127 (4.3)
At least once a week	242 (8.3)
Almost everyday	822 (28.1)

Table 2

Summary of Timing and Frequency of Antenatal Care Checkup Among Participants (n=2923)

Antenatal care	
Timing of 1st antenatal care	n (%)
Early (≤ 3 months)	669 (22.9)
Late (> 3 months)	2,103 (71.9)
No antenatal care	151 (5.2)
Frequency of antenatal care visits	
Recommended (≥ 8)	542 (18.5)
Not recommended (< 8)	2,230 (76.3)
No antenatal care	151 (5.2)

Table 3

Association Between Media Exposure and Antenatal Care Utilization (Timing and Frequency): Bivariate and Multivariate Logistic Regression Results

Variables	Timing of 1st antenatal care						Frequency of antenatal care visits					
	Bivariate analysis			Multivariate analysis			Bivariate analysis			Multivariate analysis		
	OR	95%CI	p-value	OR	95%CI	p-value	OR	95%CI	p-value	OR	95%CI	p-value
Newspaper reading												
Not at all	1	1	1	1	1	1	1	1	1	1	1	1
Less than once a week	1.16	0.93 – 1.46	0.186*	0.99	0.78 – 1.26	0.945	1.19	0.94 – 1.52	0.154*	0.96	0.80 – 1.34	0.803
At least once a week	1.56	1.27 – 1.91	< 0.001*	1.26	1.00 – 1.58	0.054	1.54	1.23 – 1.91	< 0.001*	0.76	0.87 – 1.43	0.398
Listen to radio												
Not at all	1	1	1	1	1	1	1	1	1	1	1	1
Less than once a week	1.44	1.10 – 1.89	0.008*	1.36	1.01 – 1.82	0.040**	1.25	0.92 – 1.70	0.148*	1.54	0.88 – 1.69	0.243
At least once a week	1.46	1.20 – 1.78	< 0.001*	1.21	0.96 – 1.51	0.100	1.68	1.35 – 2.09	< 0.001*	1.41	1.11 – 1.80	0.005**
Watch television												
Not at all	1	1	1	1	1	1	1	1	1	1	1	1
Less than once a week	1.28	0.89 – 1.85	0.184*	1.06	0.72 – 1.57	0.757	0.97	0.62 – 1.50	0.882	0.88	0.52 – 1.31	0.424
At least once a week	1.49	1.18 – 1.88	0.001*	1.18	0.91 – 1.53	0.212	1.68	1.29 – 2.18	< 0.001*	1.72	0.97 – 1.72	0.081
Internet usage												
Not at all	1	1	1	1	1	1	1	1	1	1	1	1
Less than once a week	1.46	0.97 – 2.19	0.071*	1.33	0.88 – 2.01	0.171	1.63	1.07 – 2.50	0.024*	1.57	0.97 – 2.31	0.067
At least once a week	1.37	1.00 – 1.87	0.052*	1.24	0.90 – 1.71	0.186	1.22	0.87 – 1.73	0.253	1.00	0.77 – 1.57	0.595
Almost everyday	1.54	1.27 – 1.87	< 0.001*	1.34	1.09 – 1.65	0.006**	1.60	1.30 – 1.97	< 0.001*	1.37	1.09 – 1.71	0.006**

Notes. CI: Confidence Interval; OR: Odd ratios; *Statistical significance *p*-value < 0.25; **Statistical significance *p*-value < 0.05.

However, in the adjusted model, only radio listening and internet use remained significantly associated with this outcome. Women who listened to the radio at least once a week had higher odds of attending more than eight ANC visits (AOR = 1.41; CI: 1.11 – 1.80) than those who did not use the internet. Similarly, women who used the internet almost every day were more likely to attend more than eight antenatal visits (AOR = 1.37; CI: 1.09 – 1.71). Neither newspaper reading nor television viewing was significantly associated with either ANC utilization outcome (Table 3).

DISCUSSION

The present study examined the association between media exposure and ANC utilization, including the timing of the first ANC visit and the frequency of ANC attendance among women aged 15-49 in South Africa.

Among the four media types assessed, only radio listening and internet use remained independently associated with both early ANC initiation and attending at least eight visits in the adjusted model.

Previous studies have similarly reported associations between media exposure and ANC utilization. Gilano et al. (2023) found that more frequent internet use was associated with early ANC initiation, while Pickard et al. (2024) reported similar findings on the relationship between internet usage and timely receipt of ANC services. Regarding radio exposure, Acharya et al. (2015) observed that women who listened to radio were more likely to attend their ANC visits. Other studies have also identified associations between radio listening and optimal ANC utilization (Mbunge et al. 2023; Wang et al. 2021). However, comparisons across studies should be made cautiously, as variations in study populations, media exposure measures, healthcare contexts, and analytical approaches may influence observed associations.

