INT'L JOURNAL OF HUMANITIES, ECONOMIC DEVELOPMENT AND CONTEMPORARY STUDIES
(IJHEDCS) Online ISSN: 3115-5561 – Offline ISSN: 3115-509X
Vol. 2 *issue* 1, 2026). https://journals.iempsglobal.org/index.php/IJHEDCS

TECHNOLOGICAL INTEGRATION IN FAMILY HEALTH CARE AND IMPLICATIONS FOR HEALTH OUTCOMES AND SUSTAINABLE NATIONAL DEVELOPMENT IN OWERRI MUNICIPAL OF IMO STATE

By

Dr. Chinenyenwa Emmanuel Ezea
Department of Adult and Continuing Education
Educational Technology Unit
Michael Okpara University of Agriculture, Umudike
ezea.chinenyenwazea@mouau.edu.ng

Dr. Chibuzor Imelda Ndubuka

Department of Agricultural and Vocational Education
Michael Okpara University of Agriculture, Umudike
ndubuka.chibuzor@abiastateuniversity.edu.ng
ndubukachibuzor.i@gmail.com
08030963033

Abstract

This study investigated technological integration in family health care and its implications for health outcomes and sustainable national development in Imo State. The study adopted a descriptive survey research design and was guided by three specific purposes, three research questions, and three hypotheses. The accessible population comprised 7,890 adult family members and health care providers in Owerri Municipal, Imo State, while a sample of 253 respondents, consisting of 159 adult family members and 94 health care providers, was used. Data were collected using a structured questionnaire titled Technological Integration in Family Health Care and Sustainable National Development Questionnaire (TIFCSNDQ), which was validated by experts and yielded a reliability coefficient of 0.72 using Cronbach's alpha. Mean and standard deviation were used to answer the research questions, while independent samples t-test was used to test the hypotheses at the 0.05 level of significance. The findings revealed that digital health tools significantly improve family health outcomes through better access to health information, health monitoring, timely care, treatment adherence, and parental decision-making. The study also found that technology-based health services contribute positively to sustainable national

development by improving health standards, reducing mortality, increasing productivity, promoting economic growth, and reducing pressure on public health institutions. However, barriers such as poor internet access, irregular electricity supply, low digital literacy, lack of trust in digital platforms, and inadequate technical support hinder effective utilization. No significant difference existed between the mean ratings of health care providers and adult family members on all variables studied. The study concluded that technological integration in family health care is vital for improving health outcomes and advancing sustainable national development in Imo State. It recommended improved digital infrastructure, wider adoption of digital health services, and regular digital literacy and sensitization programmes.

Keywords: Technological Integration, Family Health care, Digital Health, Health Outcomes, Sustainable National Development.

Introduction

The family remains the most immediate and influential social environment in which health is produced, protected, and sustained. International human rights and development discourse continues to affirm that the family is "the natural and fundamental group unit of society" and to connect family-oriented policy with health, education, gender equality, and well-being (United Nations Human Rights Council, 2023, p. 1; Kaczmarska, 2025). In contemporary sociology, family is commonly defined as a socially recognized group joined by blood relations, marriage, or adoption and sustained through emotional, economic, and caregiving ties (Aurini, 2025). In practical terms, this means that many decisions that shape wellbeing such as nutrition, hygiene, maternal care, child care, medication use, care-seeking behaviour, and emotional support are first negotiated and enacted within the family. Because of this centrality, the condition of family life is closely connected to the health profile of communities and nations.

Within this broader social context, family health care is understood as a care orientation in which the family, rather than only the isolated individual, is treated as the unit of assessment and intervention. Ochs, Roper, and Schwartz (2024) explain family health nursing as caring for the family as "one client," while Robinson, Coehlo, and Smith (2022) describes family health care nursing as a theory-guided and evidence-based approach that responds to family needs across the life cycle and adapts to changes in the health system. This understanding is important because health outcomes are not determined solely by clinical treatment; they are also shaped by household relationships, caregiving roles, shared behaviours, available support, and living conditions. Thus, family health care extends beyond curative services to include health promotion, disease prevention, continuity of care, and support for self-management in everyday life.

In recent years, this family-centred view of health care has increasingly intersected with the rise of digital and technology-enabled health services. The World Health Organization (2025) states

that digital health involves the use of digital technologies to improve health and health services and notes that such tools can support more equitable and universal access to quality care while improving efficiency and sustainability. Earlier WHO guidance on digital interventions for health system strengthening also emphasized that emerging digital tools can contribute to health-system improvement when their benefits, feasibility, equity implications, and implementation risks are carefully considered (WHO, 2025). In effect, technological integration in health care now encompasses telemedicine, mobile health applications, electronic medical records, wearable monitoring devices, clinical decision-support systems, and digital communication platforms that link households with providers and services.

The relevance of this technological shift is especially visible at family level. When digital tools are properly deployed, they can reduce distance barriers, speed up access to professional advice, improve appointment keeping, support medication adherence, strengthen health education, and make monitoring of chronic conditions more continuous. Fernandes, Chaltikyan, Adib, Caton-Peters, and Novillo-Ortiz (2024) found that national digital health strategies are increasingly directed toward accessibility, quality, safety, efficiency, data systems, and interoperability, showing that technological integration is no longer viewed as an optional add-on but as a structural component of modern health-care delivery. Shaw, Abejirinde, Agarwal, Shahid, and Martin (2024) similarly argued that digital health should be understood from a health-system perspective because it can improve equitable access to needed care and influence wider service-delivery outcomes. These arguments suggest that technology in family health care is significant not only because it affects household-level experiences, but also because it contributes to how health systems function overall.

Empirical evidence increasingly supports the view that digital health tools can improve family-related health outcomes. Knop et al. (2024), in a systematic review of mHealth interventions for maternal, newborn, and child health in low- and middle-income countries, reported that mobile technologies have been used across the first 1,000 days from conception to 24 months postpartum to address major maternal and child health challenges. Ameyaw, Amoah, and Ezezika (2024), in a systematic review of systematic reviews, found that mHealth applications were most effective in maternal anxiety and depression, diabetes in pregnancy, gestational weight management, maternal health-care use, and behaviour change during pregnancy. In sub-Saharan Africa, Kachimanga et al. (2024) further showed that mHealth use by community health workers improved the use of maternal health services such as antenatal care, facility-based births, and postnatal care. Together, these studies indicate that technology-based services can improve timely care use, monitoring, education, and continuity of care in family-sensitive domains such as maternal and child health.

The evidence is not limited to maternal and child health. Kim, Park, Hwang, Moon, and Park (2025), in a systematic review and meta-analysis, found that mobile health interventions had a

positive effect on medication adherence among people living with chronic diseases. This finding is highly relevant to family health care because adherence to treatment often depends on support, reminders, and supervision within the household. In another review, Münchenberg, Yessimova, Panteli, and Kurth (2024) found that digital health interventions for informal family caregivers of people with first-episode psychosis were generally well accepted and were associated with improvements in caregiver stress, expressed emotion, and parental self-efficacy. Although some in-person interventions remained stronger in selected settings, the review still demonstrates that digital health tools can strengthen family caregiving capacity and expand support options for households managing complex health conditions.

The significance of technological integration in family health care extends beyond the household because the health of families is closely tied to broader development outcomes. Sustainable national development depends not only on economic growth, but also on the health, welfare, resilience, and productive capacity of citizens. The UNDP human development framework defines development as the expansion of the richness of human life rather than merely the expansion of the economy, while the WHO global health strategy for 2025–2028 stresses that progress toward the health-related Sustainable Development Goals requires stronger health equity and more resilient health systems. This means that family-level health improvement is not a narrow domestic matter; it is part of the infrastructure of national development itself. When families are healthier, societies benefit through improved educational participation, stronger labour productivity, reduced preventable mortality, and lower long-term pressure on health systems.