Importantly, the observational nature of this study, as well as previous research in this area, do not allow causal conclusions regarding the effect of media exposure on ANC behaviours. Moreover, the measurement of media exposure was limited to frequency of use and did not capture the content, quality, reliability or maternal health relevance of the information accessed. Consequently, media exposure should not be interpreted as a direct indicator of exposure to accurate or actionable maternal health messages. Rather, it may represent a broader pattern of information access and social advantage.

The association between internet use and ANC utilization should particularly be considered in light of existing digital inequalities. Previous evidence indicates pronounced disparities in internet access according to geographical location, with pregnant women residing in urban areas being substantially more likely to engage with internet usage than those in rural settings (Wang et al., 2021). In South Africa, where urban areas generally experience greater media penetration, while many rural communities continue to face infrastructure and resource limitations (Pather & Rey-Moreno, 2018; Ngwenya et al., 2023), internet use may reflect not only access to health information but also broader socioeconomic advantages, including higher educational attainment, income, digital literacy, and improved access to healthcare services.

Similarly, the observed association between radio listening and ANC utilization should be interpreted beyond a simple communication effect. Radio remains one of the most accessible communication channels in low-resource and rural settings and can contribute to reaching populations with limited access to digital technologies (Antwi-Boateng et al., 2023; Appiah et al., 2024; Porter et al., 2020). Nevertheless, radio exposure may also be correlated with other social and contextual factors that influence healthcare-seeking behaviours. Furthermore, the lack of information regarding the type and source of radio content prevents determining whether exposure to maternal health messages specifically contributed to improved ANC utilization.

Taken together, these findings highlight that media exposure may function both as a potential pathway for disseminating maternal health information and as a marker of underlying inequalities that influence women's ability to access and use healthcare services. Therefore, interventions aiming to improve ANC utilization

through communication strategies should not rely solely on expanding media access but should be integrated within broader equity-oriented approaches addressing socioeconomic barriers, digital inclusion, health literacy, and the availability of quality maternal healthcare.

LIMITATIONS

This study has several limitations that should be considered when interpreting the findings. First, the analysis was based on secondary, cross-sectional survey data, which limits the ability to establish temporal relationships or causal associations between media exposure and ANC utilization. Although associations were identified, the temporal sequence between media exposure and ANC-seeking behaviours cannot be determined. Second, several variables, including ANC attendance and media exposure, were self-reported, which may have introduced recall bias, social desirability bias, or misclassification. In addition, the exclusion of participants with missing information on ANC-related variables may have introduced selection bias if excluded women differed systematically from those included in the analysis. Third, although the analyses adjusted for several sociodemographic characteristics, residual confounding by unmeasured individual, contextual, or health system factors cannot be excluded. Factors such as quality and availability of maternal health services, social support, health literacy, and household resources may influence both access to media and ANC utilization. Finally, the available measures of media exposure were limited to frequency of use and did not capture the type, source, or quality of information accessed. Therefore, the study could not determine whether exposure involved accurate maternal health information or misinformation, or information unrelated to ANC.

CONCLUSION

This study provides evidence of the association between media exposure, particularly through radio and internet use, and early initiation and completion of eight or more ANC visits among women aged 15-49 years in South Africa. These findings suggest that media exposure may contribute to shaping maternal health information environments and care-seeking behaviours, while also reflecting broader social and structural factors influencing access to healthcare.

From a policy perspective, media exposure may represent a valuable component of maternal health communication strategies when integrated within broader equity-oriented approaches. Future interventions should consider the accessibility, cultural relevance, and quality of health messages delivered through both traditional and digital platforms. Further research is needed to better understand the mechanisms through which media exposure influences ANC utilization and to determine how communication strategies can effectively reduce informational barriers to timely and adequate maternal care.

Authors' contribution: Conceptualization, OPM, PK, and STN; methodology, OPM, and STN; investigation, OPM, PK, and STN; writing original draft preparation, OPM; writing review and editing, OPM, PK, and STN; supervision, OPM and STN. All authors have read and agreed to the final version of the manuscript.

Acknowledgments: None.

Funding: None.

Statement of conflict of interest: The authors declare no conflict of interest.

Generative Artificial Intelligence (AI) and AI-assisted technologies statement: The authors declare that no generative AI tools and AI-assisted technologies were used in the creation of this article.

Ethical consideration: The survey protocol (2016 South African Demographic and Health Survey) was reviewed and approved by the South African Medical Research Council Ethics Committee and the Inner-City Fund Institutional Review Board. The extracted data was used as part of the Master of science in Statistics and approved by the Sefako Makgatho Health Science University Research Ethics Committee (Ref: SMUREC/S/95/2024:PG).

Reçu/Received: 9 Juin/June 2025 **Publié/Published:** 19 Août/August 2026

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