Recent scholarship reinforces this connection between digital health and national development indicators. WHO's universal health coverage framework tracks progress through service coverage and protection from financial hardship, making access, affordability, and quality of care central development concerns (WHO, 2025). Forslund, Mathieson, Djibo, Mbindyo, Lugangira, and Balasubramaniam (2024) argued that digital health can act as an enabler and accelerator of universal health coverage by closing equity gaps, strengthening primary health care, improving efficiency, and supporting more inclusive governance. The World Bank (2025) likewise maintains that health investments strengthen human capital and generate broader gains in economic growth, jobs, and social wellbeing, including opportunities linked to digital health and health-related innovation. By implication, technology-based family health services may influence national development not only through direct health outcomes, but also through their contributions to workforce stability, human capital formation, and system-wide efficiency.

Despite these opportunities, the benefits of technology in family health care remain uneven because adoption is shaped by multiple barriers. Borges do Nascimento et al. (2023), in an umbrella review of 108 reviews, found that infrastructure and technical limitations, psychological and personal barriers, and workload concerns were among the most common obstacles to digital

health use by health professionals. Adnan, Irvine, Williams, Harris, and Antonacci (2025), using the Technology Acceptance Model in a systematic review of mHealth app acceptability, found that digital literacy, trust, and app-related factors significantly influenced acceptance, in addition to perceived usefulness and ease of use. Sylla, Ismaila, and Diallo (2025) further reported that, across low- and middle-income countries, digital health has improved accessibility and equity in many settings but continues to face major constraints relating to equitable access, digital literacy, and health infrastructure. These findings are particularly relevant to family health care because families that most need affordable and timely care are often those most affected by poor connectivity, low digital competence, limited electricity, cost barriers, weak trust, and inconsistent policy support.

It is within this context that the present study is situated. Although the literature increasingly recognizes the promise of digital health for improving care access, supporting prevention, enhancing adherence, and strengthening systems, there is still a need for empirical work that connects these benefits directly to family health outcomes, national development implications, and the barriers that limit effective use in one coherent investigation. Much of the existing literature either focuses on particular tools, specific diseases, or broader health-system transformation without sufficiently integrating the family as the primary unit of care and the starting point of development outcomes. This creates a gap in knowledge regarding how technological integration in family health care is experienced, how strongly it relates to measurable health and development outcomes, and what factors constrain its effectiveness in practice. The present study therefore examines technological integration in family health care with a view to assessing its implications for health outcomes and sustainable national pldevelopment, as well as identifying the barriers that hinder its effective utilization.

Available evidence suggests that digital health tools can improve communication between families and health providers, promote early diagnosis, strengthen treatment adherence, and expand access to timely health information and services. Beyond the household, technology-based health services may also contribute to broader national development outcomes through improved population health, reduced mortality, increased productivity, and greater efficiency in health-care delivery. However, in spite of these potential benefits, many families do not fully benefit from technological innovations because of barriers such as poor infrastructure, high cost of devices and internet services, low digital literacy, cultural resistance, privacy concerns, and weak policy support.

The central problem, therefore, is that although technological integration is increasingly promoted as a strategy for strengthening family health care and supporting sustainable national development, its actual influence on family health outcomes, its contribution to national development indicators, and the barriers limiting its effective use are still not sufficiently established in many contexts. This gap in empirical understanding makes it difficult to determine the extent to which technology

is truly improving family health care and advancing sustainable national development. It is this gap that the present study seeks to fill.

The purpose of this study is to examine technological integration in family health care and the implications for health outcomes and sustainable national development. Specifically, the study sought to:

1. assess how digital health tools improve family health outcomes;
2. examine the influence of technology-based health services on national development indicators;
3. identify barriers to the effective use of technology in family health care.

The study answered the following questions:

1. How do digital health tools improve family health outcomes?
2. What influence do technology-based health services have on national development indicators?
3. What barriers hinder the effective use of technology in family health care?

H01: There is no significant difference between the mean ratings of health care providers and adult family members on how digital health tools improve family health outcomes.

H02: There is no significant difference between the mean ratings of health care providers and adult family members on the influence of technology-based health services on national development indicators.

H03: T**here is no significant difference between the mean ratings of health care providers and adult family members on the barriers to the effective use of technology in family health care.**

Methodology

The study adopted a descriptive survey research design. The design was considered suitable because it facilitated the systematic collection of data from respondents on the extent to which technological integration influences family health care, health outcomes, and sustainable national development in Imo State. The accessible population for the study consisted of 7,890 respondents, comprising adult family members and health care providers in Owerri Municipal, Imo State, who were involved in family health care and had knowledge of or experience with technology-based health services. The sample for the study comprised 253 respondents, made up of 159 adult family members and 94 health care providers. Data were collected using a 15-item structured questionnaire titled: Technological Integration in Family Health Care and Sustainable National Development Questionnaire (TIFCSNDQ), made up of three clusters, designed to assess

respondents' perceptions of the role of digital health tools in improving family health outcomes, their implications for sustainable national development, and the barriers to their effective utilization in family health care. Items were rated on a 4-point Likert scale: Very High Extent (4), High Extent (3), Low Extent (2), and Very Low Extent (1). The instrument was face- and content-validated by three experts: two from the Department of Agricultural and Vocational Education specializing in Home Economics and one from the Department of Science Education, all from Michael Okpara University of Agriculture, Umudike. The reliability of the instrument was established using Cronbach's alpha, which yielded a coefficient of 0.72, indicating that the instrument was adequately reliable for the study. Data were analyzed using mean and standard deviation to answer the research questions, while the null hypotheses were tested using independent samples t-test at the 0.05 level of significance

Results

The results are presented in tables according to the research questions and hypotheses that guided the study.

Research question 1: How do digital health tools improve family health outcomes?

Table 4.1: Mean score on the digital health tools improve family health outcomes

S/N	Digital Health Tools and Family Health Outcomes	Health Care Providers N= 94		Adult family members N= 159		Overall N = 253		
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	Decision
1	Digital health tools help families access health information more quickly.	3.63	.684	3.66	.605	3.65	.635	Agreed
2	The use of mobile health applications improves health monitoring within families.	3.42	.643	3.29	.589	3.34	.612	Agreed
3	Telemedicine services make it easier for family members to receive timely medical attention.	3.88	.528	3.87	.503	3.87	.512	Agreed
4	Digital reminders for medication and appointments improve treatment adherence in families.	3.66	.630	3.66	.605	3.66	.613	Agreed

5	Health technologies help parents make better decisions about their children's health.	3.88	.528	3.87	.503	3.87	.512	Agreed
	Cluster Mean score	**3.70**	**.602**	**3.67**	**.561**	**3.68**	**.577**	**Agreed**

Table 4.1 shows that all items on how digital health tools improve family health outcomes had mean scores above the criterion mean of 2.50 on a 4-point rating scale. The cluster mean scores were 3.70 for health care providers and 3.67 for adult family members, with an overall cluster mean of 3.68. Since the overall mean exceeded the benchmark of 2.50, the respondents agreed that digital health tools improve family health outcomes. This indicates that digital health tools enable families to access health information more quickly, improve health monitoring, facilitate timely medical attention through telemedicine, enhance adherence to medication and appointment schedules, and support parents in making informed decisions about their children's health. The cluster standard deviations of 0.602 for health care providers, 0.561 for adult family members, and 0.577 overall suggest low variability in responses, indicating relative consistency in the opinions of the respondents.

A corresponding hypothesis formulated to further address the research question is

Hypothesis 1: There is no significant difference between the mean ratings of health care providers and adult family members on how digital health tools improve family health outcomes.

Table 2: Independent Samples t-test Analysis of Mean Ratings of Health Care Providers and Adult Family Members on How Digital Health Tools Improve Family Health Outcomes

Respondent Category	N	$\bar{X}$	SD	dF	t-cal	P-value	Remarks
Health Care Providers	94	3.70	.602				
				251	.375	.726	NS
Adult family members	159	3.67	.561				

Table 2 shows that the calculated t-value was 0.375 and the p-value was 0.726. Since the p-value is greater than the 0.05 level of significance, the null hypothesis was not rejected. This indicates that there is no statistically significant difference between the mean ratings of health care providers and adult family members on how digital health tools improve family health outcomes. The finding

implies that both groups held similar views regarding the positive contribution of digital health tools to family health outcomes in Imo State.

Research question 2: What influence do technology-based health services have on national development indicators?

Table 3: Mean Scores on the Influence of Technology-Based Health Services on National Development Indicators

S/N	Technology-Based Health Services and National Development Indicators	Health Care Providers N= 94		Adult family members N= 159		Overall N = 253		
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	Decision
1	Technology-based health services contribute to improved national health standards.	2.98	1.11	3.06	.998	3.03	1.04	Agreed
2	The use of digital health systems helps reduce mortality rates in the country.	2.95	1.18	3.02	1.07	2.99	1.12	Agreed
3	Technology-based health care services improve productivity by keeping citizens healthier.	2.83	1.14	3.10	1.05	3.00	1.09	Agreed
4	Digital health services contribute to economic growth through a more efficient health sector.	3.83	1.14	2.90	1.08	3.25	1.11	Agreed
5	Technology-based health services help reduce the burden on public health institutions.	2.93	1.11	3.08	1.04	3.02	1.07	Agreed
	Cluster Mean score	**3.10**	**1.14**	**3.03**	**1.05**	**3.06**	**1.09**	**Agreed**

Table 3 shows that all the items on the influence of technology-based health services on national development indicators had mean scores above the benchmark of 2.50 on the 4-point rating scale. The cluster mean scores were **3.10** for health care providers and **3.03** for adult family members, with an overall cluster mean of **3.06.** Since the overall mean is above the criterion mean of 2.50, the respondents agreed that technology-based health services positively influence national

development indicators. This implies that technology-based health services contribute to improved national health standards, help reduce mortality rates, improve productivity by keeping citizens healthier, support economic growth through a more efficient health sector, and reduce the burden on public health institutions. The cluster standard deviations of **1.14** for health care providers**, 1.05** for adult family members, and **1.09** overall indicate that respondents' opinions were somewhat dispersed, suggesting less uniformity in responses than in Table 4.1.

A corresponding hypothesis formulated to further address the research question is

Hypothesis 2: There is no significant difference between the mean ratings of health care providers and adult family members on the influence of technology-based health services on national development indicators.

Table 4. T-test Analysis on Mean Ratings on Technology-based health services influence on national development indicators.

Respondent Category	N	$\bar{X}$	SD	df	t-cal	P-value	Remarks
Health Care Providers	94	3.10	1.14	251	0.496	0.620	NS
Adult family members	159	3.03	1.05				

Data in Table 4 show that the calculated t-value is **0.496** and the corresponding p-value is **0.620**. Since the p-value is greater than the **0.05** level of significance, the null hypothesis was **not rejected**. This means that there is **no statistically significant difference** between the mean ratings of health care providers and adult family members on the influence of technology-based health services on national development indicators. This implies that both groups shared similar perceptions regarding the contribution of technology-based health services to national development indicators in Imo State.

Research question 3: What barriers hinder the effective use of technology in family health care?

Table 5: Mean score on the barriers that hinder the effective use of technology in family health care

S/N	Barriers to Effective Technology Use in Family Health Care	Health Care Providers N= 94		Adult family members N= 159		Overall N = 253		
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	Decision
1	Poor internet access limits the use of digital health tools in family health care.	3.88	.528	3.87	.503	3.87	.512	Agreed
2	Lack of electricity supply affects the effective use of health technologies in families.	3.88	.528	3.87	.503	3.87	.512	Agreed
3	Low digital literacy among family members hinders the use of digital health services.	3.66	.630	3.66	.503	3.66	.613	Agreed
4	Lack of trust in digital health platforms reduces their acceptance among families.	2.94	1.30	2.76	1.36	2.83	1.34	Agreed
5	Poor availability of technical support reduces effective use of digital health tools in family health care.	3.89	.494	3.87	.503	3.88	.499	Agreed
	Cluster Mean score	**3.65**	**.696**	**3.61**	**.674**	**3.62**	**.695**	**Agreed**

Table 5 shows that all the items relating to barriers to the effective use of technology in family health care had mean scores above the benchmark of **2.50**. The cluster mean scores were **3.65** for health care providers, **3.61** for adult family members, and **3.62** overall. Based on the overall mean score, the respondents agreed that there are barriers hindering the effective use of technology in family health care. This implies that poor internet access, inadequate electricity supply, low digital literacy, lack of trust in digital health platforms, and poor availability of technical support constitute major barriers to the effective use of technology in family health care in Imo State. The cluster standard deviations of **0.696** for health care providers, **0.674** for adult family members, and **0.695** overall indicate that the respondents' opinions were relatively close, suggesting consistency in their responses.

A corresponding hypothesis formulated to further address the research question is

Hypothesis 3: There **is no significant difference between the mean ratings of health care providers and adult family members on the barriers to the effective use of technology in family health care.**

Table 6: T-test Analysis on Mean Ratings barriers to the effective use of technology in family health care.

Respondent Category	N	$\bar{X}$	SD	df	t-cal	P-value	Remarks
Health Care Providers	94	3.65	0.696	251	0.451	0.653	NS
Adult family members	159	3.61	0.674				

Data in the table 6 show that the calculated t-value is **0.451** and the corresponding p-value is **0.653**. Since the p-value is greater than the **0.05** level of significance, the null hypothesis was **not rejected.** This means that there is **no statistically significant difference** between the mean ratings of health care providers and adult family members on the barriers that hinder the effective use of technology in family health care. This implies that both groups had similar views regarding the barriers to the effective use of technology in family health care in Imo State.

Summary of findings

The findings of the study revealed that digital health tools significantly improve family health outcomes in Imo State. Respondents agreed that digital health tools enhance quick access to health information, improve health monitoring, facilitate timely medical attention, strengthen treatment adherence, and support better parental health decision-making. The hypothesis tested further showed that there was no statistically significant difference between the mean ratings of health care providers and adult family members on how digital health tools improve family health outcomes.

The findings also revealed that technology-based health services positively influence national development indicators. Respondents agreed that such services contribute to improved national health standards, reduction in mortality rates, increased productivity, economic growth, and reduced burden on public health institutions. The hypothesis tested indicated that there was no statistically significant difference between the mean ratings of health care providers and adult family members on the influence of technology-based health services on national development indicators.

The study further revealed that poor internet access, irregular electricity supply, low digital literacy, lack of trust in digital health platforms, and inadequate technical support are major barriers to the effective use of technology in family health care. The hypothesis tested showed that there

was no statistically significant difference between the mean ratings of health care providers and adult family members on these barriers.

Discussion of Finding

The discussion of findings was carried out sequentially based on the research questions and hypotheses that guided the study.

Digital health tools improve family health outcomes;

The finding that digital health tools improve family health outcomes suggests that technology is becoming an important support mechanism in family-centred care. Respondents' agreement that digital tools improve access to health information, monitoring, timely care, and treatment adherence is consistent with recent empirical evidence. Knop et al. (2024) found that mHealth interventions were used across maternal, newborn, and child health pathways in low- and middle-income countries and supported service use and continuity of care, while Ameyaw, Amoah, and Ezezika (2024) reported effectiveness of mHealth interventions in maternal health-care use, gestational health management, and behaviour change during pregnancy. Kim et al. also found that mobile health interventions had a positive effect on medication adherence among people living with chronic diseases. These studies support the present finding that digital tools can strengthen preventive care, disease monitoring, and adherence within the family setting.

Influence of technology-based health services on national development indicators;

The finding that technology-based health services positively influence national development indicators shows that the benefits of digital health extend beyond individual families to wider social and economic outcomes. This agrees with the position that digital health should be considered from a health-system perspective because it can improve equitable access to needed care and shape broader service-delivery outcomes. It also aligns with evidence that digital transformation can accelerate universal health coverage by strengthening primary health care, improving efficiency, and helping close equity gaps. In the same vein, the World Bank (2025) links health investments, including digital health, with stronger human capital, job creation, and economic growth. The implication of the present finding is that better family access to technology-enabled care may cumulatively contribute to healthier populations, stronger productivity, and more sustainable national development.

Barriers to the effective use of technology in family health care.

The finding that there are substantial barriers to the effective use of technology in family health care is also in line with current scholarship. Borges do Nascimento et al. (2023) identified infrastructure and technical problems, psychological and personal barriers, and workload-related

concerns as major obstacles to digital health uptake among health professionals. Adnan et al. further found that trust, digital literacy, and app-related factors significantly shape acceptance of mobile health applications, alongside perceived usefulness and ease of use. At a broader systems level, Sylla, Ismaila, and Diallo (2025) concluded that although digital health has improved accessibility in many low- and middle-income settings, equitable access, digital literacy, and health infrastructure remain persistent challenges. These studies reinforce the present finding that poor connectivity, weak power supply, low digital competence, trust concerns, and inadequate support structures can limit the benefits of technological integration in family health care.

The absence of significant differences between the mean ratings of health care providers and adult family members across the three hypotheses indicates convergence in perception between both respondent groups. This suggests that both service providers and service users recognize the same broad realities: digital tools are beneficial to family health, technology-based services can support wider development outcomes, and serious barriers still limit effective use. This shared perception strengthens the credibility of the findings and suggests that interventions aimed at improving technological integration in family health care may receive support from both groups.

Conclusion

The study concluded that technological integration in family health care has meaningful implications for health outcomes and sustainable national development in Imo State. Digital health tools improve access to health information, strengthen monitoring and treatment adherence, and support timely health-care delivery within families. Technology-based health services also have wider developmental value because they contribute to improved health standards, reduced system burden, and stronger national productivity. However, the full benefits of these technologies are constrained by barriers such as poor internet access, inadequate electricity supply, low digital literacy, trust concerns, and poor technical support. Overall, the study establishes that technological integration is a promising strategy for strengthening family health care, but its impact depends on deliberate investment, accessible infrastructure, capacity building, and supportive implementation systems.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Government and health authorities should improve digital infrastructure, especially reliable internet connectivity and electricity supply, to enhance the effective use of technology in family health care.
2. Health institutions should strive to expand the use of digital health services such as telemedicine, mobile health applications, electronic reminders, and remote monitoring

tools to improve family health outcomes and support national development.in all medical centres.

3. Regular training and public sensitization programmes should be organized for health care providers and family members to improve digital literacy, build trust in digital health platforms, and reduce barriers to the effective use of technology in family health care.

REFERENCES

Adnan, A., Irvine, R. E., Williams, A., Harris, M., & Antonacci, G. (2025). *Improving acceptability of mHealth apps—The use of the Technology Acceptance Model to assess the acceptability of mHealth apps: Systematic review*. *Journal of Medical Internet Research, 27*, e66432.

Ameyaw, E. K., Amoah, P. A., & Ezezika, O. (2024). *Effectiveness of mHealth apps for maternal health care delivery: Systematic review of systematic reviews*. *Journal of Medical Internet Research, 26*, e49510.

Aurini, J. (2025). *7.1 What is marriage? What is a family?* In *Introduction to sociology*. eCampusOntario Pressbooks.

Borges do Nascimento, I. J., Abdulazeem, H., Vasanthan, L. T., Martinez, E. Z., Zucoloto, M. L., Østengaard, L., Azzopardi-Muscat, N., Zapata, T., & Novillo-Ortiz, D. (2023). *Barriers and facilitators to utilizing digital health technologies by healthcare professionals*. *npj Digital Medicine, 6*, 161.

Encyclopaedia Britannica. (2026, January 16). *Family*.

Fernandes, F. A., Chaltikyan, G., Adib, K., Caton-Peters, H., & Novillo-Ortiz, D. (2024). *The role of governance in the digital transformation of healthcare: Results of a survey in the WHO Europe Region*. *International Journal of Medical Informatics, 189*, 105510.

Forslund, M., Mathieson, K., Djibo, Y., Mbindyo, C., Lugangira, N., & Balasubramaniam, P. (2024). *Strengthening the evidence base on the use of digital health technologies to accelerate progress towards universal health coverage*. *Oxford Open Digital Health, 2*, oqae033.

Kachimanga, C., Zaniku, H. R., Divala, T. H., Ket, J. C. F., Mukherjee, J. S., Palazuelos, D., Kulinkina, A. V., Abejirinde, I.-O. O., & van den Akker, T. (2024). *Evaluating the adoption*

of mHealth technologies by community health workers to improve the use of maternal health services in sub-Saharan Africa: Systematic review. *JMIR mHealth and uHealth, 12*, e55819.

Kaczmarska, R. (2025, June). *UN DESA policy brief no. 176: Family-oriented policies and programmes in voluntary national reviews (2020–2024).* United Nations Department of Economic and Social Affairs.

Kim, S. K., Park, S. Y., Hwang, H. R., Moon, S. H., & Park, J. W. (2025). *Effectiveness of mobile health intervention in medication adherence: A systematic review and meta-analysis*. *Journal of Medical Systems, 49*, 13.

Knop, M. R., Nagashima-Hayashi, M., Lin, R., Saing, C. H., Ung, M., Oy, S., Yam, E. L. Y., Zahari, M., & Yi, S. (2024). *Impact of mHealth interventions on maternal, newborn, and child health from conception to 24 months postpartum in low- and middle-income countries: A systematic review*. *BMC Medicine, 22*, 196.

Münchenberg, P., Yessimova, D., Panteli, D., & Kurth, T. (2024). *Digital health interventions for informal family caregivers of people with first-episode psychosis: Systematic review on user experience and effectiveness*. *JMIR Mental Health, 11*, e63743.

Ochs, J., Roper, S. L., & Schwartz, S. M. (2024). *Population health for nurses*. OpenStax.

Robinson, M., Coehlo, D. P., & Smith, P. S. (2022). *Family health care nursing: Theory, practice, and research* (7th ed.). F. A. Davis.

Shaw, J., Abejirinde, I.-O. O., Agarwal, P., Shahid, S., & Martin, D. (2024). *Digital health and equitable access to care*. *PLOS Digital Health, 3*(9), e0000573.

Sylla, B., Ismaila, O., & Diallo, G. (2025). *25 years of digital health toward universal health coverage in low- and middle-income countries: Rapid systematic review*. *Journal of Medical Internet Research, 27*, e59042.

United Nations Human Rights Council. (2023, October 12). *Contribution of the implementation of the objectives of the International Year of the Family and its follow-up processes in the promotion and protection of human rights* (A/HRC/RES/54/17).

World Bank. (2025). *Health, economic growth and jobs*. World Bank Group.

World Health Organization. (2019). *WHO guideline: Recommendations on digital interventions for health system strengthening*. World Health Organization.

World Health Organization. (2025). *Digital health*.

World Health Organization. (2025). *Universal health coverage (UHC), SDG target 3.8*.

United Nations Development Programme. (2024.). *Human development*. Human Development Reports.